DRAFT ENVIRONMENTAL IMPACT ASSESSMENT

AND

ENVIRONMENTAL MANAGEMENT PLAN

OF

SAND MINING PROJECT (KISHANGANJ UNIT 05 SAND GHAT) DISTRICT- KISHANGANJ

SAND BLOCK	**KISHANGANJ UNIT- 05 SAND GHAT**	
PROPOSAL NO	**SIA/BR/MIN/429835/2023**	
TOR NO	**SIA/1(a)/2423//2023**	
AREA	**Sitaljhari Sand Ghat**	**10.0 Ha**
	Sundarbari Sand Ghat	**10.0 Ha**
	Belwa Kashipur Sand Ghat	**10.0 Ha**
	Teragachh Sand Ghat	**1.0 Ha**
	Purandarpur Sand Ghat	**28.0 Ha**
	Gambhirgadh Sand Ghat	**22.0 Ha**
	Palsa Sand Ghat	**10.0 Ha**
	Total	**91.0 Ha**
PRODUCTION	**546000 CUM per annum or 1387380 TPA**	
LOCATION	**Village- Ratua, Metihara Taluka, Belwa Kashipur, Hatgaon/Kamat, Sakhuadali, Tatpaua, Palsa, Anchal– Pothia, Kishanganj Tergachh, Thakurganj, Dighalbank District – Kishanganj, Bihar**	

APPLICANT

Geeta Enterprises

Prop.- Geeta Sarswat

S/o- Ram Pratap Sharma

Add.- C-24 Narayan Vihar Colony, Bikaner, Rajasthan,

Pin Code- 334001.

PMS
PRESERVING TOMORROW

CONSULTANT

P&M Solution

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A QCI –NABET Accredited Organization

Regional Office: 201, Mangal Market, Raja Bazaar, Patna, Bihar

NABET

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ABBREVIATIONS

AAQ	Ambient Air Quality
bgl	Below Ground Level
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board
CSR	Corporate Social Responsibility
dB	Decibel
DO	Dissolved Oxygen
EAC	Expert Appraisal Committee
EIA	Environmental Impact Assessment
EMC	Environmental Management Cell
EMP	Environment Management Plan
EPA	The Environment Protection Act
GLC	Ground Level Concentration
Ha	Hectare
Ham	Hectare Meter
HFL	High Flood Level
KLD	Kilo litre Per Day
Km	Kilo Meter
Leq	Equivalent Noise Level
LFL	Low Flood Level
LOS	Level of Service
MoEF	Ministry of Environment and Forest & Climate Change
NABET	National Accreditation Board for Education and Training
NGO	Non Governmental Organisation
NH	National Highway
NOC	No Objection Certificate
OSHA	Occupational Safety and Health Administration
PCU	Passenger Car Unit
PM	Particulate Matter
PUC	Pollution Under Control
QCI	Quality Council of India
R & R	Rehabilitation & Resettlement
RBM	River Bed Material
RL	Reduced Level
SEAC	State Expert Appraisal Committee
SH	State Highway
SPCB	State Pollution Control Board
T/cum	Tons Per Cubic Meter
TKN	Total Kjeldahl Nitrogen
TOR	Term of Reference
TPA	Tonnes Per Annum
UNFC	United Nations Framework Classification
VWG	Village Working Group

1.0 PURPOSE OF THE REPORT

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

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

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

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

Environmental Impact Assessment report is prepared to comply with the Terms of Reference (TOR)

received from SEIAA, Bihar under EIA notification of the MoEF & CC dated 14th September, 2006 and its subsequent amendment there-off and also the EIA Guidance Manual for Mining of Minerals of MoEF & CC, Govt. of India, for seeking environmental clearance for mining of Sand in the applied mining lease area.

1.1 IDENTIFICATION OF PROJECT, PROJECT PROPONENT

The Proposed Sand Mining Project is located on (Kishanganj Unit- 05 Sand Ghat) Sitaljhari Sand Ghat at Vill- Ratua Anchal Pothia, Sundarbari Sand Ghat at Vill.- Metihara Taluka, Anchal & Dist.- Kishanganj , Belwa Kashipur Sand Ghat at Vill.- Belwa Kashipur, Anchal & Dist.-Kishanganj , Teragachh Sand Ghat at Vill.- Hatgaon/Kamat , Anchal- Teragachh. Dist.- Kishanganj , Purandarpur Sand Ghat at Vill, Sakhuadali, Anchal- Thakurganj , Dist.- Kishanganj, Gambhirgadh Sand Ghat Vill.- Tatpaua , Anchal: Thakurganj , Palsa Sand Ghat at Vill: Palsa, Anchal: Dighalbank, Dist: Kishanganj. Dist.- Kishanganj Bihar.

The Proposed Production is 546000 cum/year or 1387380 Tonnes per annum and Area of the project site is 91.0 ha.

As per the Director of Geology, Bihar, the modification of mining plan has been approved .As per EIA notification 2016 and subsequent amendments, the project is coming under category '**B**' (**B1**) and the lease area is more than 5.0 Ha, approved Mining Plan, Pre-feasibility Report and EMP are required for Environment Clearance in respect of the said quarry lease. Copy of letter is enclosed as **Annexure No. II.**

The proposed project is of River bed sand mining and falls under Category- "B1" as per EIA Notification 2006 and its subsequent amendments by Ministry of Environment Forests & Climate Change, GOI.

The details of the project are given below:

Name & Address of the Mine	Kishanganj Unit- 05 Sand Ghat	Sand Mining Project (Kishanganj Unit- 05 Sand Ghat) at Riverbed of Dahuk, Gauriya, Mahananda, Mechi & Kankai at District

		Kishanganj, (Bihar).
River	Dahuk, Gauriya, Mahananda, Mechi & Kankai River	
Mineral	Sand	
Area (ha.)	Kishanganj Unit- 05 Sand Ghat	Total Area - 91.0 Ha. Sitaljhari Sand Ghat – Area – 10.0 Hect. Sundarbari Sand Ghat – Area – 10.0 Hect. Belwa Kashipur Sand Ghat – Area – 10.0 Hect. Teragachh Sand Ghat – Area – 1.0 Hect. Purandarpur Sand Ghat – Area – 28.0 Hect. Gambhirgadh Sand Ghat – Area – 22.0 Hect. Palsa Sand Ghat – Area – 10.0 Hect.
Production	Kishanganj Unit- 05 Sand Ghat	546000 Cum/Year or 1387380 TPA
Postal Address	Kishanganj Unit- 05 Sand Ghat	Geeta Enterprises Prop.- Geeta Sarswat S/o- Ram Pratap Sharma Add.- C-24 Narayan Vihar Colony, Bikaner, Rajasthan, Pin Code- 334001
Status of Mine	Fresh application for Environmental Clearance.	
Project Cost	RS- 4,97,45,000/-	
CER Cost	CER cost will be 2% of the total project cost. This amount will be used for social welfare. CER COST is Rs. 4,97,45,000/-x 2% = Rs. 9,94,900/-	

1.2 BRIEF DESCRIPTION OF PROJECT

The proposed project is open cast semi-mechanized mining of sand with a proposed production of 1387380 TPA for applied lease. Detail has been given below:

The proposed project is over an area 91.0 ha. Details are summarized in Table no 1.1

As per MoEF, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as **Category 'B-1'.** The estimated project cost for the proposed project is **given below:** (including auction cost)

Table: 1.1 Project cost & Production

Sand Ghat Block	Area (Ha.)	Khata	Khesra	Thana	Production	Project Cost (Rs.)
Sitaljhari Sand Ghat	10.0	479, 476, 662. 87, 228, 663, 334, 668, 666, 641, 651,475, 468, 477, 641, 217, 197	51, 53, 54, 55, 62 to 71, 240, 241, 242, 243, 218, 219, 236, 296, 297	264	546000 CUM per annum 1387380 TPA	4,97,45,000/-
Sundarbari Sand Ghat	10.0	6, 74, 29	411, 412, 413, 490, 489	11		
Belwa Kashipur Sand Ghat	10.0	174, 170	743, 741, 1614, 2448	04		
Teragachh Sand Ghat	1.0	94, 52	514, 533, 538, 588	74		
Purandarpur Sand Ghat	28.0	412	3890, 3891, 1386	39		
Gambhirgadh Sand Ghat	22.0	396, 468, 248, 398, 194, 62, 455, 383, 364, 397, 449	1386, 1816, 1400 to 1402, 1390 to 1399,	192		

			1406			
Palsa Sand Ghat	10.0	2, 43, 51	1068, 1063, 1058, 1059	88		
Total	**91.0**				**1387380 TPA**	**4,97,45,000/-**

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

Table: 1.2 Mine lease Pillar Co-ordinates
Kishanganj Unit- 05 Sand Ghat

Co-ordinates				Ghat/ Address	River
Sitaljhari Sand Ghat	10.0	A	26°15’41.37”N 88° 5’14.10”E	Vill- Ratua Anchal Pothia, Dist - Kishanganj.	Dahuk
		B	26°15’39.26”N 88° 5’19.30”E		
		C	26°15’22.02”N 88° 5’9.62”E		
		D	26°15’24.36”N 88° 5’4.06”E		
Sundarbari Sand Ghat	10.0	A	26°12'33.72"N 87°59'50.07"E	Vill.- Metihara Taluka, Anchal & Dist:- Kishanganj.	Dahuk
		B	26°12'28.66"N 87°59'50.55"E		
		C	26°12'26.07"N 87°59'29.51"E		
		D	26°12'31.67"N 87°59'28.72"E		
Belwa Kashipur Sand Ghat	10.0	A	26°11'23.06"N 87°57'49.47"E	Vill: Belwa kashipur, Anchal & Dist: Kishanganj.	Dahuk
		B	26°11'17.72"N 87°58'15.59"E		
		C	26°11'13.72"N 87°58'14.52"E		
		D	26°11'18.88"N 87°57'48.40"E		
Teragachh Sand	1.0	A	26°23'33.31"N 87°42'40.34"E	Vill: Hatgaon/Kamat,	Gauriya

Ghat		B	26°23'34.32"N 87°42'43.19"E	Anchal- Teragachh, Dist: Kishanganj.	
		C	26°23'31.87"N 87°42'45.45"E		
		D	26°23'30.79"N 87°42'41.86"E		
Purandarpur Sand Ghat	28.0	A	26°24’51.41”N 88°10’50.78”E	Vill, Sakhuadali, Anchal- Thakurganj. Dist: Kishanganj.	Mahananda
		B	26°24'45.54"N 88°10'54.85"E		
		C	26°24'27.33"N 88°10'29.29"E		
		D	26°24'38.26"N 88°10'21.54"E		
Gambhirgadh Sand Ghat	22.0	A	26°20'25.50"N 88° 1'58.69"E	Vill.- Tatpaua , Anchal: Thakurganj, Dist: Kishanganj.	Mechi
		B	26°20'19.41"N 88° 2'3.33"E		
		C	26°20'1.38"N 88° 1'34.60"E		
		D	26°20'6.27"N 88° 1'28.92"E		
Palsa Sand Ghat	10.0	A	26°26'28.48"N 87°47'35.48"E	Vill: Palsa, Anchal: Dighalbank, Dist: Kishanganj.	Kankai
		B	26°26'26.17"N 87°47'42.84"E		
		C	26°26'12.22"N 87°47'37.58"E		
		D	26°26'14.31"N 87°47'30.07"E		

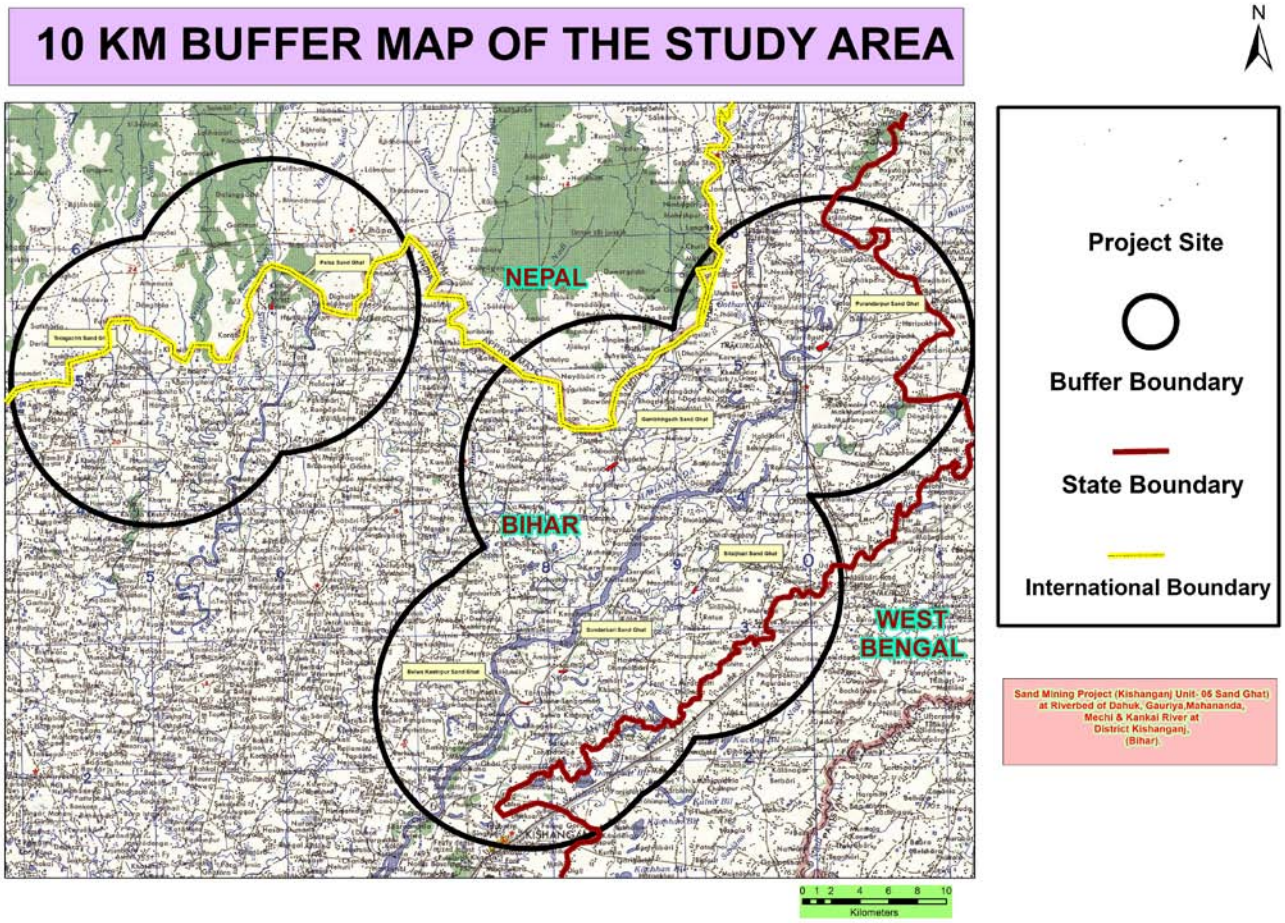

Figure 1.1, 10 km buffer map

Table: 1.3, Connectivity Details given below

Nearest Habitation/ town	**Blocks**	**Village**	**Distance (Km) Direction**
	Sitaljhari Sand Ghat	Sitaljhari	Approx. 0.90 km, towards ENE direction.
	Sundarbari Sand Ghat	Motihara	Approx. 0.70 km, towards NW direction.
	Belwa Kashipur Sand Ghat	Belwa	Approx. 0.20 km, towards N direction.
	Teragachh Sand Ghat	Kamat Hatgaon	Approx. 0.80 km, towards SW direction.
	Purandarpur	Purandarpur	Approx. 0.70 km,

	<table><tr><td>Sand Ghat</td><td></td><td>towards S direction.</td></tr><tr><td>Gambhirgadh Sand Ghat</td><td>Gambhirgadh</td><td>Approx. 0.55 km, towards N direction.</td></tr><tr><td>Palsa Sand Ghat</td><td>Kantu Basti</td><td>Approx. 0.55 km, towards E direction.</td></tr></table> \
Nearest Railway Station	Kishanganj Railway station at distance of 10.30 km in South-East from Belwa Kashipur Sand Ghat andPothia Railway station at distance of 10.50 km in North-East from Sitaljhari Sand Ghat
Nearest Airport	JPN International Airport at a distance of 277 km in SW direction from Teragachh Sand Ghat
Nearest Highway	NH 27 at distance of approx. 7 km in SE direction from Sitaljhari Sand Ghat, NH- 327 at distance of approx. 600 m in North -West from Gambhirgadh Sand Ghat and SH- 99 at distance of approx. 6 Km in SE from Palsa Sand ghat.

1.3 Details of environmental settings

Sl. No.	Particulars	Details
1	Ecological Sensitive Areas (National Park, Wildlife Sanctuaries)	There is no any Ecological Sensitive Areas Like National Park, Wildlife Sanctuaries, etc are found within 10 km of the study area.
2	Nearest water body	Project site is located on Dahuk, Gauriya, Mahananda, Mechi & Kankai river bed.
3	State & International boundary	Bihar-West Bengal State boundary at a distance of 5.20 km in ESE from Dubanochi Sand Ghat; India-Nepal International boundary at distance of approx. 3.0 km in North from Gambhirgadh Sand Ghat.
4	Seismic Zone	Zone- V *Source: BMTC*

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

Project's importance to the country and the region

Sands are ubiquitous material; available everywhere and is being used from the time immemorial for wide applications in our daily life; infrastructures, building construction, highways, roads, townships, multiplexes, foundations of buildings and industrial units etc. and is an integral part of development. Life without sand is unthinkable. Over the millennia, the weathering effect, the flow of water at high velocities in rivers and the pressure of water from the high mountainous reservoirs converted and pushed the hard ground underneath into sands, etc. which travelled as sediments with the flow. This sand got deposited along the river course wherever conditions were favorable. In the deep past this settled sand was not extracted in a quantity in which it deposited; since due to less population the requirements was not enough. As a result of continuous deposit of sand , the rivers went on changing their course, widening by itself, eroding the fields and expanding, resulting in flooding, inundation and breaking their banks, causing devastation of property and loss of life. There has been a severe impact on every aspect of the environment. The rivers thus, needed channelization and therefore, extraction of these minor minerals through mining was expedient. The haphazard mining of sands being practiced now for long, through unregulated, uncontrolled and illegal way added almost an irreversible damage to the environment, which became a cause of serious concern to everyone. Though sands are very important mineral source for development, its mining through scientific methods has also become equally imperative.

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

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

1.4 SCOPE OF THE STUDY

The project proposal was submitted to State Level Environment Impact Assessment Authority-Bihar for its appraisal. Based on which, presentation was held for Terms of Reference (TOR). Based on the data provided and presentation made, the SEIAA-Bihar has issued the Terms of Reference attached as **Annexure-1.**

Followings are the point wise compliance of the ToR provided by the SEIAA Bihar.

Table: 1.5 Point wise compliance for TOR

(ToR File No- SIA/1(a)/2423//2023)

S. No	TOR	Compliance	Reference in the 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.	This is fresh LOI, Mine is yet to be opened. It will open only after getting environmental clearance.	--
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	State Govt. has given consent for mining vide letter no. 31/khanan, Kishanganj, dated. 06.01.2023	**Annexure II, LOI**
3	All documents including approved mine plan, EIA and public hearing should be compatible with one another in terms of the mine lease	The documents including mine plan and EIA report submitted are compatible with one another w.r.t. to following information:	**Annexure- III** Mine plan All details has been

	area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.	Mining Lease Area- 91.0 Hectare Lessee: Geeta Enterprises Prop.- Geeta Sarswat S/o- Ram Pratap Sharma Add.- C-24 Narayan Vihar Colony, Bikaner, Rajasthan. Pin Code- 334001. Waste generation- No waste will be generated. Mining Method-Opencast semi-mechanized method	complied in chapter-2
4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery /toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All Corner Coordinates of mining lease area superimposed on Toposheet Map has been incorporated in EIA/EMP Report.	Refer Chapter 2 Fig: 2.1, Corner Coordinates map
5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	The land use map showing salient features of the area is given in the report. The geological map of the mine lease area is also given in the report showing geomorphology	Land-use of the study area Figure 3.1.

6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The Lease area is dry part of River bed. This is a barren land. The mining process will be done by land use policy of the State & no land diversion has been proposed.	Chapter II & III
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating processes /procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? The hierarchical system or administrative order of the company to deal with the environmental issues and for insuring compliances with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be	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.	Chapter VIII Section 8.1 Corporate Environment Policy

	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.	Issue related to mine safety has been given in of chapter 7.	
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 the 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. All the details in the EIA report are for the life of the mine period. The details of mining & production have been given in the report.	Chapter I Figure 1.1
10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass	Land use pattern of 10 km from the periphery of the lease area has been prepared and incorporated with the report. The study area lies in Dahuk, Gauriya, Mahananda, Mechi & Kankai river. There is no any Wild Life sanctuary & National Park,	Land-use of the study area Figure 3.1 , Table 3.1 10 km buffer map enclosed in Chapter I of EIA Report.

	preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	protected forest within the study area.	
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 outside the mine lease area.	
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.	---

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 recognition 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	There is no any Ecological Sensitive Areas Like National Park, Wildlife Sanctuaries, etc are found within 10 km of the study area. However, the vegetation details of the study area are incorporated with the report.	Chapter III Section 3.1.6 Biological Environment
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked	The details Impacts & there mitigation measures are given in chapter IV of EIA/EMP Report.	Chapter IV

	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 l0 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	No National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger / Elephant Reserves / (existing as well as proposed) are found within 10 km of the study area.	Chapter III Section 3.1.6 Biological Environment
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	Detailed biological study of core zone and buffer zone within 10 km radius of the periphery of the mine lease has been carried out for the project. The same has been incorporated in the report	Chapter III Section 3.1.6 Biological Environment

	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.		
19	Proximity to Areas declared as 'Critically Polluted' or the Project areas 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.	Proposed project does not come under critically polluted area.	
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	There is no R & R involved in this project.	

	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.	There is no R & R involved in this project.	

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.	Base line study was carried out for Pre Monsoon season March 2023 to May 2023 Details are provided in EIA/EMP Report. The locations of the monitoring stations were decided on the basis of prevailing 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.	Chapter III Section 3.1.2 Air Environment
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	A detailed study on Air quality modeling will be incorporated at the time of FEIA.	

	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.	The water requirement for Kishanganj Unit- 05 is 47.0 KLD for drinking, dust suppression and green belt development. A detailed water balance is being provided in the report.	Chapter –II Section 2.7.4 Water Requirement
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.	Chapter II
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 required should be provided.	The project do not consume any process water except for drinking, dust suppression & plantation. Plantation is proposed, which will increase the water holding capacity & help in recharging of	

		ground water. No artificial rainwater harvesting is proposed for the present project in lease area, however if any such project proposed by State Government PP will help out for the above.	
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".	Mining activity will be done on Dry Bed of River so there is no impact on surface water. Mining will be up to 1.0 m below ground level or above the ground water table whichever comes first. This will not intersect the ground water table.	Chapter II
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	The mining will be done only upto 1.0 m depth. The detailed impact and control measure w.r.t the quality of water in the surrounding area is discussed under Chapter 4.	

	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.	The project site lies on Dahuk, Gauriya, Mahananda, Mechi & Kankai river bed. 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 mining will be done as per the approved mining plan and 1.0 meter bgl whichever is 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 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	Plantation/afforestation will be done as per program i.e along the road sides and near civic amenities, as per mine plan. Post plantation, the area will be regularly monitored in every season for evaluation of success rate. List of Plant species selected for green belt is detailed in the EIA report. The plant species selected for green belt have a greater ecological value and are of good utility value to the local	Chapter IX Section 9.5

	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.	population. The plant species are selected by giving 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.	The projection has been done based on the mineral transportation. The details of traffic analysis are discussed in the report.	Chapter IV Section 4.6 Traffic Analysis Fig 4.2, Table 4.3(i), 4.3(ii)
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 equipments, etc. Details are given in the EIA/EMP Report.	Chapter II Section 2.12.2

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.	Conceptual plans and Sections are given in 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-4. Each labour will undergo pre-placement medical examination. Thereafter periodical heath check up will be arranged as stated in the report.	Chapter VII Section 7.2 Chapter VIII Section 8.3

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-VIII.	Chapter VII Section 7.2 Chapter VIII Section 8.3
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.	Chapter VI Section 6.4 Chapter VII Section 7.2
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.	Chapter IX

<table>
<tr><td>39</td><td>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.</td><td>This is a draft EIA report. Public hearing is yet to be conducted.</td><td>--</td></tr>
<tr><td>40</td><td>Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.</td><td>No litigation is pending against the project.</td><td></td></tr>
<tr><td>41</td><td>The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.</td><td>The capital cost & recurring cost for has been earmarked for EMP. Chapter IX
<table><tr><th>Block</th><th>Capital Cost</th><th>Recurring Cost</th></tr><tr><td>Kishanganj Unit-05</td><td>17.325 Lakh</td><td>5.5 lakh</td></tr></table></td><td>Chapter IX</td></tr>
<tr><td>42</td><td>A Disaster management Plan shall be prepared and included in the EIA/EMP Report".</td><td>A Disaster management Plan has been given in EIA report.</td><td>Chapter VII</td></tr>
<tr><td>43</td><td>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.</td><td>2% of the total cost of the project has been earmarked towards the Enterprise Social Commitment which will be used for the development of village.</td><td>Chapter VIII</td></tr>
<tr><td>44</td><td colspan="3">Besides the above, the below mentioned general points are also to be followed:-</td></tr>
</table>

a	All documents to be properly referenced with index and continuous page numberings.	All the 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.	Compiled With EIA report.	
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.	Compiled With EIA report.	
d	Where the documents provided are in a language other than English, an English translation should be provided.	Compiled With EIA report.	
e	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Compiled With EIA report.	
f	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-	Compiled With EIA report.	

	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.	Agreed	
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.	This is new case for Mining. No certified compliance is required.	

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.	Compiled With EIA report.	

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2.0 TYPE OF PROJECT

The project is proposed is for Kishanganj Unit- 05 Sand Ghat for the excavation of sand from the bed of river Dahuk, Gauriya, Mahananda, Mechi & Kankai River. The proposed project is opencast semi-mechanized/OTFM mining project.

2.1 NEED FOR THE PROJECT

The project site lies on Dahuk, Gauriya, Mahananda, Mechi & Kankai River. The river get recharged by the rain water and carries sediment consisting of sand etc during monsoon season, generally.

Sand is used widely in the construction industry. It is usually mixed with cement and other ingredients to create mortar for building. It is also used in agriculture, as sandy soils are ideal for crops such as watermelons, peaches and peanuts. Sand is also used in Aquaria as it makes a low cost aquarium base material. This project will also provide employment to local people helping them earn livelihood.

2.2 LOCATION DETAILS

The Proposed Sand Mining Project is located on (Kishanganj Unit- 05 Sand Ghat) Sitaljhari Sand Ghat at Vill- Ratua Anchal Pothia, Sundarbari Sand Ghat at Vill.- Metihara Taluka, Anchal & Dist.- Kishanganj , Belwa Kashipur Sand Ghat at Vill.- Belwa Kashipur, Anchal & Dist.-Kishanganj , Teragachh Sand Ghat at Vill.- Hatgaon/Kamat , Anchal- Teragachh. Dist.- Kishanganj , Purandarpur Sand Ghat at Vill, Sakhuadali, Anchal- Thakurganj , Dist.- Kishanganj, Gambhirgadh Sand Ghat Vill.- Tatpaua , Anchal: Thakurganj , Palsa Sand Ghat at Vill: Palsa, Anchal: Dighalbank, Dist: Kishanganj. Dist.- Kishanganj Bihar.

The Proposed Production is 546000 Cum/Year or 1387380 Tonnes per annum and Area of the project site is 91.0 ha.

As per the Director of Geology, Bihar, the modification of mining plan has been approved .As per EIA notification 2016 and subsequent amendments, the project is coming under category '**B**' (**B1**) and the lease area is more than 5.0 Ha, approved Mining Plan, Pre-

feasibility Report and EMP are required for Environment Clearance in respect of the said quarry lease. Copy of letter is enclosed as Annexure No. II.

The proposed project is of River bed sand mining and falls under Category- "B1" as per EIA Notification 2006 and its subsequent amendments by Ministry of Environment Forests & Climate Change, GOI.

Geo Coordinate of Lease Area:

Table 2.1, Mine lease Pillar Co-ordinates
Kishanganj Unit- 05 Sand Ghat

Co-ordinates				Ghat/ Address	River
Sitaljhari Sand Ghat	10.0	A	26°15'41.37"N 88° 5'14.10"E	Vill- Ratua Anchal Pothia, Dist - Kishanganj.	Dahuk
		B	26°15'39.26"N 88° 5'19.30"E		
		C	26°15'22.02"N 88° 5'9.62"E		
		D	26°15'24.36"N 88° 5'4.06"E		
Sundarbari Sand Ghat	10.0	A	26°12'33.72"N 87°59'50.07"E	Vill.- Metihara Taluka, Anchal & Dist:- Kishanganj.	Dahuk
		B	26°12'28.66"N 87°59'50.55"E		
		C	26°12'26.07"N 87°59'29.51"E		
		D	26°12'31.67"N 87°59'28.72"E		
Belwa Kashipur Sand Ghat	10.0	A	26°11'23.06"N 87°57'49.47"E	Vill: Belwa kashipur, Anchal & Dist: Kishanganj.	Dahuk
		B	26°11'17.72"N 87°58'15.59"E		
		C	26°11'13.72"N 87°58'14.52"E		
		D	26°11'18.88"N 87°57'48.40"E		
Teragachh Sand Ghat	1.0	A	26°23'33.31"N 87°42'40.34"E	Vill: Hatgaon/Kamat, Anchal- Teragachh, Dist: Kishanganj.	Gauriya
		B	26°23'34.32"N 87°42'43.19"E		
		C	26°23'31.87"N 87°42'45.45"E		
		D	26°23'30.79"N 87°42'41.86"E		

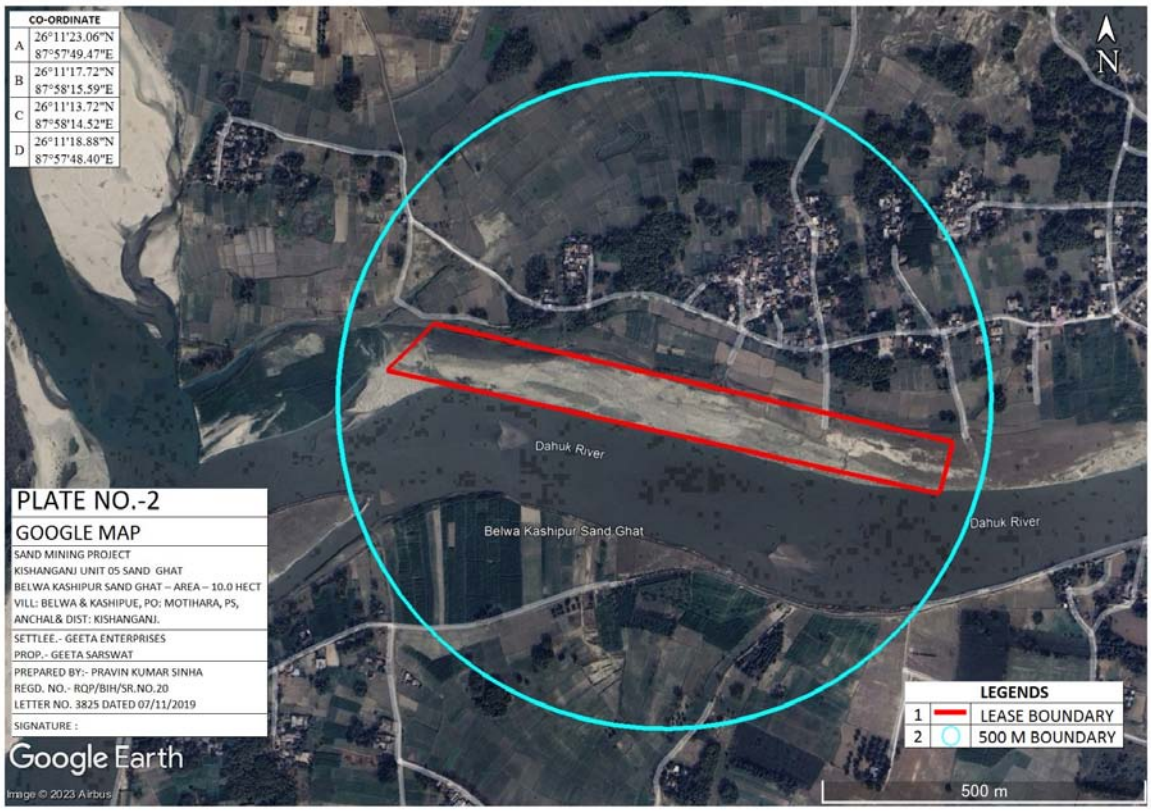
Purandarpur Sand Ghat	28.0	A	26°24’51.41”N 88°10’50.78”E	Vill, Sakhuadali, Anchal- Thakurganj. Dist: Kishanganj.	Mahananda
		B	26°24'45.54"N 88°10'54.85"E		
		C	26°24'27.33"N 88°10'29.29"E		
		D	26°24'38.26"N 88°10'21.54"E		
Gambhirgadh Sand Ghat	22.0	A	26°20'25.50"N 88° 1'58.69"E	Vill.- Tatpaua , Anchal: Thakurganj, Dist: Kishanganj.	Mechi
		B	26°20'19.41"N 88° 2'3.33"E		
		C	26°20'1.38"N 88° 1'34.60"E		
		D	26°20'6.27"N 88° 1'28.92"E		
Palsa Sand Ghat	10.0	A	26°26'28.48"N 87°47'35.48"E	Vill: Palsa, Anchal: Dighalbank, Dist: Kishanganj.	Kankai
		B	26°26'26.17"N 87°47'42.84"E		
		C	26°26'12.22"N 87°47'37.58"E		
		D	26°26'14.31"N 87°47'30.07"E		

Connectivity

Nearest Railway Station	Kishanganj Railway station at distance of 10.30 km in South-East from Belwa Kashipur Sand Ghat and Pothia Railway station at distance of 10.50 km in North-East from Sitaljhari Sand Ghat
Nearest Airport	JPN International Airport at a distance of 277 km in SW direction from Teragachh Sand Ghat
Nearest Highway	NH 27 at distance of approx. 7 km in SE direction from Sitaljhari Sand Ghat, NH- 327 at distance of approx. 600 m in North -West from Gambhirgadh Sand Ghat and SH- 99 at distance of approx. 6 Km in SE from Palsa Sand ghat.

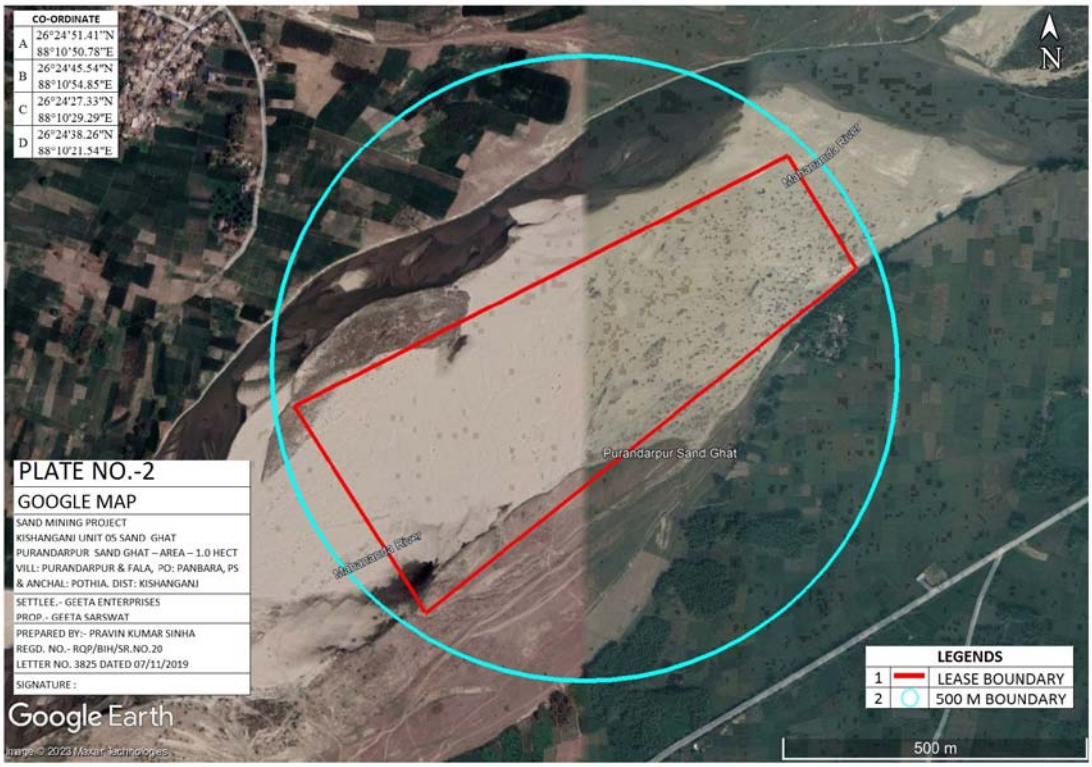
Sitaljhari Sand Ghat

Sundarbari Sand Ghat

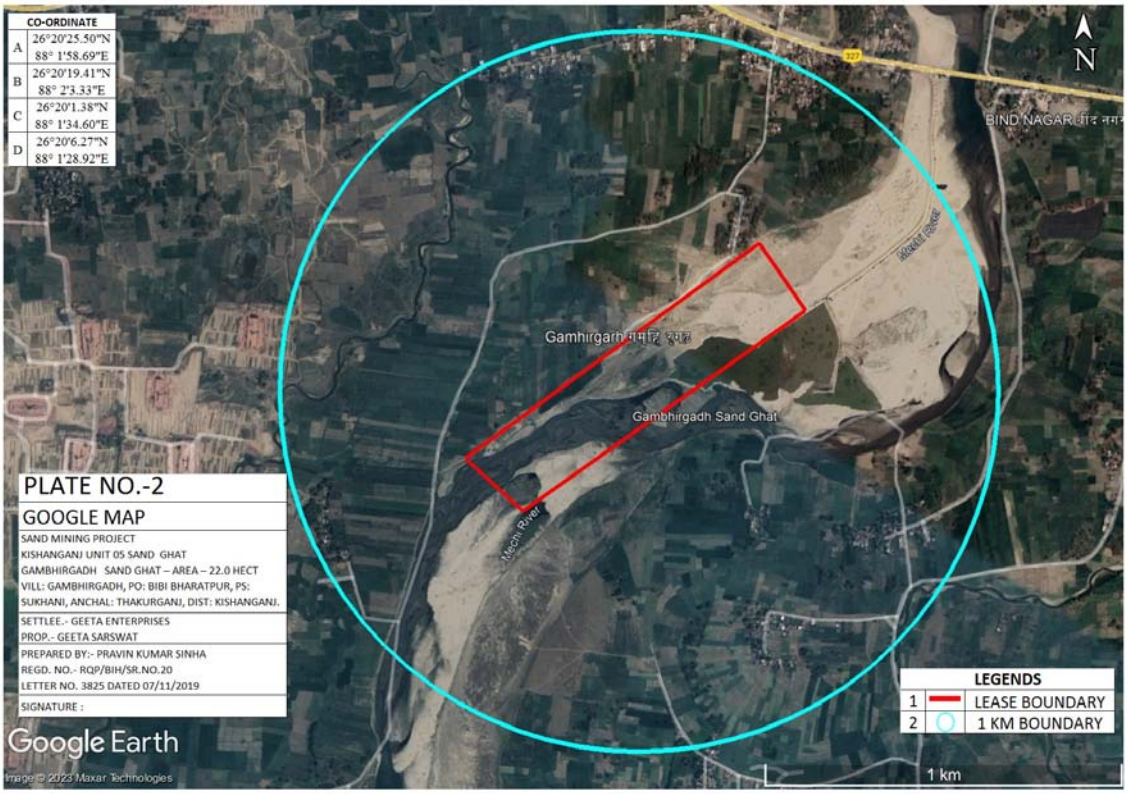


Belwa Kashipur Sand Ghat

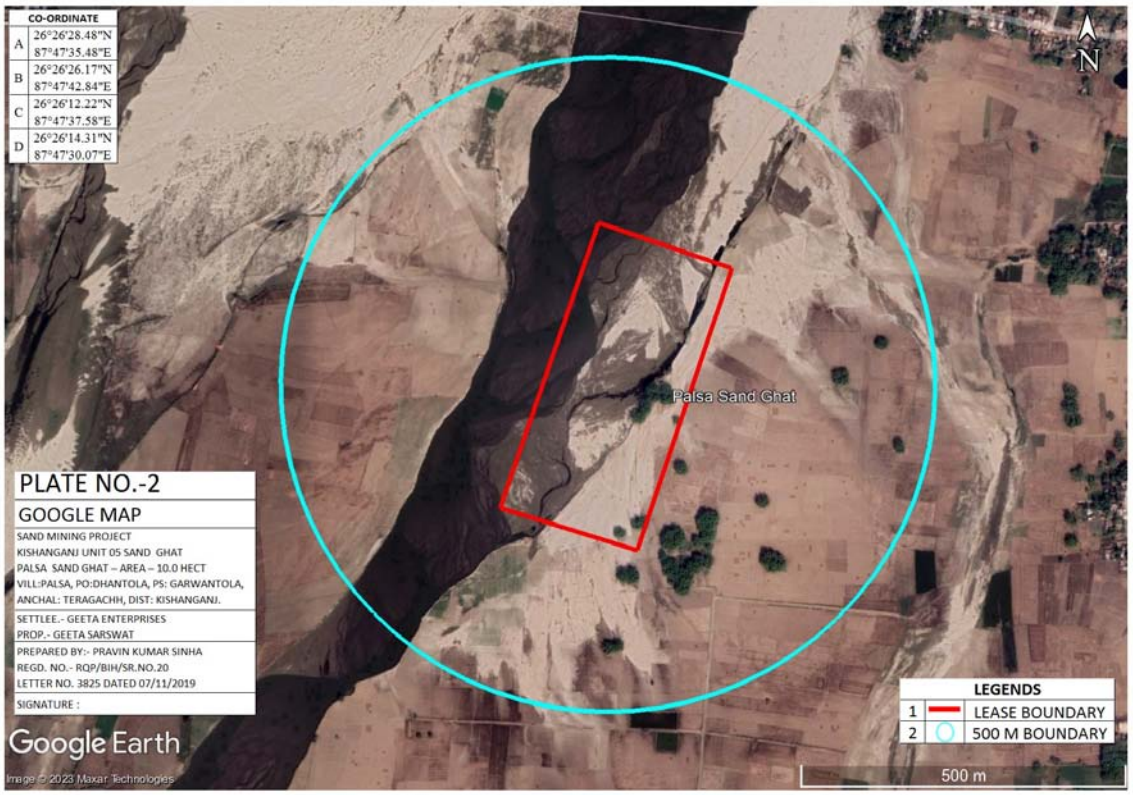
Teragachh Sand Ghat



Purandarpur Sand Ghat



Gambhirgadh Sand Ghat



Palsa Sand Ghat

Figure 2.1:- Pillar Coordinate Map

2.2.1 Lease / Block Area

The proposed project is Open Cast Semi-Mechanized Mining of Sand with a proposed production is given below in tabular form.

Sand Ghat Block	Area (Ha.)	Khata	Khesra	Thana	Production	Project Cost (Rs.)
Sitaljhari Sand Ghat	10.0	479, 476, 662. 87, 228, 663, 334, 668, 666, 641, 651,475, 468, 477, 641, 217, 197	51, 53, 54, 55, 62 to 71, 240, 241, 242, 243, 218, 219, 236, 296, 297	264	546000 CUM per annum 1387380 TPA	4,97,45,000/-
Sundarbari	10.0	6, 74, 29	411, 412, 413,	11		

Sand Ghat			490, 489			
Belwa Kashipur Sand Ghat	10.0	174, 170	743, 741, 1614, 2448	04		
Teragachh Sand Ghat	1.0	94, 52	514, 533, 538, 588	74		
Purandarpur Sand Ghat	28.0	412	3890, 3891, 1386	39		
Gambhirgadh Sand Ghat	22.0	396, 468, 248, 398, 194, 62, 455, 383, 364, 397, 449	1386, 1816, 1400 to 1402, 1390 to 1399, 1406	192		
Palsa Sand Ghat	10.0	2, 43, 51	1068, 1063, 1058, 1059	88		
Total	**91.0**				**1387380 TPA**	**4,97,45,000/-**

As per MoEF, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as Category 'B-1'. The estimated project cost for the proposed project is given in above table.

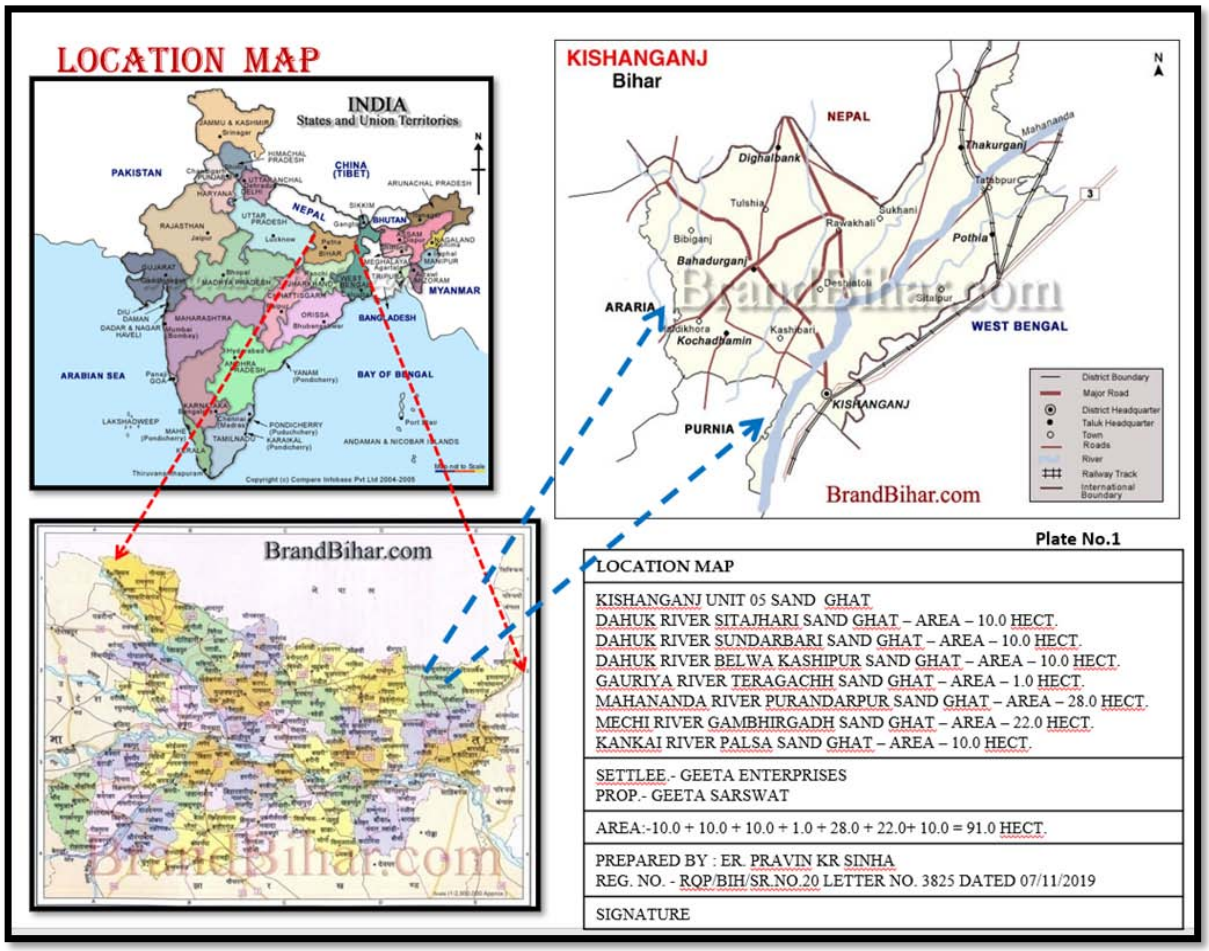


Figure 2.2:- Location map of the project site

2.3 TOPOGRAPHY & GEOLOGY

2.3.1 Topography

Kishanganj maintains wonderful topography. Most areas are plains and in few regions mineral deposits have also been found in recent past. As several ancient remains are found in this district, the region welcomes its archaeologist and geologist visitors on regular intervals. They usually research to learn more about the golden past of this region. Tourist attractions are tea gardens, a lake besides several rivers which remain notable attractions in Kishanganj District. Prominent rivers Mahananda, Kankai, Mechi, Donk, Rauta and Ramzan are key sources of irrigation water meant for agriculture in Kishanganj District. Rice, wheat, oilseeds, pulses and maize are major crop produces in the area in and around this district. Few factories too have been established in this region in the recent decades.

Source: *Mining plan*

2.3.2 GEOMORPHOLOGY

Kishanganj district is a part of the Indo-Gangetic alluvium, one of the three main physiographic divisions of India, which separates Extra-Peninsular regions on the north from the peninsular region on the south. In the district the main aquifer materials consist of fine to medium sand or fine sand mixed with silts with occasional kankar and gravels. In shallow aquifer zones the ground water is generally under water table condition whereas deeper aquifers are under semi confined to confined condition. The level plain is known to be the outcome of a granular filling of a great depression with alluvial sediments since Middle Pleistocene times. The district forming a part of the flood plains of the Ganga has a monotonously flat relief. The area under study is underlain by alluvial sediments of quaternary age. The quaternary sediments are deposited unconformable on the Archaean basement. The Main rivers Kosi and Mahananda carry a tremendous load of sediments, the soil are mostly light textured except in backwaters of river Ganga and Kosi.

Three broad soil association groups have been identified in this zone are:

1. Recent alluvial tarai soil

2. Recent alluvial non calcareous soil, and

3. Recent alluvial calcareous soil.

SOILS

The two broad soil groups are available in the district.

a) Recent Alluvium non-calcareous non-saline groups found over major part of the district. It is mostly light to medium textured and acid to neutral in nature. It also formed layered sediments having no horizontal differentiation.

b) Recent Alluvium-Tarai soils found as a small patch in the northeast corner of the district. It is mixture of highly disturbed recent alluvium along the course of river. It is light to heavy textured and poorly drained.

Source: *Mining plan*

2.3.3 REGIONAL GEOLOGY

Regional Geology

Geologically, it represents nearly two third of Bihar is under cover of Ganga basin composed of alluvium and masks the nature of basement rocks.

Table 2.2. Showing the Geological Succession and their geographic distribution

Age	Geology	Occurrences
Quaternary	Alluvial Deposits (Sand, Clay, Silt, Fragments)	North Bihar Plain & Central Bihar Plain
Tertiary	Sand Stones & Clay Stones	North Champaran Hills
Gondwana	Coal Measures, Forming a series of Small outlier basins	Banka District
Vindhyans	Sandstones, Shales, Limestones, etc.	Parts of Bahbhua and Rohtas dist
Satpura	Schist, Phyllite, Quartzite	Part of Aurangabad, Gaya, Nawada, Nalanda, Sheikhpura and Munger District
Proterozoic	Mica Schist, amphibolites, quartzite, granite, dolerite and pegmatite	Nawada, Jamui and Banka
Archaean	Gneisses, Granites, Schists, Phyllites, quartzite, amphibolites & intrusive all metamorphosed sedimentary and igneous rocks	Part of Aurangabad, Gaya, Nawada, Jamui, Banka and Bhagalpur

2.3.4 LOCAL GEOLOGY OF THE AREA

The area forms a part of the recent formation having alluvial soil deposit which is Quaternary Alluvial Deposit. Sand and silt are deposited in the middle of the river whereas fine sand and soil are deposited at the fringe of the river banks. Soil/ alluvium varying in thickness from 0.20m to 0.60 m constitute the top horizons in the area suitable for agriculture.

Fine sand: 1/64” (0.04 cm) to 1/32” (0.08 cm)

Medium to coarse sand: 1/16" (0.15 cm)

Gravel: 1/8" to 1/16"

Source: *Mining Plan*

2.3.5 CLIMATE

The district is characterised by moist humid climate. The winter season commences in November and lasts till February. January is the coldest month with mean daily temperature in the range of 5-10oC and mean daily maximum temperature in the range of 20-25^{o}C. Summer season starts from March and lasts up to June. It is followed by the monsoon season and lasts till September. October is transitional period. The district is known as "Cherapunji of Bihar", as it experiences maximum rainfall than any other districts in the state of Bihar.

Source:http://cgwb.gov.in/AQM/NAQUIM_REPORT/Bihar/Kishanganj%20Final%20Bihar.pdf

2.4 GEOLOGICAL RESERVE

The geological reserves have been each stretches & for individual blocks. Geological reserves have been completed through cross sectional area method. The area of each section line is multiplied by strike influence to get the volume. Specific Gravity is taken Dahuk River 2.55 (g/cm^3), Gauriya River 2.57 (g/cm^3), Mahananda River 2.54 (g/cm^3), Mechi River 2.52 (g/cm^3) & Kankai River 2.56 (g/cm^3)

Proved Mineral Reserves (111): All quantities of sand occurring up to depth of 1m from surface has been considered as proved reserves.

Table-2.3:- Proved Mineral Reserves

Dahuk River Sitaljhari Sand Ghat

Classification	Code	Quantity of Sand
A) Mineral Reserves		Cum
1) Proved Mineral Reserve	111	100000
Total		100000

Geological Reserve = 100000 cum. or 255000 tonnes.

Dahuk River Sundarbari Sand Ghat

Classification	Code	Quantity of Sand
A) Mineral Reserves		Cum
1) Proved Mineral Reserve	111	100000
Total		100000

Geological Reserve = 100000 cum. or 255000 tonnes.

Dahuk River Belwa Kashipur Sand Ghat

Classification	Code	Quantity of Sand
A) Mineral Reserves		Cum
1) Proved Mineral Reserve	111	100000
Total		100000

Geological Reserve = 100000 cum. or 255000 tonnes.

Gauriya River Teragachh Sand Ghat

Classification	Code	Quantity of Sand
A) Mineral Reserves		Cum
1) Proved Mineral Reserve	111	10000
Total		10000

Geological Reserve = 10000 cum. or 25700 tonnes.

Mahananda River Purandarpur Sand Ghat

Classification	Code	Quantity of Sand
A) Mineral Reserves		Cum
1) Proved Mineral Reserve	111	280000
Total		280000

Geological Reserve = 280000 cum. or 711200 tonnes.

Mechi River Gambhirgadh Sand Ghat

Classification	Code	Quantity of Sand
A) Mineral Reserves		Cum
1) Proved Mineral Reserve	111	220000
Total		220000

Geological Reserve = 220000 cum. or 554400 tonnes.

Kankai River Palsa Sand Ghat

Classification	Code	Quantity of Sand
A) Mineral Reserves		Cum
1) Proved Mineral Reserve	111	100000
Total		100000

Geological Reserve = 100000 cum. or 256000 tonnes.

Total Geological Reserve of Dahuk River Sitaljhari, Sundarbari, Belwa Kashipur Sand Ghat, Gauriya River Teragachh Sand Ghat, Mahananda River Purandarpur Sand Ghat, Mechi River Gambhirgadh Sand Ghat & Kankai River Palsa Sand Ghat = 910000 cum or 2312300 tonnes.

Source: Mining Plan

2.4.1 Mineable Reserves:

Mineable reserves have been computed up to 1 m depth from surface. The volume multiplied by Specific Gravity is taken Dahuk River 2.55 (g/cm^3), Gauriya River 2.57 (g/cm^3), Mahananda River 2.54 (g/cm^3), Mechi River 2.52 (g/cm^3) & Kankai River 2.56 (g/cm^3) to get the tonnage.

Table-2.4:- Summary of minable reserves of Kishanganj - 05 Sand Ghat

Dahuk River Sitaljhari Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
57-56	585	151	1	88335	225255
Total				88335	225255

Dahuk River Sundarbari Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
50-49	576	154	1	88704	226195
Total				88704	226195

Dahuk River Belwa Kashipur Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
49-48	837	101	1	84537	215570
Total				84537	215570

Gauriya River Teragachh Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
62-61	93	77	1	7161	18404
Total				7161	18404

Mahananda River Purandarpur Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
72-71	891	281	1	250371	635942
Total				250371	635942

Mechi River Gambhirgadh Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
58-57	978	207	1	202446	510164
Total				202446	510164

Kankai River Palsa Sand Ghat

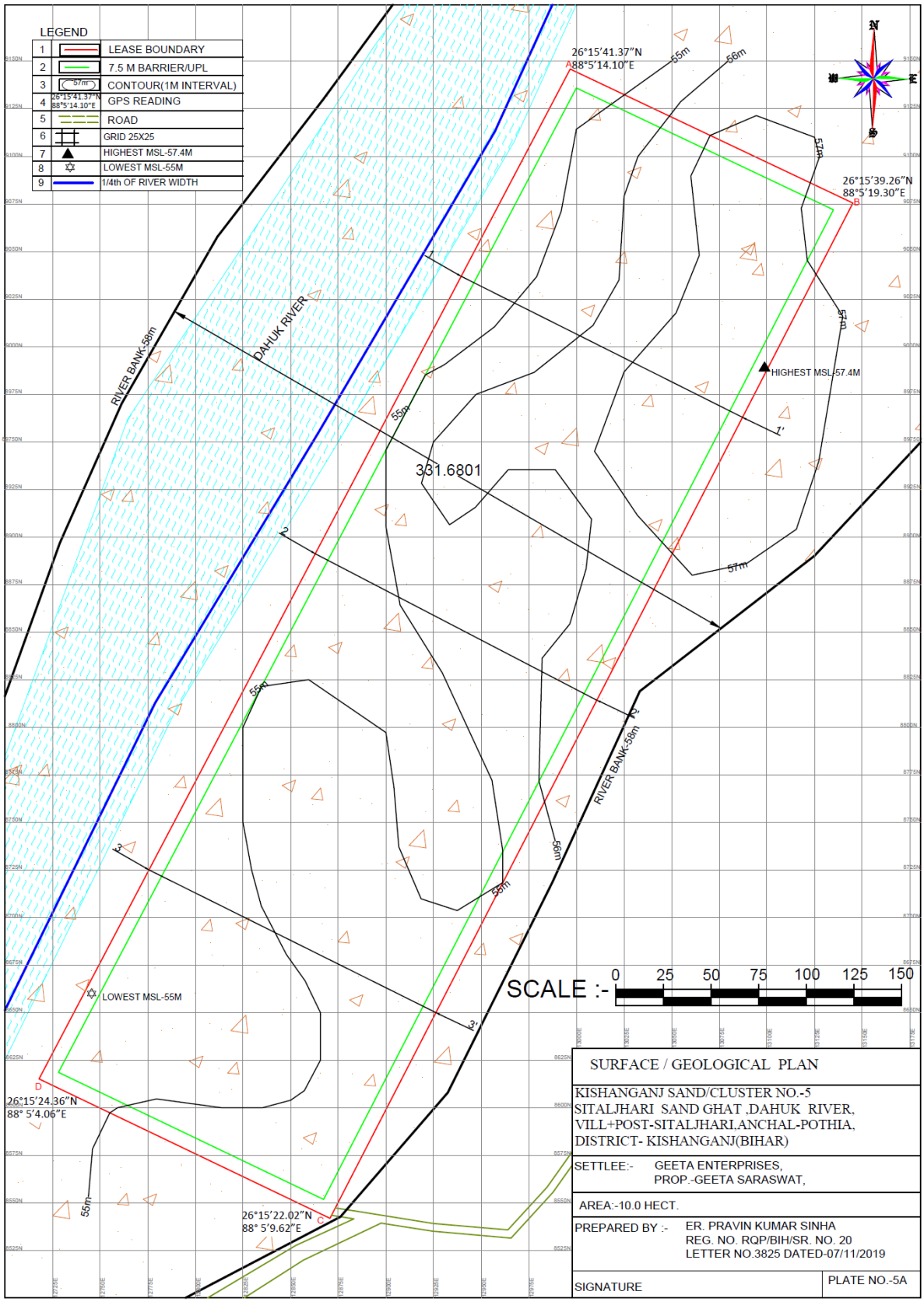
Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
71-70	653	137	1	89461	229020
Total				89461	229020

Total Mineable Reserve of Dahuk River Sitaljhari, Sundarbari, Belwa Kashipur Sand Ghat, Gauriya River Teragachh Sand Ghat, Mahananda River Purandarpur Sand Ghat, Mechi River Gambhirgadh Sand Ghat & Kankai River Palsa Sand Ghat = 811015 cum or 2060550 tonnes.

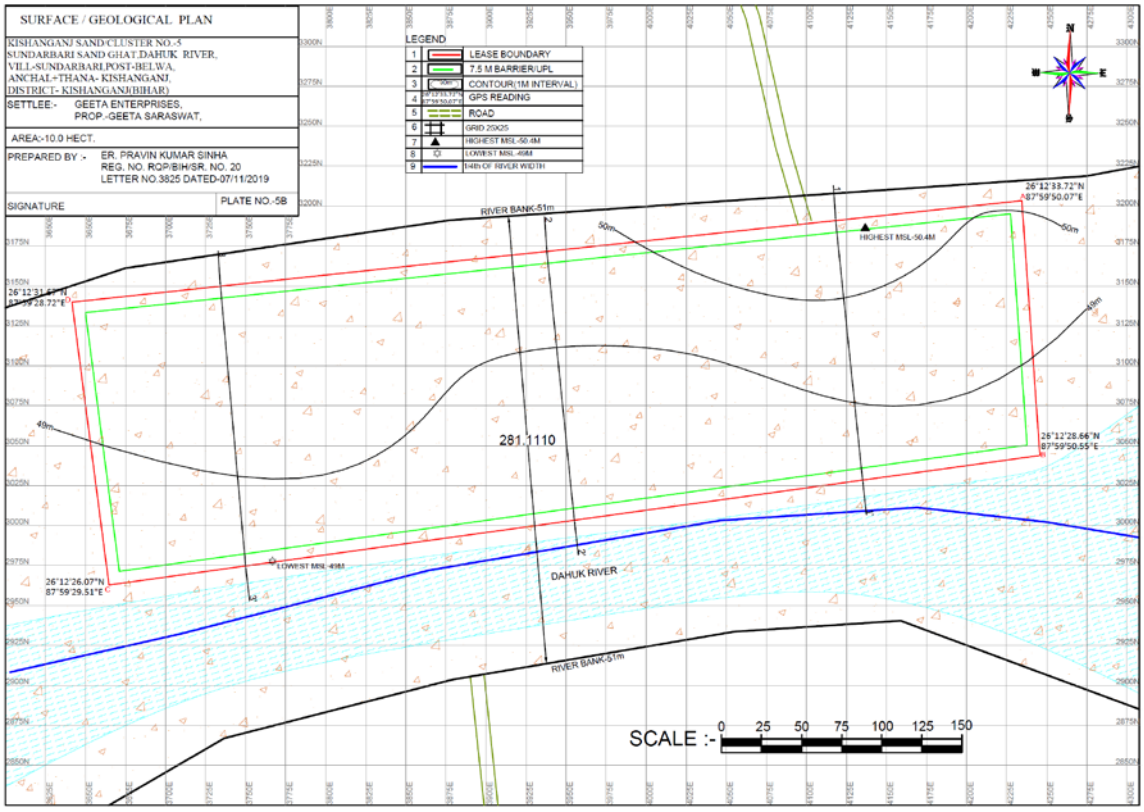
Table-2.5:- Classification Mineral Reserves

Sand Ghat	Area (Hect)	Geological Reserves (m3)	Mineable Reserves (m3)	Annual Permitted Reserve As per LoI (m3)
Kishanganj Unit 05	91.0	910000	811015	546000

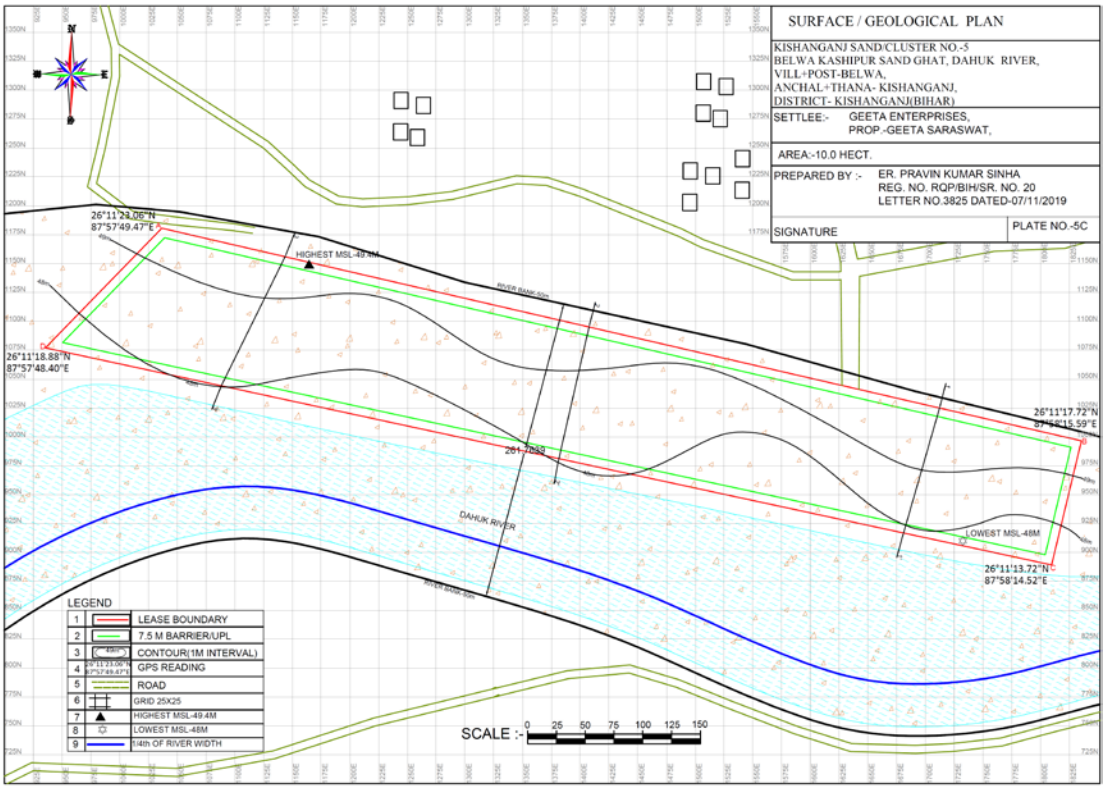
The annual extractable RBM comes to 546000 cum or 1387380 tonnes. It will be replenished after rainy season every year.



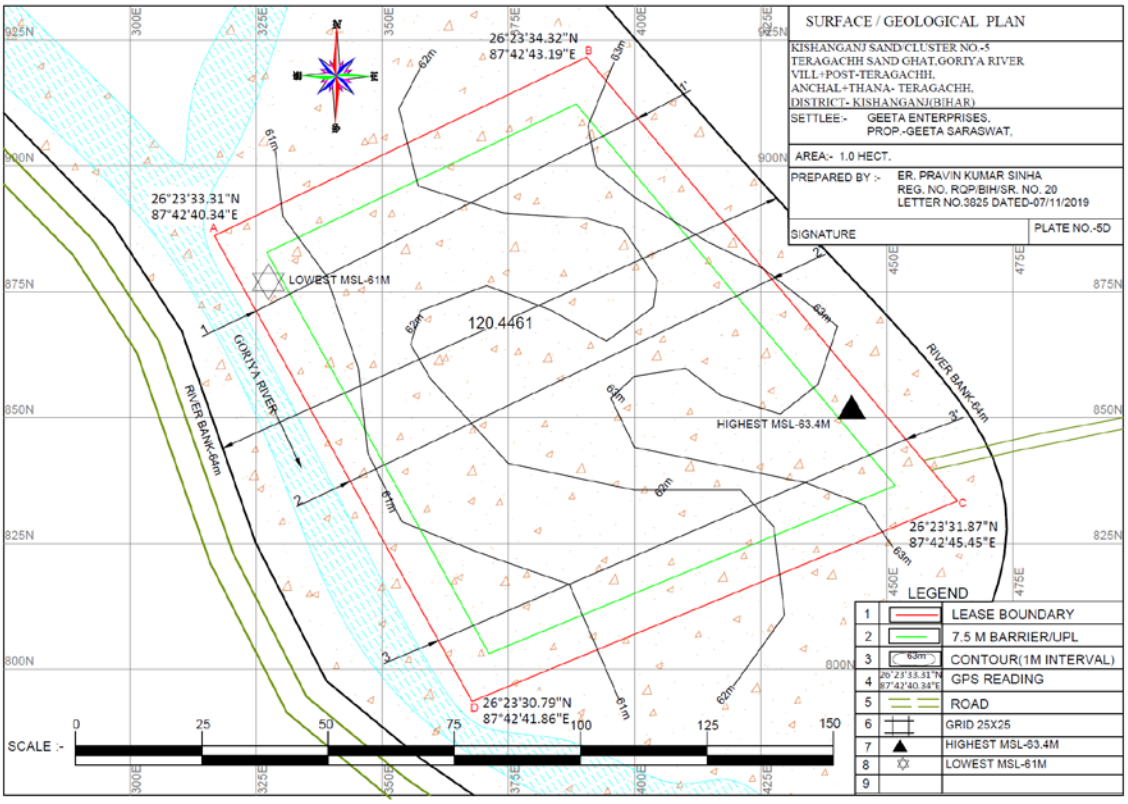
Sitaljhari Sand Ghat



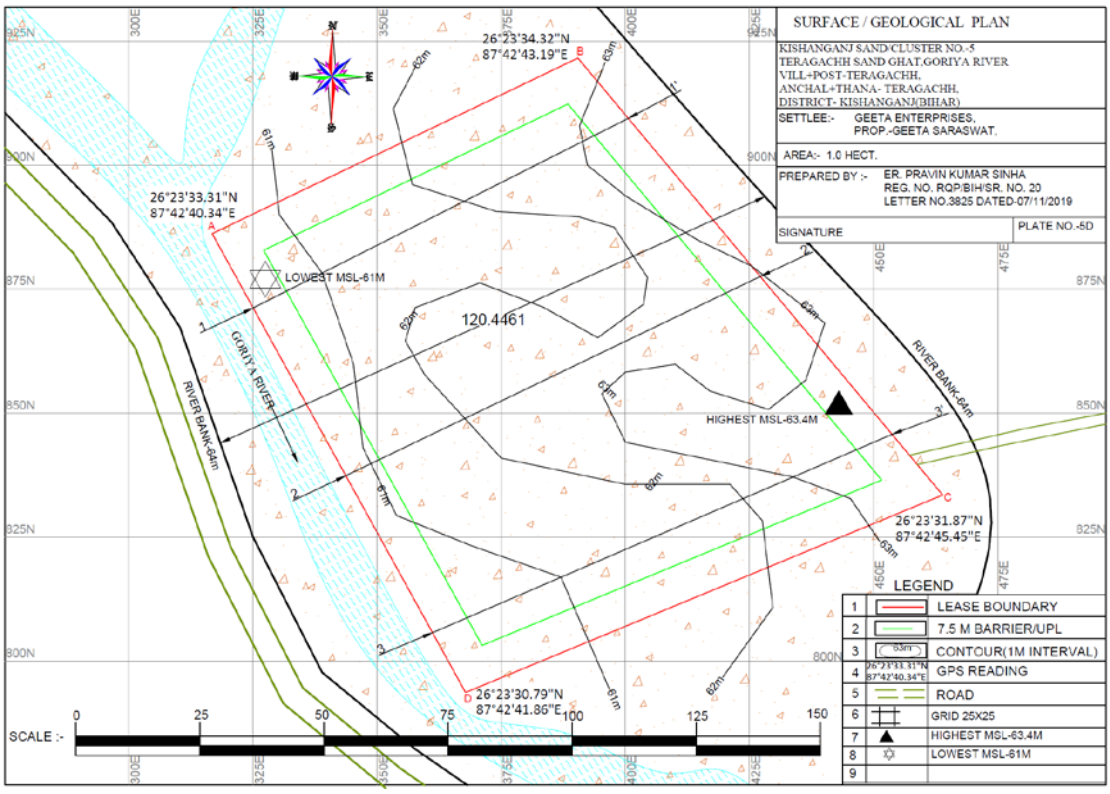
Sundarbari Sand Ghat



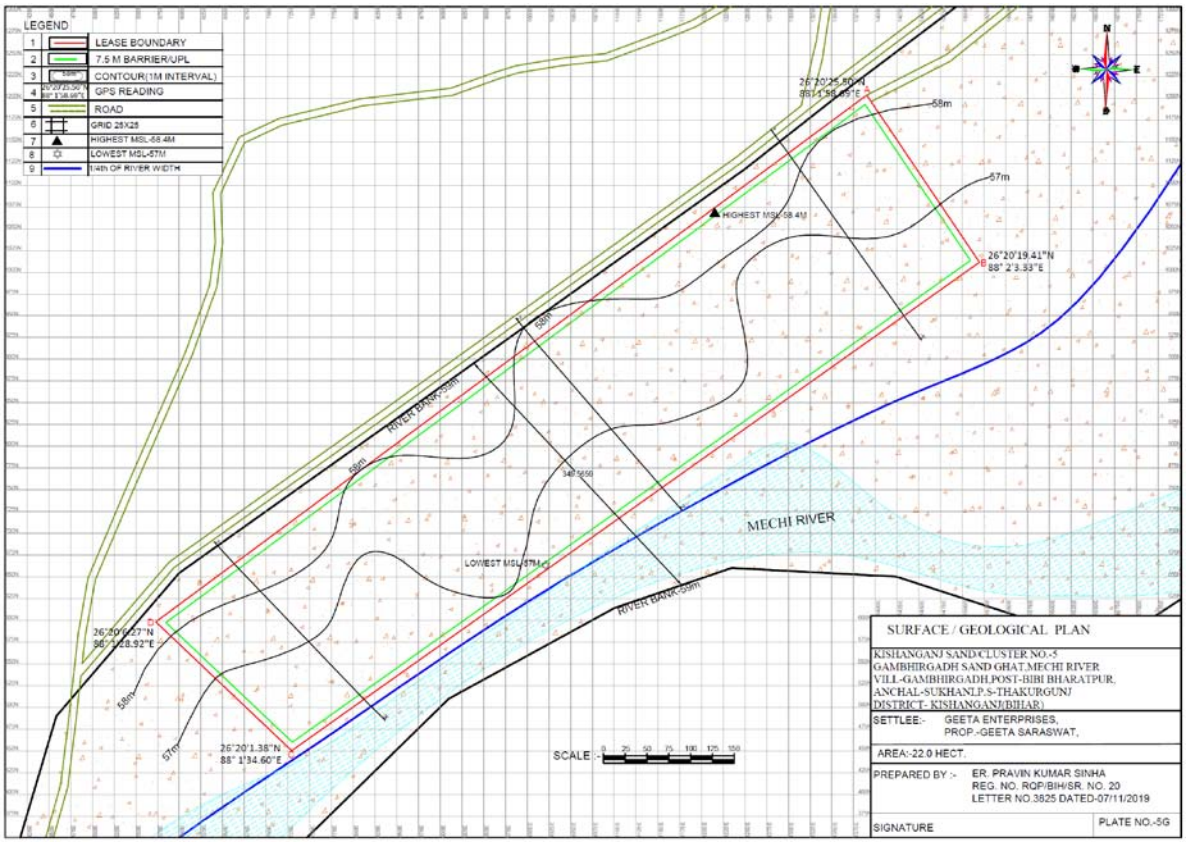
Belwa Kashipur Sand Ghat



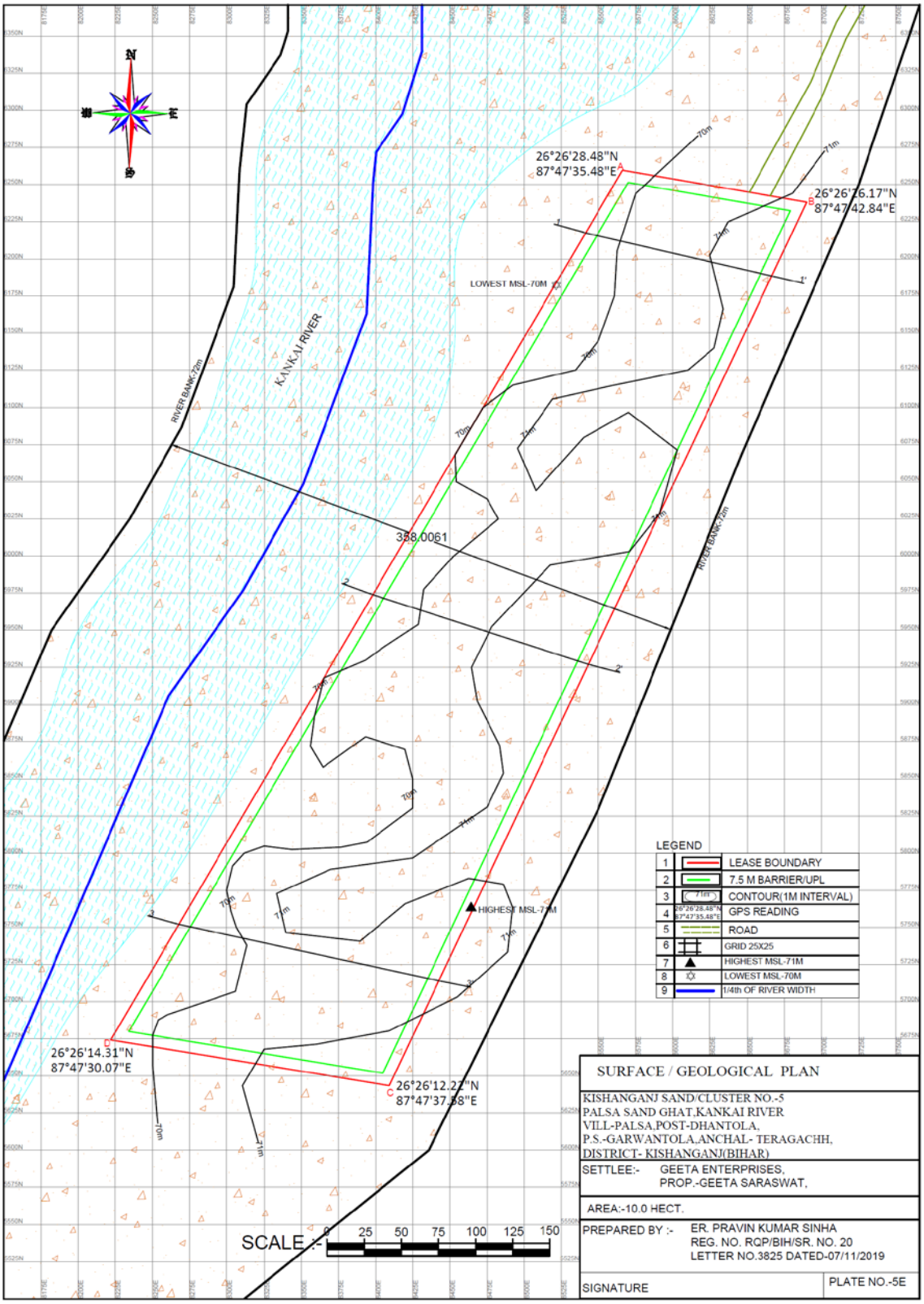
Teragachh Sand Ghat



Purandarpur Sand Ghat



Gambhirgadh Sand Ghat



Palsa Sand Ghat

Figure 2.3:- Surface cum Geological Section of Kishanganj Unit 05

2.4.2 Type of Mining

- Mining will be done as per the guidelines of Bihar Mineral (Concession Prevention of illegal

  Mining Transportation & Storage) Rules, 2019.
- This is an open-cast mining project. The operation will be semi-mechanized/OTFM with use of excavators/JCBs truck /tractors combination or Manually etc. The sand will be collected in its existing form.
- Sand Mining will be carried out only upto a depth of 1 m bgl or above ground water level (whichever is less), for river bed block.
- No drilling /blasting are required as the material is loose in nature.
- Proper benching of 1.5 m height and 6m width will be maintained for mining blocks as per guideline M.M.R-2019, under rule 115(1).
- Mining will be done only during the day time and completely stopped during the monsoon season.

2.4.3 Year Wise Production Schedule:

The bench wise annual exploitation of sand from Kishanganj Unit- 05 Sand Ghat are given below :-

Table 2.6: Year wise Production Details

YEAR	ROM sand (cum)
1st Year	546000
2nd Year	546000
3rd Year	546000
4th Year	546000
5th Year	546000

The annual extractable RBM comes to **546000 cum or 1387380 Tonnes**. It will be replenished after rainy season every year.

Source: Mining Plan

2.5 Conceptual Mining Plan

Mine Applied Area will be worked for Kishanganj Unit- 05 Sand Ghat. However, as the digging depth will be restricted to 2.0 m only. This will be further replenished during rainy season. Sand Ghat will be worked systematically as the width is limited while length is much more. As the lease period is only 5 (Five) years, some of the area will be left un-worked at the end of lease period.

(i) Final Slope Angle to Be Adopted: Height of the bench is limited to 1.0 m while width of individual bench shall be kept 6.0 m. River bank side will be protected by working in dry part of the river and by leaving safety distance of the width of the river of 5 meter. Bank side natural slope will not be disturbed. This will prevent collapse of bank and erosion. However, the height of the bank with respect to river bed is varying from 3-4 meters.

(ii) During plan period workings will be carried out in the Balu ghat at a time of the Applied Area simultaneously. Scattered workings will ensure safety, remove congestion of vehicles and will have better control and management.

(iii)Ultimate Capacity of Dumps: There will be no OB removal / during the plan period. Therefore no proposal has been envisaged for its separate dumping. No outside material will be filled up in the extracted zone..

2.6 Anticipated life of mine

There is as such no specific life of the mine as the area under reference is inactive part of river bed of the river and its pale channels and whatever quantity of minor minerals are extracted from the Applied Area during five year; almost equal to extracted quantity of the same are replenished every year and the river bed area will be leveled & restored back.. However, as lease has been granted for 5 years, mining will be done for the allotted time.

2.6.1 Waste –disposal arrangement

No waste as such will be generated at the site as all materials are saleable. If, at all silt clay will be generated along with the minerals will be used to dispose off in the low lying areas as spread, where plantation will be done after spreading top soil on it.

2.7 GENERAL FEATURES

2.7.1 Land-use pattern

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

2.7.2 Surface drainage pattern

The mine site lie on the dry bed of Dahuk, Gauriya, Mahananda, Mechi & Kankai so there will be no impact on surface water.

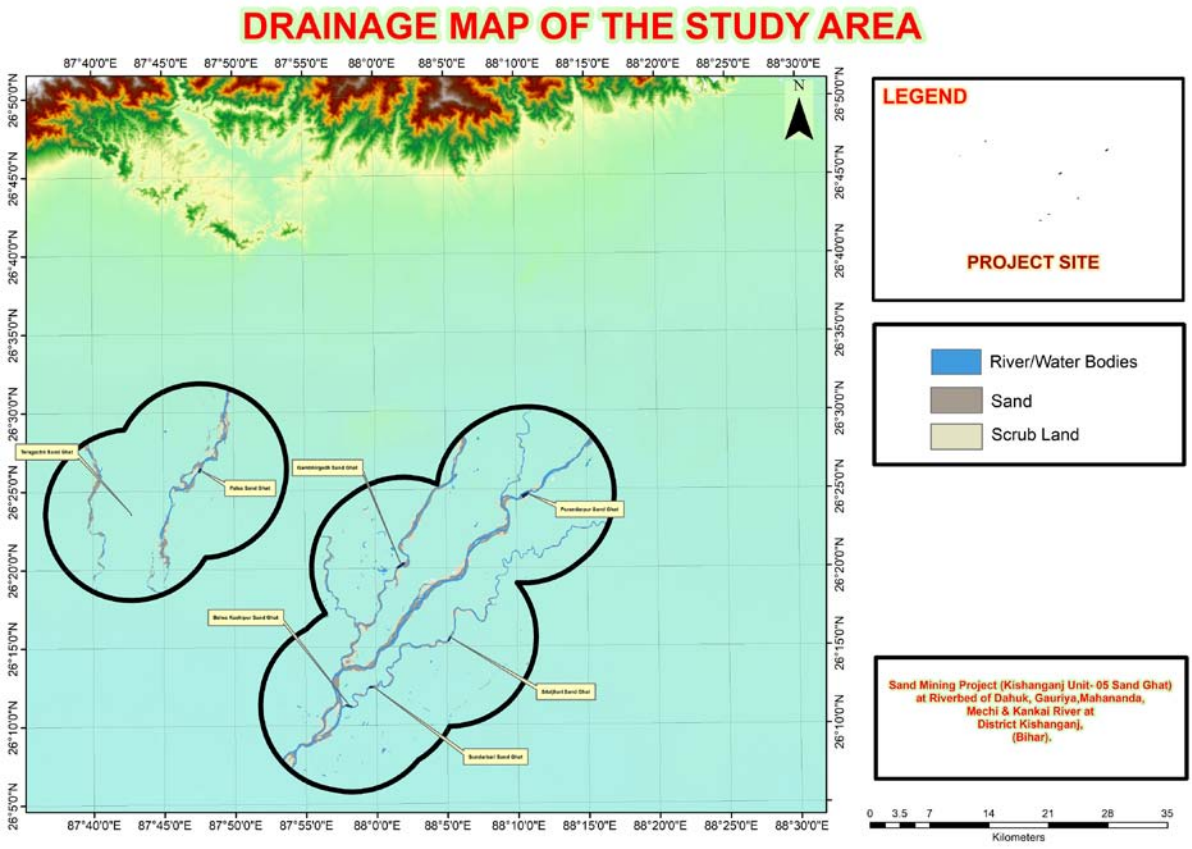


Fig-2.4, Drainage Map

2.7.3 Man power requirement

The manpower requirement for the proposed project will be around 94 who will be utilized for excavation & loading of minerals into trucks or tractor-trolleys. Break-up of Man-power requirement is given in below **Table 2.7.**

Table 2.7 Manpower Requirement

S. No.	Category	Numbers
1.	Administration	1
2.	Supervisor	7
3.	Skilled	16
4.	Un-skilled	70
TOTAL		**94**

2.7.4 Water supply

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

TABLE 2.8 - Water requirement

Activity	Calculation	Round off Figure in KLD
Drinking	@ 10 lpcd per labor 10*94/1000= 0.94 KLD	0.94
Dust Suppression	**Total approach road to be water sprinkled** = (Sitaljhari Sand Ghat = 535m + Sundarbari Sand Ghat = 815m + Belwa Kashipur Sand Ghat = 100m + Teragachh Sand Ghat = 850m + Purandarpur Sand Ghat = 1410m + Gambhirgadh Sand Ghat = 1860m + Palsa Sand Ghat = 1360m) Total 6930m for Kishanganj Unit- 05 6930m*6m*0.5 *2 times 41580/1000= 41.58 KLD	41.58
Plantation	910 plant (during plan period) @ 5 L/per plant= 910*5lts= 4550/1000= 4.55 KLD	4.55
Total		**47.07 or 47.0 KLD**

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

2.7.5 Site services

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

- A temporary rest shelter will be provided for the workers near to the site for rest.
- Provisions will also be made for following in the rest shelter:

❖ First aid box will be made available at the site. In emergency worker.

❖ Sanitation facility i.e. septic tank or community toilet facility will be provided for the workers.

❖ Mask and gloves distribution to the workers.

2.7.6 Extent of mechanization

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

2.7.7 Statutory requirements

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

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

- Bihar Minor Mineral Concession Rule, 2014 amended till date.
- The Mines Act, 1952.
- The Mines and Mineral (Development and Regulation) Act, 1957.
- Mines Rules, 1955.
- Mineral Concession Rules, 1960.
- Mineral Conservation and Development Rules, 1988.
- The Water (Prevention and Control of Pollution) Act, 1974.
- The Air (Prevention and Control of Pollution) Act, 1981.
- The Environment (Protection) Act, 1986.
- The Forest (Conservation) Act, 1980.
- The Wildlife (Protection) Act, 1972.

****

3.0 General

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

3.0.1 Study area & study period

The proposed project as a center, a radial distance of 10 km is considered as study area for baseline data collection and environmental monitoring. The baseline environment quality was carried out over a radial distance of 10 km around the mining lease area during the months of March 2023 to May 2023.

3.0.2 Methodology

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

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

- ✓ Soil sample were collected from various location in the study area to analyze physical and chemical characteristics for assessment of impact on soil.
- ✓ Surface and Ground water samples were also collected from the various locations in the study area for analysing the existing water quality in the study area.
- ✓ Noise measurement has been done in core zone as well as buffer zone to analyze the existing situation in the study area.
- ✓ Literature review that includes identification of relevant data and articles from various publications, various government agencies and other sources for socio-economy, demography has been done with primary data collection in 10 km of the study area.
- ✓ Existing pollution load has been also identified in the buffer zone due to similar activities.
- ✓ Accordingly, field studies were carried out during the study period (March to May 2023) to establish the existing baseline conditions.

3.1 Land Environment of the Study area

Land use

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

Land cover

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

To assess the land use pattern surrounding the 10 km radius of the site, a detailed study was carried out. The land use pattern study reveals that the 10 km environs is predominantly agricultural land. The land use details are given in **Table- 3.1** and shown in **Figure-3.1.**

Table 3.1: Land Use Cover of the Project Study Area

Landuse Type	Area (Ha)
Scrub Land	2795.99
Forest	3360.07
River/Water Bodies	4714.14
Settlement	23400.48
Vegetation	146.46
Sand	3611.35
Agriculture	123779.56
AREA	**161808.05**

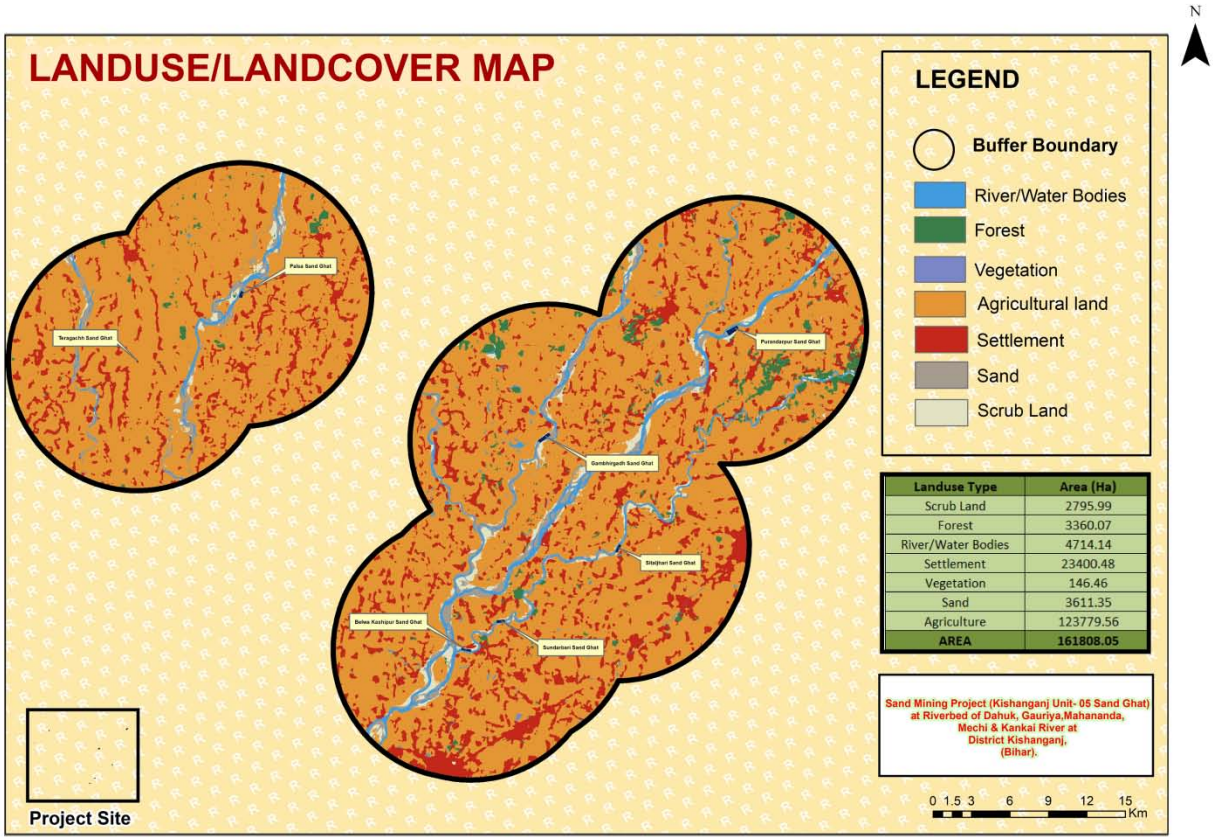


FIGURE 3.1: LAND USE COVER OF THE PROJECT STUDY AREA

3.2 Water Environment

Water quality assessment is one of the essential components of EIA study. Such assessment helps in evaluating the existing health of water body and suggesting appropriate mitigation measures to minimize the potential impact from development projects. Water quality of

ground water has been studied in order to assess proposed water-uses in construction, drinking, cooling and horticulture purpose.

The water quality at the site and other locations within the 10 km impact zone was monitored during March 2023 to May 2023. The water sampling locations marked within the study are presented in **Table 3.2** and **Figure 3.2** and the result of the monitoring and analysis are presented in the **Table 3.3** showing Water Quality Monitoring Locations marked within the Study Area.

Table 3.2: WaterSampling Locations

Water (Ground) Monitoring Locations		
GW1	Village Palsa (from Palsa Sand Ghat)	654 meter, West
GW2	Village Khanij Khaniabad from (Teragachh Sand Ghat)	182 meter, SW
GW3	Village Baraghara From (Purandarpur Sand Ghat)	500 meter, East
GW4	Village Gharigora) From (Gambhirgadh Sand Ghat)	373 meter, SE
GW5	Village Sitajlhari From (Sitajlhari Sand Ghat)	1.1 Km, SE
GW6	Village Udra) From (Sundarbari Sand Ghat)	500 meter, SE
GW7	Village Belwa Kashipur) From (Belwa Kashipur Sand Ghat)	342 meter, SE

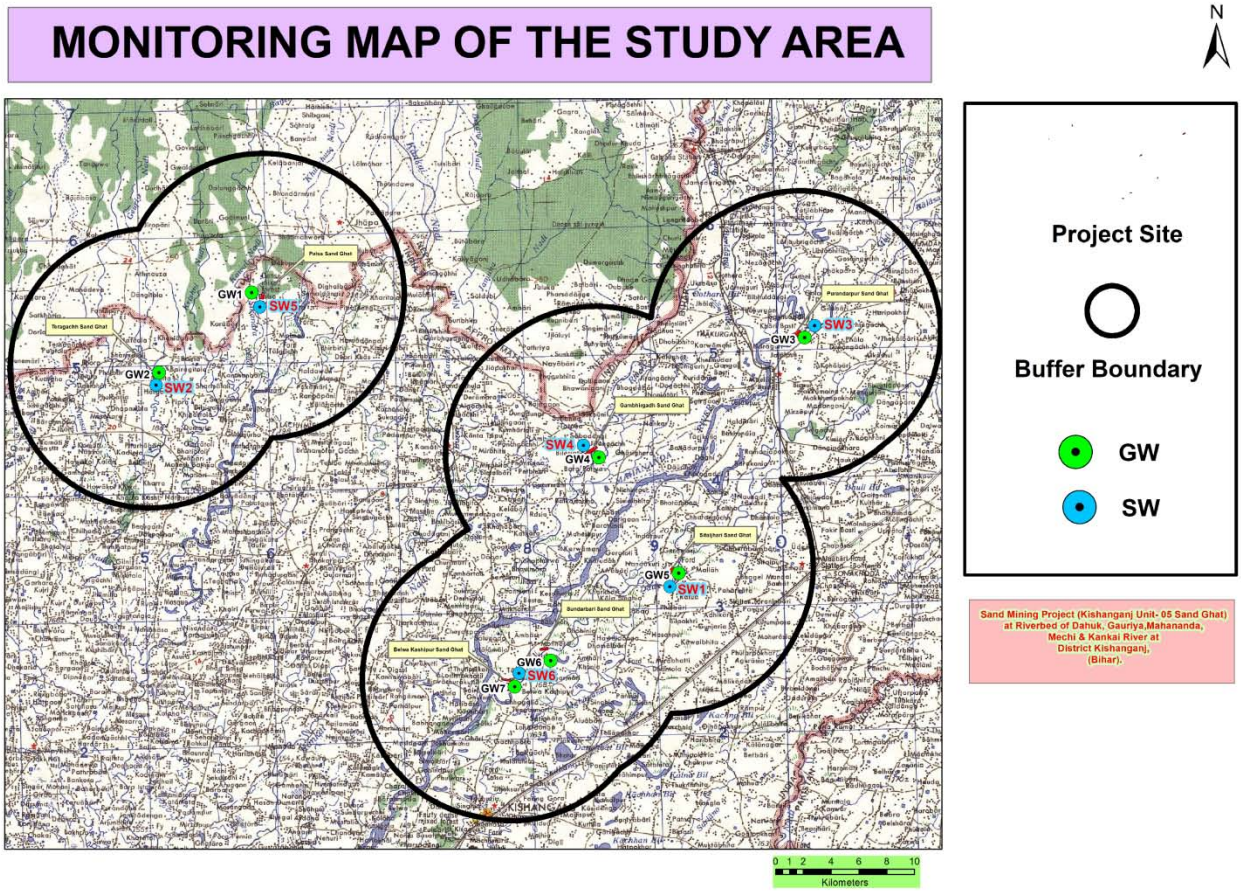


Figure 3.2 Water Sampling Location Map

Table 3.3 Ground Water Quality Monitoring Result

S. No.	Parameter	Unit	Limit (as per IS:10500)		GW1	GW2	GW3	GW4	GW5	GW6	GW7
			Accept	Permissible							
1	Colour	Hz	5	25	<2	<2	<2	<2	<2	<2	<2
2	Odour	-	Un	-	Un	Un	Un	Un	Un	Un	Un
3	Taste	-	Agreeable	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	5	10	<1	<1	<1	<1	<1	<1	<1
5	pH	-	6.5-8.5	No Relaxation	7.09	6.98	6.94	7.24	6.93	7.22	7.27
6	Total Hardness (as CaCO3)	mg/l	300	600	195	175	200	227	210	203	199
7	Iron (as Fe)	mg/l	0.3	1.0	0.02	0.01	0.02	0.02	0.03	0.04	0.03
8	Chlorides (as Cl)	mg/l	250	1000	28	26	23	24	31	33	29
9	Fluoride (as F)	mg/l	1	1.5	0.2	0.2	0.3	0.2	0.3	0.2	0.2

10	TDS	mg/l	500	2000	398	382	352	325	364	355	351
11	Calcium(as Ca2+)	mg/l	75	200	43	40.1	38.5	35.0	43.0	41.0	38.0
12	Magnesium (as Mg2+)	mg/l	30	100	22.0	21.0	20.0	24.0	20.0	21.0	23.0
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
14	Manganese(as Mn)	mg/l	0.1	0.3	0.02	0.02	0.01	0.01	0.01	0.01	0.01
15	Sulphate (as SO4)	mg/l	200	400	12	13	11	11	10	12.0	10.0
16	Nitrate(as NO3)	mg/l	45	No Relaxation	1.1	1.3	1.1	1.2	1.3	1.3	1.2
17	Phenolic Compounds (as C6H5OH)	mg/l	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
23	Lead (as Pb)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Zinc (as Zn)	mg/l	5	15	0.03	0.02	0.02	0.03	0.04	0.02	0.03
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Chromium (as Cr6+)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
27	Mineral oil	mg/l	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
28	Alkalinity as CaCO3	mg/l	200	600	150	147	135	129	132	138	141
29	Aluminium (as Al)	mg/l	0.03	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
30	Boron (as B)	mg/l	1	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Microbiological Parameter										
31	Total Coliform	MPN /100 ml	10 , Max	-	<2	<2	<2	<2	<2	<2	<2

32	*E. coli*	E.coli /100 ml	Absent	-	Absent	Absent	Absent	Absent	Absent	Absent	Absent

Observation:

Analysis of results of ground water reveals the following: -

- pH varies from **6.93 to 7.27**.
- Total hardness varies from **175 mg/l to 227 mg/l** .
- Total dissolved solids vary from **325 mg/l to 395 mg/l**.

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

3.2 (b) SURFACE WATER

Three surface water samples were collected from the study area. The location of surface water samples is given in Table 3.3 (iii). The physio-chemical analysis of the these samples are given in the Table 3.3 (iv)

Table 3.4: Surface water sampling locations

Surface Water Monitoring Locations		
SW1	Project Site (River Dahuk)	-
SW 2	Project Site (River Gauriya)	-
SW 3	Project Site (Mahananda River)	-
SW 4	Project Site (Mechi River)	-
SW 5	Project Site (Kankai River)	

Table 3.5: Physio-chemical properties of surface water

S.No.	Parameter	Unit	S.W. 1	S.W. 2	S.W. 3	S.W. 4	S.W. 5
1	pH	-	7.24	8.15	7.78	8.35	8.18
2	Dissolved Oxygen	mg/l	5.5	6.3	7.0	6.9	6.1
3	BOD (3 Days at 27 °C)	mg/l	5	3	3	4	5
4	Free Ammonia (as N)	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1
5	Sodium Adsorption Ratio	-	0.21	0.30	0.42	0.41	0.31
6	Boron	mg/l	0.26	0.15	0.27	0.28	0.29

7	Conductivity	µs/cm	450	420	492	437	455
8	Turbidity	NTU	3	2	2	2.5	2
9	magnesium hardness (as CaCO3)	mg/l	90	92	100	95	92
10	Total Alkalinity (as CaCO3)	mg/l	146	159	165	169	166
11	Chloride (as Cl)	mg/l	27	30	31	29	30
12	sulphate (as SO4)	mg/l	11	13	11.5	12	11
13	Nitrate (as NO3)	mg/l	2.8	3.0	3.0	3.2	3.1
14	Fluoride (as F)	mg/l	0.21	0.31	0.35	0.23	0.32
15	Sodium (as Na)	mg/l	12	13.5	14	14	12.5
16	Potassium (as K)	mg/l	3.0	3.1	4.1	4.2	3.5
17	TKN (as N)	mg/l	2.8	2.5	3.2	2.4	2.7
18	Total Phosphorous (as P)	mg/l	0.12	0.11	0.11	0.12	0.12
19	COD	mg/l	18	15	11	13	14
20	Phenolic compounds (as C6H5OH)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
21	Iron (as Fe)	mg/l	0.34	0.28	0.30	0.29	0.28
22	Zinc (as Zn)	mg/l	0.08	0.05	0.05	0.08	0.05
23	Mercury (as Hg)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
24	Total Dissolved Solids (TDS)	mg/l	330	305	325	318	310
Microbiological Parameters							
1	Total Coliform	MPN /100ml	1800	1900	1980	1820	1950
2	Faecal Coliform	MPN /100ml	920	940	880	870	920

3.2.1 Sampling frequency

Parameters for analysis of water quality were selected based on the utility of the particular source of water as per CPCB guidance. Surface water quality was monitored for parameters as per Methods of Monitoring & Analysis published by CPCB and it was rated according to the CPCB Water Quality Criteria against A, B, C, D & E class of water. Water samples were collected as Grab water sample from sampling location for complete physico-chemical and bacteriological tests respectively. The samples were analyzed as per standard procedure / method given in IS: 10500.

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

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

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

3.2.2 Result & Conclusion:

Surface water Observation:

- The analysis results indicate that the pH ranges between **7.24 to 8.35.**
- Dissolved Oxygen (DO) was observed in the range of **5.5 to 7.0 mg/l** against the

minimum requirement of 4 mg/l.

- BOD values were observed to be in the range of **3.0 to 5.0mg/l.**
- Total Coliform examination of surface water samples revealed the presence of total coliform in range of 1800 MPN/100 ml to 1980 MPN/100 ml .

  Based on the results it is evident that most of the parameters of the samples comply with 'Category 'C' standards of CPCB (Table 3.5) are indicating their suitability for only Drinking water source after conventional treatment and disinfections.

3.3 Air Environment

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

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

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

- Wind speed
- Wind Direction
- Air Temperature

Table-3.7, Summarized project site meteorological data for Pre monsoon Season

Month	Temperature °C			Wind Speed (Km/Hr)	
	Min	Average	Max	Min	Max
MARCH 2023	20	27	37	11.5	19.9
APRIL 2023	24	32	41	12	20.6
MAY 2023	25	31	39	15	24.2

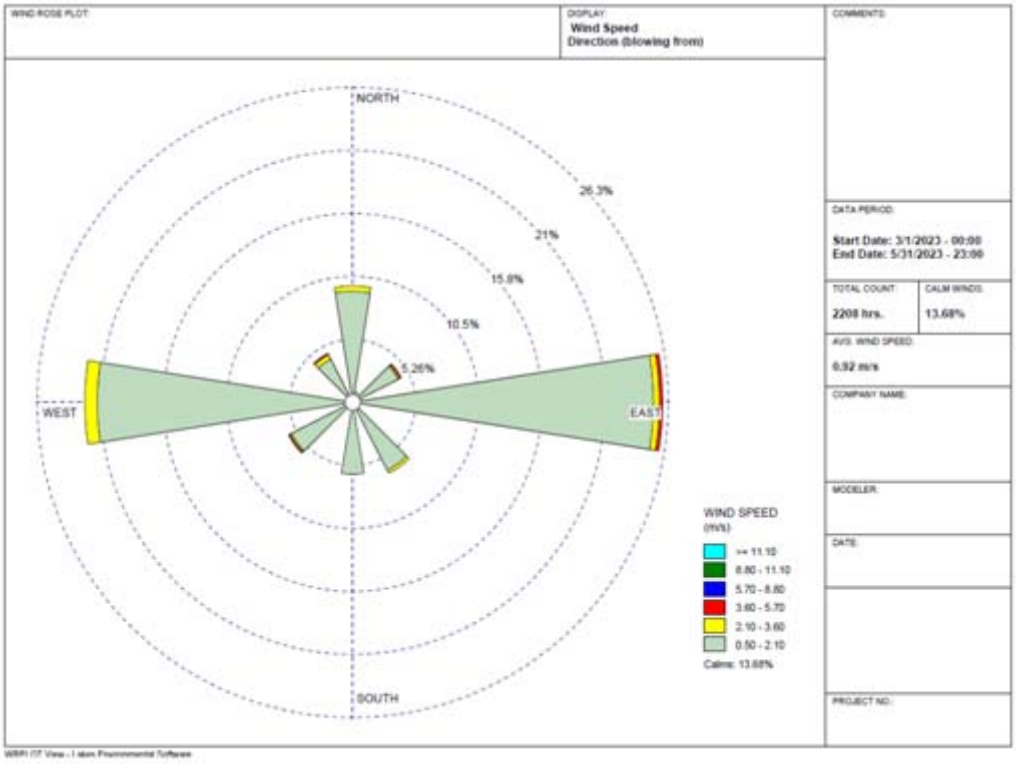


Figure 3.3: Wind Rose Diagram (at site)

3.3.1 Secondary Data Collected from IMD

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

The meteorological data is collected from the IMD- Purnea is about 73 km from project site, which is the nearest operating IMD station to the project site. The data collected from IMD includes wind speed, wind direction, temperature, relative humidity and rainfall for the year 1981-2010. The monthly maximum, minimum and average values are collected for all the parameters except wind speed and direction. The collected data is tabulated in **Table-3.6**

When the data generated at project site is compared with the data recorded at IMD, it is observed that the data generated at the site is broadly in comparison with regional meteorology, except for minor variations as described above.

3.3.2 Comparison of primary and secondary data

The India Meteorological Department (IMD) records the data twice a day viz. 0830 hr and 1730 hr while the site-specific data has been recorded at an hourly interval. On comparison of

site specific data generated for study period vis-à-vis the IMD data, slight variations were observed. The following observations are brought out:

When the data generated at project site is compared with the data recorded at IMD, it is observed that the data generated at the site is broadly in comparison with regional meteorology, except for minor variations as described above such as predominant wind direction is NW at IMD while at project site predominant wind direction is West.

3.3.3 Ambient Air Quality

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

METHOD OF MONITORING

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

Methods adopted for PM2.5, PM10, SO2 and NOX (as NO2)

Parameters	Technique	Technical Protocol	Minimum Detectable Limit
PM2.5	Gravimetric method	US EPA Method	5 (µg/m3)
PM10	Gravimetric method	IS 5182 (Part-XXIII)	5 (µg/m3)
Sulphur Dioxide	West and Gaeke	IS-5182 (Part-II)	3 (µg/m3)
Nitrogen Oxide	Jacob & Hochheiser	IS-5182 (Part-VI)	7 (µg/m3)

i. Particulate Matter (PM):-

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

ii. Equipment calibration:

For accurate testing of emission sources, the components of the sampling train is calibrated by outsource and supplier (Master Calibrator) standards and solutions are used, calibrated under certified reference material.

3.3.4 Selection criteria for monitoring location

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

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

Ambient Air Quality Monitoring (AAQM) stations were set up at **15 locations** with due consideration to the above mentioned points. AAQM locations were selected in downwind, upwind as well as crosswind direction of the proposed mining lease area covering core and buffer zones. The details of the monitoring stations are given in **Figure 3.4** and shown in **Table-3.7**

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

The baseline values of the air pollutants of concern are presented in Tables below statistical parameters like minimum, maximum, average and 98^{th} percentiles have been computed from the observed field data for all sampling stations and are given **Table-3.8, Table-3.9, Table-3.10& Table 3.11.** These are compared with the standards prescribed by Central PollutionControl Board (CPCB) for industrial, residential and rural zone.

Table 3.8: Ambient Air Quality Monitoring Stations

SITE	Location	Distance (Km) and Direction
AAQ1	Near Project Site Village Kantu Bhast (from Palsa Sand Ghat)	500 Meters, East
AAQ2	Near Project Site Village Khanij Khaniabad from (Teragachh Sand Ghat)	182 Meters, SW
AAQ3	Village Palsa (from Palsa Sand Ghat)	654 Meters, West
AAQ4	Phatbari From (Teragachh Sand Ghat)	2.50 Km, West

AAQ5	Kanchanbari (from Palsa Sand Ghat)	8.00 Km,SE
AAQ6	Dhapartola From (Teragachh Sand Ghat)	2.39 Km,SW
AAQ7	Near Project Site Village Barahghara From (Purandarpur Sand Ghat)	500 Meters, East
AAQ8	Near Project Site Village Gharigora From (Gambhirgadh Sand Ghat)	373 Meters, SE
AAQ9	Near Project Site Village Sitajlhari From (Sitajlhari Sand Ghat)	500 Meters, East
AAQ10	Near Project Site Village Udra From (Sundarbari Sand Ghat)	500 Meters, SW
AAQ11	Near Project Site Village Belwa Kashipur From (Belwa Kashipur Sand Ghat)	342 Meters, SE
AAQ12	Guthni From (Purandarpur Sand Ghat)	4.01 Km, NW
AAQ13	Indarpuri From (Sitajlhari Sand Ghat)	3.5 Km, NW
AAQ14	Bilayatibari From (Gambhirgadh Sand Ghat)	2.26 Km, West
AAQ15	Hatamala From (Sundarbari Sand Ghat)	1.99 Km, West

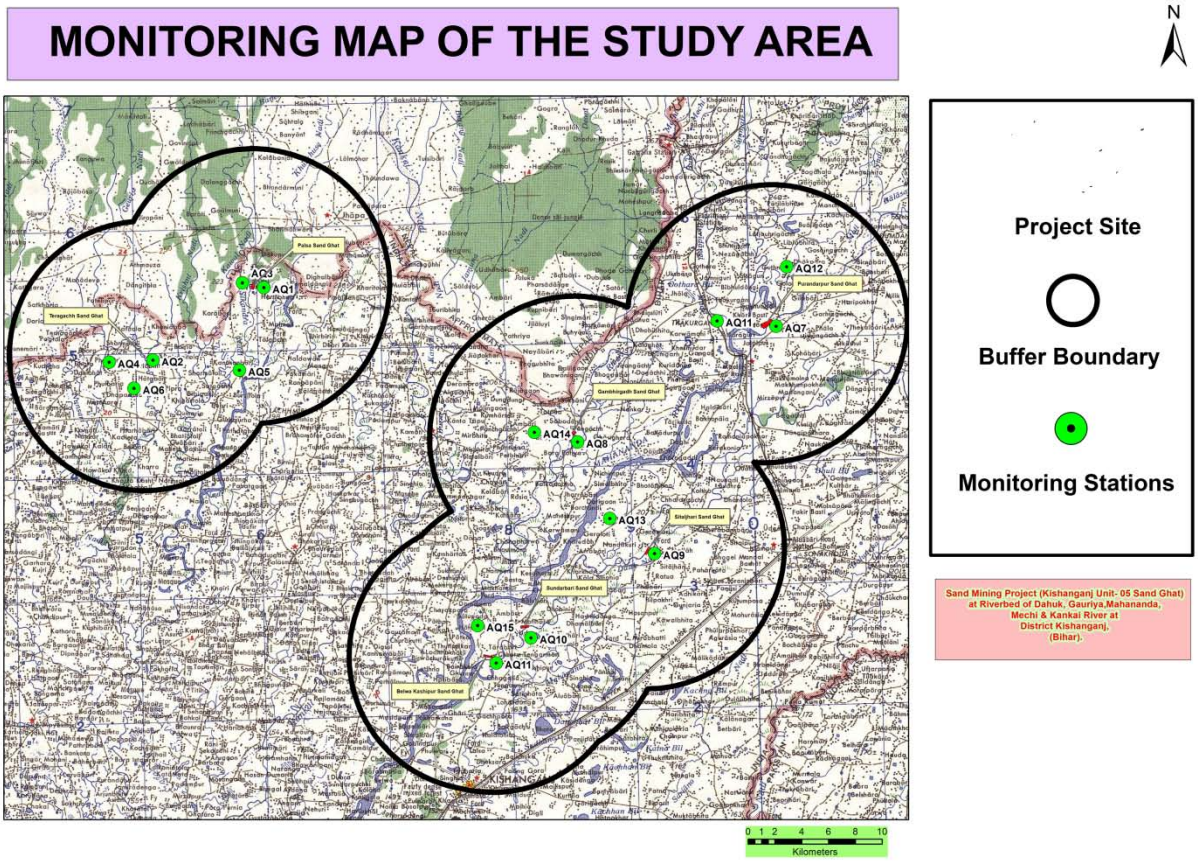


Figure 3.4 Ambient Air Quality Monitoring Stations

Table-3.9: Ambient Air Quality in the Study Area PM2.5

Location Code	PM2.5 (µg/m^3)				
	Location	Min	Max	Average	98th Percentile
AAQ1	Near Project Site Village Kantu Bhast (from Palsa Sand Ghat)	40.84	45.73	43.59	45.73
AAQ2	Near Project Site Village Khanij Khaniabad from (Teragachh Sand Ghat)	34.8	46.85	43.25	46.57
AAQ3	Village Palsa (from Palsa Sand Ghat)	31.72	44.91	40.89	44.91
AAQ4	Phatbari From (Teragachh Sand Ghat)	36.78	46.91	43.95	46.91
AAQ5	Kanchanbari (from Palsa Sand Ghat)	35.98	45.48	42.04	45.48
AAQ6	Dhapartola From (Teragachh Sand Ghat)	34.73	46.35	42.7	46.24
AAQ7	Near Project Site Village Barahghara From (Purandarpur Sand Ghat)	35.58	44.84	42.14	44.82
AAQ8	Near Project Site Village Gharigora From (Gambhirgadh Sand Ghat)	32.63	44.88	40.74	44.4
AAQ9	Near Project Site Village Sitajlhari From (Sitajlhari Sand Ghat)	33.63	47.18	41.84	46.1
AAQ10	Near Project Site Village Udra From (Sundarbari Sand Ghat)	34.43	46.68	42.36	46.2
AAQ11	Near Project Site Village Belwa Kashipur From (Belwa Kashipur Sand Ghat)	38.47	46.43	43.5	46.43
AAQ12	Guthni From (Purandarpur Sand Ghat)	34.39	46.46	42.47	46.33
AAQ13	Indarpuri From (Sitajlhari Sand Ghat)	32.42	45.61	41.37	45.61
AAQ14	Bilayatibari From (Gambhirgadh Sand Ghat)	32.49	45.68	41.66	45.68

AAQ15	Hatamala From (Sundarbari Sand Ghat)	36.75	46.25	42.81	46.25

Table-3.10: Ambient Air Quality in the Study Area PM10

Location Code	PM10 (µg/m^3)				
	Name of the station	Min	Max	Average	98th Percentile
AAQ1	Near Project Site Village Kantu Bhast (from Palsa Sand Ghat)	64.75	79.57	69.99	77.72
AAQ2	Near Project Site Village Khanij Khaniabad from (Teragachh Sand Ghat)	69.08	79.82	75.15	78.91
AAQ3	Village Palsa (from Palsa Sand Ghat)	60.97	76.77	67.01	76.73
AAQ4	Phatbari From (Teragachh Sand Ghat)	65.57	75.08	69.21	73.63
AAQ5	Kanchanbari (from Palsa Sand Ghat)	69.79	75.01	72.67	74.9
AAQ6	Dhapartola From (Teragachh Sand Ghat)	69.79	75.66	72.04	75.25
AAQ7	Near Project Site Village Barahghara From (Purandarpur Sand Ghat)	69.13	75.28	71.4	75.1
AAQ8	Near Project Site Village Gharigora From (Gambhirgadh Sand Ghat)	68.75	82.24	72.83	80.74
AAQ9	Near Project Site Village Sitajlhari From (Sitajlhari Sand Ghat)	65.75	79.24	69.83	77.74
AAQ10	Near Project Site Village Udra From (Sundarbari Sand Ghat)	66.65	76.88	70.42	76.55
AAQ11	Near Project Site Village Belwa Kashipur From (Belwa Kashipur Sand Ghat)	65.25	80.07	70.49	78.22
AAQ12	Guthni From (Purandarpur Sand Ghat)	58.3	69.54	64.63	69.16

AAQ13	Indarpuri From (Sitajlhari Sand Ghat)	60.04	77.27	67.5	77.23
AAQ14	Bilayatibari From (Gambhirgadh Sand Ghat)	61.52	77.32	67.56	77.28
AAQ15	Hatamala From (Sundarbari Sand Ghat)	64.24	79.31	72.42	77.59

Table-3.11: Ambient Air Quality in the Study Area SO2

Location Code	**SO2 (µg/m^3)**				
	Name of the station	**Min**	**Max**	**Average**	**98th Percentile**
AAQ1	Near Project Site Village Kantu Bhast (from Palsa Sand Ghat)	7.47	10.7	8.25	9.87
AAQ2	Near Project Site Village Khanij Khaniabad from (Teragachh Sand Ghat)	7.09	11	9.23	10.78
AAQ3	Village Palsa (from Palsa Sand Ghat)	6.4	10.09	8.18	9.74
AAQ4	Phatbari From (Teragachh Sand Ghat)	7.2	10.89	8.98	10.54
AAQ5	Kanchanbari (from Palsa Sand Ghat)	8.23	11.67	9.72	11.57
AAQ6	Dhapartola From (Teragachh Sand Ghat)	6.97	11.22	8.64	10.61
AAQ7	Near Project Site Village Barahghara From (Purandarpur Sand Ghat)	7.75	11.39	10.09	11.35
AAQ8	Near Project Site Village Gharigora From (Gambhirgadh Sand Ghat)	6.62	15.33	10.43	13.58
AAQ9	Near Project Site Village Sitajlhari From (Sitajlhari Sand Ghat)	8.19	12.03	10.3	11.82
AAQ10	Near Project Site Village Udra From (Sundarbari Sand Ghat)	8.09	11.93	10.12	11.72
AAQ11	Near Project Site Village Belwa Kashipur From (Belwa	7.42	10.65	8.2	9.82

	Kashipur Sand Ghat)				
AAQ12	Guthni From (Purandarpur Sand Ghat)	3.9	7.22	5.11	6.96
AAQ13	Indarpuri From (Sitajlhari Sand Ghat)	6.67	10.04	8.17	9.69
AAQ14	Bilayatibari From (Gambhirgadh Sand Ghat)	6.34	10.03	8.12	9.68
AAQ15	Hatamala From (Sundarbari Sand Ghat)	8.17	11.61	9.66	11.51

Table-3.12: Ambient Air Quality in the Study Area NO2

Location Code	**NO2 (µg/m^3)**				
	Name of the station	**Min**	**Max**	**Average**	**98th Percentile**
AAQ1	Near Project Site Village Kantu Bhast (from Palsa Sand Ghat)	16.82	19.14	17.93	18.87
AAQ2	Near Project Site Village Khanij Khaniabad from (Teragachh Sand Ghat)	8.09	16.49	13.22	16.05
AAQ3	Village Palsa (from Palsa Sand Ghat)	12.98	16.88	15.06	16.85
AAQ4	Phatbari From (Teragachh Sand Ghat)	9.18	17.32	14.64	17.06
AAQ5	Kanchanbari (from Palsa Sand Ghat)	8.99	17	14.94	16.95
AAQ6	Dhapartola From (Teragachh Sand Ghat)	8.22	17.78	14.22	17.75
AAQ7	Near Project Site Village Barahghara From (Purandarpur Sand Ghat)	9.78	18.16	14.38	18.07
AAQ8	Near Project Site Village Gharigora From (Gambhirgadh Sand Ghat)	8.63	17.87	14.1	17.45
AAQ9	Near Project Site Village Sitajlhari From (Sitajlhari Sand Ghat)	8.13	17.98	13.7	17.7
AAQ10	Near Project Site Village dra From (Sundarbari Sand Ghat)	8.53	17.77	13.96	17.35

AAQ11	Near Project Site Village Belwa Kashipur From Belwa Kashipur Sand Ghat)	8.37	18.7	16.08	18.43
AAQ12	Guthni From (Purandarpur Sand Ghat)	8.55	14.94	11.35	14.32
AAQ13	Indarpuri From (Sitajlhari Sand Ghat)	9.1	17.32	14.92	17.29
AAQ14	Bilayatibari From (Gambhirgadh Sand Ghat)	8.93	17.37	14.14	17.34
AAQ15	Hatamala From (Sundarbari Sand Ghat)	9.48	17.49	14.84	17.44

3.3.4.1 Baseline Scenario

Particulate Matter (PM2.5)

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

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

PM2.5 recorded within the study area was in the range of **31.72 µg/m^3 to 47.18 µg/m^3.** Table 3.3 were compared with the National Ambient Air Quality Standards (NAAQS) and found that all sampling stations recorded in the study area are within the applicable limits i.e., 60µg/m^3 for $PM_{2.5}$ for industrial, residential, rural and other areas.

Suspended Particulate Matter (PM10)

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

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

The minimum and maximum level of PM10 recorded within the study area was in the range of **58.3 µg/m^{3}to 82.24** µg/m^3. The 24 hourly average values of PM10 were compared with the National Ambient Air Quality Standards (NAAQS) and found that all sampling stations recorded in the study area are within the applicable limits i.e., 100 µg/m^3 for PM10 in industrial, residential, rural and other areas.

Sulphur Dioxide (SO2)

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

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

Sulphur dioxide in atmosphere is significant because of its toxicity; Sulphur dioxide is capable of causing illness and lung injury. Further it can combine with water in the air to form toxic acid aerosols that can corrode metal surfaces, fabrics and the leaves of plants. Sulphur dioxide is an irritant to the eyes and respiratory system. Excessive exposure to Sulphur dioxide causes breathing related diseases as it affects the lungs.

The minimum and maximum concentration of SO_2 recorded within the study area was **3.90 µg/m^{3}to 15.33 µg/m^3.**

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

Oxides of Nitrogen (NO2)

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

- Emissions from vehicular movements in the study area.

Oxides of Nitrogen in the presence of sunlight will undergo reactions with a number of organic compounds to produce all the effects associated with photochemical smog. NO2 has inherent ability to produce deleterious effects by themselves like toxicity. It causes asphyxiation when its concentration is great enough to reduce the normal oxygen supply from the air. The minimum and maximum level of NO2 recorded within the study area was in the range of was **8.09 µg/m^{3}to 19.14 µg/m^3.**

The 24 hourly average values of NO_2 were compared with the National Ambient Air Quality Standards (NAAQS) and it was found that all sampling stations recorded values are below the applicable limits 80 µg/m^3 for Residential, Rural and other areas.

Ambient Air Quality in the Study Area, Free Silica

Location Code	Free silica (µg/m^3)		
	Name of the station	Min	Max
AAQ1	Near Project Site Village Kantu Bhast (from Palsa Sand Ghat)	1.30	1.82
AAQ2	Near Project Site Village Khanij Khaniabad from (Teragachh Sand Ghat)	1.24	1.72
AAQ3	Village Palsa (from Palsa Sand Ghat)	1.41	1.88
AAQ4	Phatbari From (Teragachh Sand Ghat)	1.51	1.79
AAQ5	Kanchanbari (from Palsa Sand Ghat)	1.38	1.83
AAQ6	Dhapartola From (Teragachh Sand Ghat)	1.44	1.95
AAQ7	Near Project Site Village Barahghara From (Purandarpur Sand Ghat)	1.45	1.88
AAQ8	Near Project Site Village Gharigora From (Gambhirgadh Sand Ghat)	1.41	1.75
AAQ9	Near Project Site Village Sitajlhari From (Sitajlhari Sand Ghat)	1.23	1.90
AAQ10	Near Project Site Village Udra From (Sundarbari Sand Ghat)	1.22	1.85
AAQ11	Near Project Site Village Belwa Kashipur From (Belwa Kashipur Sand Ghat)	1.54	1.75
AAQ12	Guthni From (Purandarpur Sand Ghat)	1.39	1.84
AAQ13	Indarpuri From (Sitajlhari Sand Ghat)	1.28	1.74
AAQ14	Bilayatibari From (Gambhirgadh Sand Ghat)	1.43	1.87
AAQ15	Hatamala From (Sundarbari Sand Ghat)	1.51	1.72

3.4 SOIL ENVIRONMENT

Soil may be defined as a thin layer of earth's crust, a medium for the growth of plants. The soil characteristics include both physical and chemical properties. The soil survey and soil sample were carried out / collected to assess the soil characteristics of the study area. Soil samples were collected from 08 locations and analyzed as per CPCB norms. The soil

sampling locations are marked in **Figure 3.5**and shown in **Table 3.12.** Thephysico-chemical characteristic of these soil samples is given in **Table 3.13.**

Table 3.13: Description of soil sampling locations

Soil monitoring locations		
SITE	**Location**	**Distance, direction**
SQ1	Village Palsa (from Palsa Sand Ghat)	654 meter, West
SQ2	Village Khanij Khaniabad from (Teragachh Sand Ghat)	182 meter, SW
SQ3	Village Baraghara From (Purandarpur Sand Ghat)	500 meter, East
SQ4	Village Gharigora) From (Gambhirgadh Sand Ghat)	373 meter, SE
SQ5	Village Sitajlhari) From (Sitajlhari Sand Ghat)	1.1 Km, SE
SQ6	Village Udra) From (Sundarbari Sand Ghat)	500 meter, SE
SQ7	Village Belwa Kashipur) From (Belwa Kashipur Sand Ghat)	342 meter, SE

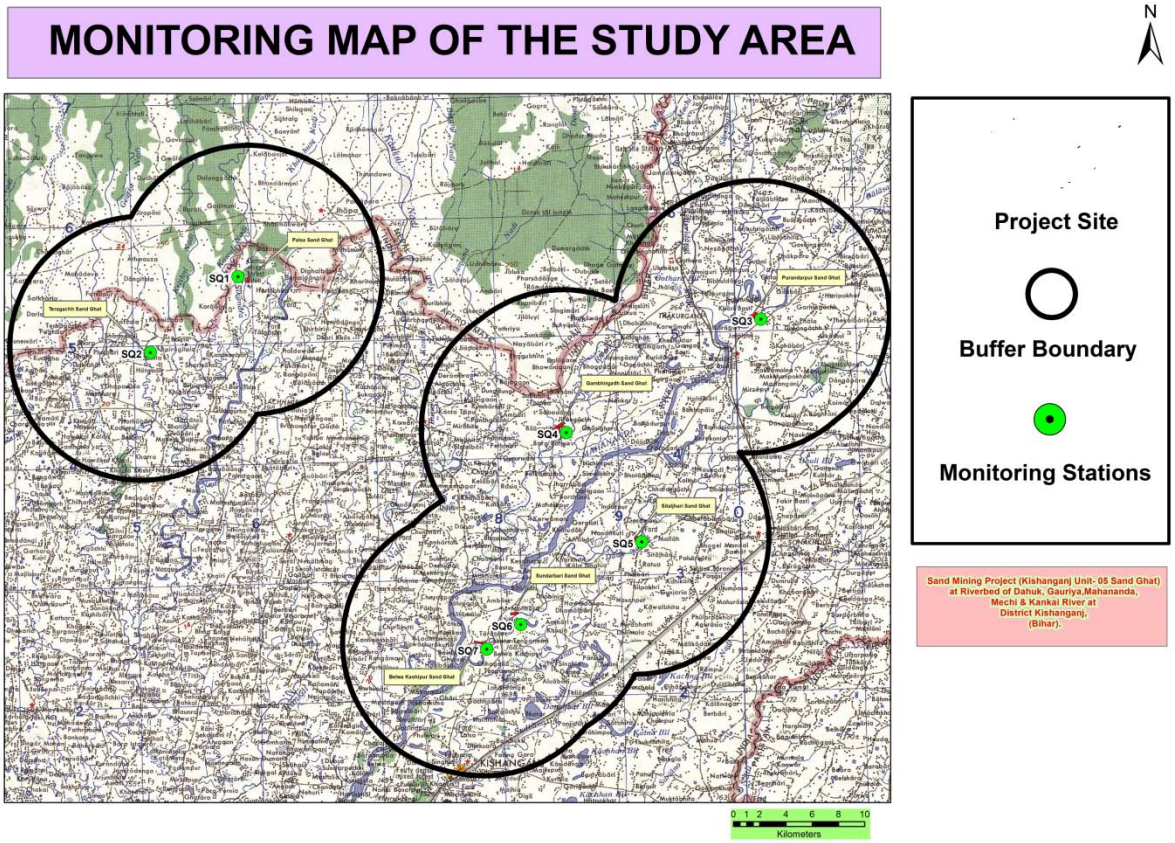


Figure 3.5, Soil Sampling Locations

Table 3.14 :Physico-chemical properties of soil

S.No	Parameter	Unit	SQ-1	SQ-2	SQ-3	SQ-4	SQ-5	SQ-6	SQ-7
1	Texture	-	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam
	Silt	%	13.2	7.52	10.0	6.89	3.79	13.39	12.05
	clay	%	16.7	13.88	17.5	16.7	11.0	13.7	9.4
	Sand	%	70.1	78.6	72.5	76.4	85.2	72.9	78.55
2	pH	-	7.87	8.16	8.15	7.39	7.85	8.24	8.37
3	Electrical Conductivity	µmhos /cm	199	188	166	180	168	170.0	165
4	Cation exchange capacity	Meq /100 gm	14.00	17.05	15.06	11.16	11.14	12.26	11.16
5	Potassium	mg/kg	60.57	65.1	61.6	65.7	61.5	62.5	60.8
6	Sodium	mg/kg	82.34	76.6	43.2	67.6	45.2	54.5	68.3
7	Calcium	mg/kg	2015.5	1905.6	2105	2102	1668	1675	2107

8	Magnesium	mg/kg	180.0	178.8	272.2	255.2	195.6	248	284
9	Sodium Absorption Ratio	-	0.52	0.72	0.58	0.24	0.18	0.38	0.34
10	Water Holding Capacity	%	32.5	31.6	33.8	32.2	24.6	29.4	26.0
11	Porosity	%	43.5	42.2	41.5	43.8	51.9	45.2	46.7

Observations:

Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from **7.39 to 8.37**, which shows that the soil is alkaline in nature.

3.5 NOISE ENVIRONNENT

The noise levels within the study area were recorded using Sound Level Meter and noise monitoring results were compared with the Ambient Noise Quality Standard notified under Environment Protection Act, 1986. The levels recorded are as stated in **Table 3.15.** The noise level monitoring locations are marked in**Figure 3.6**and shown in **Table 3.14.**

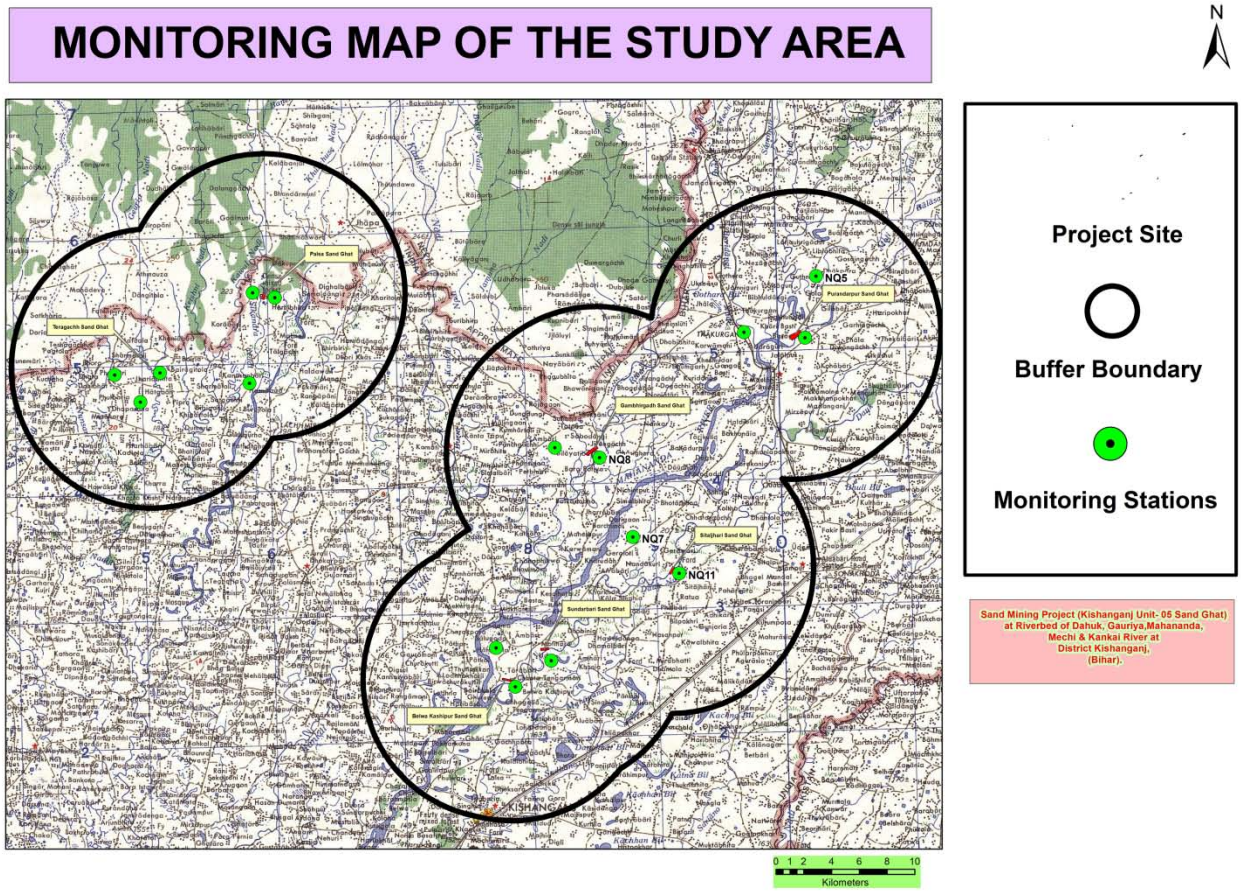


Figure 3.6 Noise Monitoring Stations

Table 3.15: NoiseQuality Monitoring Stations

SITE	Location	Distance, direction
NQ1	Near Project Site Village Kantu Bhast (from Palsa Sand Ghat)	500 Meters, East
NQ2	Near Project Site Village Khanij Khaniabad from (Teragachh Sand Ghat)	182 Meters, SW
NQ3	Village Palsa (from Palsa Sand Ghat)	654 Meters, West
NQ4	Phatbari From (Teragachh Sand Ghat)	2.50 Km, West
NQ5	Kanchanbari (from Palsa Sand Ghat)	8.00 Km,SE
NQ6	Dhapartola From (Teragachh Sand Ghat)	2.39 Km,SW
NQ7	Near Project Site Village Barahghara From (Purandarpur Sand Ghat)	500 Meters, East
NQ8	Near Project Site Village Gharigora From (Gambhirgadh Sand Ghat)	373 Meters, SE
NQ9	Near Project Site Village Sitajlhari From (Sitajlhari Sand Ghat)	500 Meters, East
NQ10	Near Project Site Village Udra From (Sundarbari Sand Ghat)	500 Meters, SW
NQ11	Near Project Site Village Belwa Kashipur From (Belwa Kashipur Sand Ghat)	342 Meters, SE
NQ12	Guthni From (Purandarpur Sand Ghat)	4.01 Km, NW
NQ13	Indarpuri From (Sitajlhari Sand Ghat)	3.5 Km, NW
NQ14	Bilayatibari From (Gambhirgadh Sand Ghat)	2.26 Km, West
NQ15	Hatamala From (Sundarbari Sand Ghat)	1.99 Km, West

Table 3.16: Noise Monitoring Results

S.No.	SITE	ZONE	Leq LIMIT (as per CPCB Guidelines), in dB(A)		Leq Value monitored, in dB(A)	
			DAY*	NIGHT*	DAY*	NIGHT*
1	NQ-1	Residential Zone	55	45	47.5	38.2
2	NQ-2	Residential Zone	55	45	46.8	35.8
3	NQ-3	Silence zone	50	40	40.1	32.9
4	NQ 4	Residential Zone	55	45	42.9	38.2
5	NQ 5	Residential Zone	55	45	39.5	35.9
6	NQ 6	Residential Zone	55	45	46.9	39.7
7	NQ 7	Residential Zone	55	45	40.4	36.4
8	NQ-8	Residential Zone	55	45	42.0	33.0
9	NQ-9	Residential Zone	55	45	41.5	32.5
10	NQ-10	Residential Zone	55	45	43.1	34.0
11	NQ-11	Residential Zone	55	45	44.2	37.1
12	NQ-12	Residential Zone	55	45	39.4	34.8
13	NQ-13	Residential Zone	55	45	43.9	37.7
14	NQ-14	Residential Zone	55	45	45.1	40.8
15	NQ-15	Residential Zone	55	45	38.4	34.0

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

Results

Noise monitoring reveals that the minimum & maximum noise levels at day time were recorded as **38.4dB(A) to 47.5 dB(A**) respectively. The minimum & maximum noise levels at night time were found to be **32.5dB (A) & 40.8dB**(A) respectively.

There are several sources in the 10 km radius of study area, which contributes to the local noise level of the area. On the commencement of the project, the sound from traffic activities

will add to the ambient noise level of the area. This will be kept under check by taking proper suggestive measures.

3.6 BIOLOGICAL ENVIRONMENT

3.6.1.1 Introduction

The ecological study reflects the potential of a regional ecosystem and its biological components. In India, the biological diversity of plants and animals varies from region to region on account of their diversity and density. Producers (plants), consumers (animals), and decomposers (microbes) govern the whole cycle of ecology. Plant and animals both are interdependent on each other.

The biological study is essential to understand the impact of any developmental project on the existing flora and fauna present in the study area. Hence, studies on various aspects of the ecosystem play an important role in identifying sensitive issues for undertaking appropriate action to mitigate the impact if required.

The Environment baseline data generation report in respect of flora-fauna has been prepared to assess the current ecology & biodiversity scenario of the area; and to carry out Environmental Management Plan based on the proposed project activities. The plan will identify and address the environmental and ecological conservation implications of the area. Conservation of biodiversity is essential for sustainable development.

The main objective of the ecological survey is aimed to find out the baseline status of flora and fauna (terrestrial and aquatic ecosystem) of the study area before the start of Sand Mining Project, on Dahuk, Gauriya, Mahananda, Mechi & Kankai River At Kishanganj Unit- 05 Sand Ghat.

3.6.2 Description of the study area

The Proposed Sand Mining Project was located on Dahuk, Gauriya, Mahananda, Mechi & Kankai River at Village- Ratua, Metihara Taluka, Belwa Kashipur, Hatgaon/Kamat, Sakhuadali, Tatpaua, Palsa, Anchal– Pothia, Kishanganj Tergachh, Thakurganj, Dighalbank District – Kishanganj, Bihar

3.6.2.1 Description of Eco-sensitive zones in the Study Area (Wildlife Sanctuary/ National Parks/Animal or Elephant Corridors/ Protected Wetlands etc.)

There are no National parks, Biosphere Reserves, Wildlife corridors, Tiger/Elephant reserves (existing as well as proposed), within 5 km from the present project**.**

Also, areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value are doesn't exist in the core and buffer zone of the present project. On the other hand, the proposed alignment will cross over some riverine channel in the core zone. Adequate structure for cross drainage shall be constructed in order to maintain the natural hydrology and protection of all forms of biota found there in all the water bodies of the area.Apart from the above, the proposed project the area will promote tourism activities due to the existing Beraila Wildlife Sanctuaries (Bird Sanctuary).

3.6.3 Drainage /Water Bodies of the Study Area

Apart from these, some seasonal (monsoon-fed) riverine streams and Nallas are also present in the study area. Few ponds are also recorded nearby the different villages mainly used for fish farming, Cattle feeding, Irrigation purpose by the villagers, etc.

Scope and Objectives of the Study

The above study aims in identifying potential impacts on flora and fauna and to suggest relevant compensatory and mitigatorymeasures to protect/conserve biodiversity in the likely impacted area due to the project activity. Following points to be covered under the scope of work:

- Survey of terrestrial & aquatic flora & fauna for core & buffer zone separately.
- Details of endemic species found in the study area and their IUCN status, Schedule status (as per WPA, 1972).
- Survey of the study area in terms of features like breeding &spawning grounds, habitats, flight paths, and the migratory path of the animals.
- Survey of flora covering types e.g. agriculture crop, commercial crop, plantation, natural vegetation/forest type, grass land. The endangered & endemic species of flora & fauna beside any other flora, if present are also to be identified.
- The survey has been coveringa total listing of the faunal population. The survey has also covered endangered, endemic, migratory & detail of aquatic fauna.
- The assessment of potential damage to terrestrial & aquatic flora and fauna. The impact should be categorized as primary & secondary, temporary and long term, unavoidable & risk transboundary impacts, possible irreversible change.

3.6.4 Methodology/ Data Collection

A primary field survey was carried out within a 10 km radius of the proposed project in pre monsoon period (March to May 2023). Both terrestrial and aquatic ecosystems have been

studied to understand the biological environment. Secondary data were collected from authentic sources like the Forests Department, Fisheries Department, Agriculture Department, and available published literature.

3.6.5 Flora (Aquatic and Terrestrial)

For the collection of data for aquatic flora, the methodology prescribed in the standard book of Adoni (1985), NEERI (1998), and APHA (2015) has been adopted. A total of 05 sampling sites were selected for the collection of samples to analyze the aquatic flora.

On the other hand, for the terrestrial data, community analysis was carried out during the summer season. For the collection of terrestrial data, a total of 05 sampling points were selected. At every sampling site, quadrates of 10m X 10m (100 sq.m.) size were randomly laid to study tree species. The circumference of all the adult individuals [(≥30 cm circumference at breast height (CBH)] was measured with Freeman's tape. The study of communities was carried out by using qualitative characteristics, and quantitative characteristics. Qualitative characteristic mainly involved presence/absence of the species, genera, and family. This showed the community structures, composition and other characteristic can be readily described by visual observation without actual measurements. The quantitative analysis involved the structure and composition of vegetation across vegetation types and compared in terms of frequency, density, abundance, and basal area of tree species.

3.6.6 Fauna (Aquatic and Terrestrial)

For the collection of data for aquatic fauna, the methodology prescribed in the standard book of Adoni (1985), NEERI (1998), and APHA (2015) has been adopted. A total of 05 sampling points were selected for the collection of samples to identify the the aquatic fauna.

On the other hand, for the terrestrial data,the assessment of fauna was done by an extensive field survey in the area at 05 locations. During the survey, the Line Transect method was used for the study of mammals and Transact & Patch sampling were used for Amphibians, visual encountered methods was used for reptiles and butterflies. The presence of wildlife was also confirmed from the animal calls, footmarks, excreta, and from the local inhabitants depending on the animal sightings and the frequency of their visits in the project area which was later confirmed from the different government offices like the forest department or wildlife department, etc.

Observations of birds were made during a walk-through in the chosen transect for sighting birds. The number of birds observed in each sampling location was listed. Birds were noted and identified with the help of binocular and standard field identification guides.

3.6.7 Sampling Sites

A total of 05 samplingsitewere selected for the terrestrial vegetation, avian fauna, and other terrestrial animals like reptiles, mammals, etc. For the collection of samples and data of aquatic flora and fauna, 05 separate sampling sites were also selected at different locations in the study area.

3.6.8Flora of the Study Area

The core zone of the proposed project area doesn't have any major natural forest land.

A major part of the core and buffer zone of the project is agricultural land having some major vegetation in the form of agro forestry. Vegetation patterns in villages and surrounding areas are slightly different from the rest of the areas in the Kishanganj District. The common species grown near the villages are mostly edible, fruits bearing or useful plants. Purposely planted tree patches (mostly fruit-bearing) are available nearby several villages in the study area. The most dominant tree species in the study area are *Aegle marmelos* (Bel), *Azadirachta indica* (Neem), *Emblica officinalis* (Amla), *Dalbergia sissoo* (Sisam), *Ficus bengalensis* (Bargad), *Musa paradisiacal* (Kela), *Syzygiumcumini* (Jamun), *Cassia siamea* (Kasod/Siris), *Litchi chinensis* (Litchi), *Mangifera indica* (Aam) and in case of shrubs *Antigonum leptopus*, *Ricinus communis*, *Lantana camara*, *Jatropha gossipifolia* and *Cassia auriculata* etc. The most dominant species in the study area of both the district was *Mangifera indica* (Aam) and its different varieties.

3.6.9 Flora of Core zone

3.6.9.1 Terrestrial Flora of Core zone (Natural vegetation etc.).

There is no flora found in the core zone

3.6.9.2 Agricultural Crops/ Commercial Crops of the Core zone and Buffer Zone

Details of the agricultural vegetation and commercial crops were collected from the 09 selected sites of the core (Kishanganj district)and the details are given in table 4. These crops are similar to the crops of buffer zone also. So, the same information is applicable for the core and buffer zone.

Table 3.18: List of Crops seasonally planted by respective farmers in the Core and Buffer Zone

S.No.	**Botanical Name**	**Local/Trade Name**	**Family Name**
1	*Zey mays*	Makkha/Maize	Poaceae

2	*Triticum aestivum*	Wheat	
3	*Oryza sativa*	Paddy	
4	*Cicer arietinum*	Channa	Fabacea
5	*Coriander sativum*	Dhaniya	Apiaceae
6	*Abelmoschus esculentus*	Bhendi	Amaranthacea
7	*Mamordica charanta*	Karela	Cucurbiataceae
8	*Capsicum annum*	Mirchi	Solanaceae
9	*Lycopersicon lycopersicum*	Tomato	
10	*Solanum melongena*	Brinjal	
11	*Capsicum annuum*	Mirchi	
12	*Solanum tuberosum*	Potato	
13	*Allium cepa*	Onian	Amaryllidaceae
14	*Cajanus cajan*	Pigeon pea	Fabaceae
15	*Carica papaya*	Papaya	Caricaceae
16	*Okra*	Ladyfinger/ Bhindi	Malvaceae
17	*Lagenaria siceraria*	Bottle gourd/ Lauki	Cucurbitaceae
	Source: Present Survey Data Supported by District Agriculture Department		

3.6.9.3 Aquatic Flora of Core zone (Phytoplankton/ Macrophytes).

Aquatic floral details of the core zone were collected from 08 selected sites of the study area.Some sites were located buffer zone adjacent to the present alignment, however some were located in the core & buffer zone. Details of phytoplankton and macrophytic vegetation of the core and the buffer zone are given in tables.

Phytoplankton: Most of thethe phytoplankton species recorded from the core zone was similar to the buffer zone also. So, the same information is applicable for the core and buffer zone. Phytoplankton species were collected and identified from 08 selected sampling sites of the study area. A total of 69 phytoplankton species were recorded from the different water bodies of the study area, out of which 27 species were of class Chlorophyceae, 17 species of Cyanophyceae, 19 species of Bacillariophyceae, and 6 species of Euglenophyceae. Details of Phytoplankton species are given in table 3.19.

Table 3.19: List of Phytoplankton species present in different water bodies in study area (Core and Buffer Zone).

S.N.	Taxonomic Details	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	Schedule Status in WPA (1972)	IUCN Status
	Chlorophyceae									NA	NA
1	*Arthrodesmus* sp.	+		+	+		+		+	NA	NA
2	*Ankistrodesmus falcatus*		+	+			+	+	+	NA	NA
3	*Chlorococcum* sp.	+	+	+			+		+	NA	NA
4	*Closteriopsis* sp.	+	+		+	+		+		NA	NA
5	*Cosmarium formii*	+	+	+	+	+	+		+	NA	NA
6	*Cosmarium margaritatum*	+		+	+		+	+		NA	NA
7	*Crucigenia* sp.	+	+	+	+		+			NA	NA
8	*Chlorella vulgaris*	+		+	+	+			+	NA	NA
9	*Oocystis crassa*	+	+			+	+	+	+	NA	NA
10	*Pediastrum simplex*			+	+	+				NA	NA
11	*Scenedesmus armatus*	+	+	+		+	+	+	+	NA	NA
12	*Scenedesmus bijugatus*	+		+	+	+	+		+	NA	NA
13	*Spirogyra* sp.	+	+	+		+	+	+		NA	NA
14	*Tetraedron trigonum*				+		+		+	NA	NA
15	*Tetrastrum* sp.	+	+	+		+	+		+	NA	NA
16	*Ulothrix* sp.	+	+	+	+	+	+	+		NA	NA
17	*Ulothrix zonata*	+		+		+	+		+	NA	NA
18	*Volvox* sp.	+	+	+		+	+			NA	NA
	Total	19	**15**	**23**	**16**	**17**	**24**	**12**	**17**		
	Cyanophyceae									NA	NA
1	*Anabaena* sp.		+	+	+	+	+		+	NA	NA
2	*Anabaena circinalis*	+	+	+	+	+	+	+		NA	NA
3	*Aphanocapsa* sp.	+		+	+	+	+	+	+	NA	NA
4	*Aphanothece* sp.	+	+		+	+			+	NA	NA
5	*Chroococcus* sp.	+		+	+	+	+	+		NA	NA
6	*Gloeocapsa* sp.	+	+	+			+		+	NA	NA

7	*Lyngbya* sp.	+	+		+	+	+	+	+	NA	NA
8	*Merismopedia* sp.	+	+	+		+	+	+	+	NA	NA
9	*Merismopedia tenuissima*	+		+	+	+	+			NA	NA
10	*Microcystis* sp.		+		+			+	+	NA	NA
11	*Microcystis aeruginosa*	+		+			+			NA	NA
12	*Nostoc* sp.		+		+	+	+	+	+	NA	NA
	Total	**12**	**11**	**11**	**12**	**13**	**15**	**9**	**12**		
	Bacillariophyceae									NA	NA
1	*Amphora ovalis*	+				+	+		+	NA	NA
2	*Amphora* sp.	+	+	+	+	+		+		NA	NA
3	*Cyclotella* sp.			+		+	+	+	+	NA	NA
4	*Cymbella affinis*	+		+	+		+		+	NA	NA
5	*Eunotia major*	+	+		+	+		+		NA	NA
6	*Fragillaria pinnata*		+	+		+	+		+	NA	NA
7	*Gomphonema* sp.	+			+		+	+	+	NA	NA
8	*Gomphonema lanceolatum*	+	+	+	+	+			+	NA	NA
9	*Melosira* sp.	+	+	+	+	+	+			NA	NA
10	*Navicula similis*	+	+	+	+		+	+	+	NA	NA
11	*Navicula subrhyncocephala*	+	+		+		+		+	NA	NA
12	*Nitzschia palea*	+	+		+	+	+			NA	NA
13	*Pinnularia sp.*	+	+	+				+	+	NA	NA
14	*Synedra acus*	+				+	+		+	NA	NA
15	*Synedra ulna*		+		+	+	+	+	+	NA	NA
	Total	**16**	**12**	**9**	**13**	**11**	**15**	**10**	**13**		
	Euglenophyceae									NA	NA
1	*Euglena acus*	+	+	+	+	+	+	+	+	NA	NA
2	*Euglena* sp.	+			+	+	+		+	NA	NA
3	*Euglepha* sp.	+	+	+	+	+	+	+	+	NA	NA
4	*Phacus* sp.		+				+			NA	NA
5	*Phacus caudatus*	+			+	+	+	+	+	NA	NA
6	*Trachelomonas* sp.	+	+	+	+	+	+	+		NA	NA
	Total	**5**	**4**	**3**	**5**	**5**	**6**	**4**	**4**		
	Source: Primary Survey Data of P&M Solution Pvt. Ltd., Noida										

Table 3.20: Site wise Qualitative list of Phytoplankton species recorded from the Core and Buffer Zone

Class	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8
Chlorophyceae	19	15	23	16	17	24	12	17
Bacillariophyceae	16	12	9	13	11	15	10	13
Euglenophyceae	5	4	3	5	5	6	4	4
Total No. of Species	**52**	**42**	**46**	**46**	**46**	**60**	**35**	**46**

Macrophytes: The aquatic vegetation recorded from the core zone was similar to the aquatic vegetation of the buffer zone also. So, the same information is applicable for the core and buffer zone.The maximum number of aquatic vegetation was recorded at sites 06 and 08 due to the perennial nature of the water bodies. On the other hand, other water bodies support less vegetation due to a lack of water (monsoon-fed streams), and moisture. The details of Macrophytes species are given in table 3.21.

Table 3.21: List of Aquatic Macrophytic vegetation of Core and Buffer Zone

S.No.	Name of the Taxa	Family Name	IUCN Status	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8
1	*Azolla pinnata*	Salviniaceae	LC	+	+	+	+	+	+	+	+
2	*Cyperus alopecuroides*	Cyperaceae	LC	+	+			+	+	+	+
3	*Cyperus difformis*	Cyperaceae	LC	+		+	+		+	+	+
4	*Eichhornia crassipes*	Pontederiaceae	LC	+	+	+		+	+		+
5	*Hydrilla verticillata*	Hydrocharitaceae	LC				+			+	+
6	*Ipomea aquatica*	Convolvulaceae	LC		+	+	+	+	+		+
7	*Ipomea carnea*	Convolvulaceae	LC	+	+	+	+		+	+	+
8	*Lemna minor*	Araceae	LC	+	+			+	+	+	+
9	*Ludwigia parviflora*	Onagraceae	LC	+	+	+	+		+	+	+
10	*Nelumbo sp.*	Nelumbonaceae	LC		+			+			
11	*Nymphoides aquatica*	Menyanthaceae	LC	+		+		+	+	+	+
12	*Phragmites karka*	Poaceae	LC						+		

13	*Pistia stratiotes*	Araceae	LC		+		+			+	+
14	*Polygonum glabrum*	Polygonaceae	LC	+	+	+		+	+	+	+
15	*Typha latifolia*	Typhaceae	LC						+		+
16	*Typha orientalis*	Typhaceae	LC		+		+	+	+	+	
Total No. of Species				**9**	**8**	**8**	**8**	**9**	**13**	**11**	**13**

3.6.10 Flora of Buffer zone

3.6.10.1 Terrestrial Flora of Buffer zone (Natural vegetation/Commercial vegetation).

During the present survey,a total of 77 species of plant species were observed from the study area. Out of 77 plant species,42species of tree, 18 species of shrubs/herbs, 6 species of climbers, and 10 species of Grass species were recorded from the buffer zone of the present study area. The below-mentioned vegetation details have been collected from the Core as well as Buffer zone of the present study area. All the details have been furnished based on the field survey at different locations and data supported by the Department of Forest, Kishanganj of Bihar. The details of vegetation of the buffer zone is given in Table 3.22.

Table 3.22: List of Trees, Shrubs, Herbs and Grasses observed in Buffer Zone

S.No.	Botanical Name	Common/ Hindi Name	Name of family
	Trees		
1	*Acacia nilotica*	Babool	Mimosaceae
2	*Acacia nilotica*	Desi babool	Fabaceae
3	*Acacia leucophloea*	Safed babul	Mimosaceae
4	*Aegle marmelos*	Bel	Rutaceae
5	*Ailanthus excels*	Adusa	Simaroubaceae
6.	*Albizzia amara*	Siris	Mimosoideae
7	*Albizzia lebbeck*	Sirish	Mimosaceae
8	*Alstonia scholaris*	Saptaparni	Apocynaceae
9	*Anogeissus latifolia*	Dhaura,	Combretaceae
10	*Anthocephalus cadamba*	Kadamb	Rubiaceae
11	*Artocorpus heterophyllus*	Jack fruit	Moraceae
12	*Azadirachta indica*	Neem	Meliaceae
13	*Bauhinia racemosa*	Apta	Leguminosae

14	*Bauhinia variegata L.*	Kachnar	Leguminosae
15	*Bombax ceiba*	Semal	Malvaceae
16	*Bombax malabaricum*	Semal tree	Malvaceae
17	*Borassus flabellifer*	Nariyal	Palmae
18	*Butea monosperma*	Palas	Leguminosae
19	*Dalbergia latifolia*	Shisam	Leguminosae
20	*Dalbergia sissoo*	Shisam	Leguminosae
21	*Delonix regia*	Gulmohar	Fabaceae
22	*Dendrocalamus strictus*	Bamboo	Poaceae
23	*Diospyros melanoxylon*	Tendu	Ebenaceae
24	*Ficus benghalensis*	Bargad	Moraceae
25	*Ficus religiosa*	Pipal	Moraceae
26	*Madhuca longifolia*	Mohua tree	Sapotaceae
27	*Magnifera indica*	Aam	Anacardiaceae
28	*Melia azedarach*	Bukkam Neem	Meliaceae
29	*Moringa olerifera*	Munga	Moringanaceae
30	*Nerium oleamder*	Kaner	Apocynaceae
31	*Phoenix sylvestris*	Date palm	Arecaceae
32	*Phyllanthus emblica*	Awla	Euphorbiaceae
33	*Pisidium guava*	Guava	Myrtaceae
34	*Pongamia pinnata*	Karanj	Leguminosae
35	*Prosopis juliflora*	Vilayati babool	Fabaceae
36	*Sarracca indica*	Ashok	Annonaceae
37	*Shorea robusta*	Sal	Depterocarpaceae
38	*Syzygium cumini*	Jamun	Myrtaceae
39	*Tectona grandis*	Sagwan	Verbenaceae
40	*Terminalia arjuna*	Arjun	Combretaceae
41	*Terminalia chebula*	Harhar	Combretaceae
42	*Zizyphus jujube*	Ber	Rhamnaceae
Shrub & Herbs			
43	*Acanthospermum hispidum*	Kanti	Asteraceae
44	*Acheranthus aspera*	Aghada	Amaranthaceae
45	*Argemone mexicana*	Pila dhtura	Papaveraceae

46	*Baugainvellia glabra*	Paper flower	Nyctaginaceae
47	*Calotropis procera*	Aakra	Asclepiadaceae
48	*Cassia auriculata*	Tarwar	Fabaceae
49	*Cassia tora*	Tarota /Takla	Caesalpiniaceae
50	*Chenopodium album*	manure weed	Amaranthaceae
51	*Dalura metel*	Dhotra	Solanaceae
52	*Ipomoea carnea*	Besharam	Convolvulaceae
53	*Jatropha gossipifolia*	cotton-leaf	Euphorbiaceae
54	*Lantana camara*	Ghaneri	Verbenaceae
55	*Mimosa pudica*	Chui Mui	Mimosaceae
56	*Ocimum sanctum*	Tulsi	Labiatae
57	*Parthenium hysterophorus*	Gajar grass	Asteraceae
58	*Ricinus communis*	Arand	Euphorbiaceae
59	*Ricinus communis*	castor oil plant	Euphorbiaceae
60	*Tridax procumbens*	Kambarmodi	Asteraceae
Grasses			
61	*Apluda mutica*	Mauntian grass	Poaceae
62	*Commelina benghalensis*	Bokna	Commelinaceae
63	*Cynodon dactylon*	Doob	Poaceae
64	*Cyperus rotundus*	Motha	cyperaceae
65	*DactylSeptemberenum aegyptium*	Crow foot grass	Poaceae
66	*Pennisetum purpureum*	Elephant grass	Poaceae
Climbers			
67	*Antigonon leptopus*	Anantalata	Polygonaceae
68	*Bougainvillea glabra*	Booganbel	Nyctaginaceae
69	*Celastrus paniculata*	Kujari	Celastraceae
70	*Cissampelos pareira*	Khariya lata	Menispermaceae
71	*Clitoria ternatea*	Blue pea	Fabaceae
72	*Coccinia grandis*	Jungli Kundru	Cucurbitaceae
73	*Combretum indicum*	Madhu Malati	Combretaceae
74	*Cuscuta reflexa*	Amarbel	Convolvulaceae
75	*Cuscuta reflexa*	Amar bel	Convolvulaceae
76	*Ipomoea cairica*	Neeli Bel	Convolvulaceae

77	*Tilospora cordifolia*	Giloy	Menispermaceae

Source: Primary data of P&M Solution, Noida and data supported by the Department of Forest, Kishanganj district of Bihar**.**

3.6.10.2 Agricultural vegetation/ Commercial vegetation of the Buffer zone.

The variety of Crops and cropping patternsin the core and the buffer zone was the same in the study area. Vegetation details of the buffer zone were collected from 05 selected sites (TS-1 to TS-05)and the details are given in Table 3.17.

3.6.10.3 Aquatic Flora of Buffer zone (Phytoplankton/ Macrophytes/ Aquatic Weeds)

Phytoplankton: The diversity of Phytoplankton species was similar in the core and buffer zone. The details of macrophytic vegetation of the buffer zone are given in Table 3.19 & 3.20 and Figure 3.10.

Macrophytes: The diversity of aquatic macrophytes was similar in both core and buffer zone. The details of macrophytic vegetation of the buffer zone are given in Table 3.21 and Figure 3.11.

3.6.11 Fauna of the Study Area

Proposed alignment passing through the rural and purely in the agricultural field. At some places, it will cross from adjacent to some villages in the study area. The study area is devoid of any natural forest, so, major wildlife animals are rarely found in the area. Only some moving animals were observed. Domesticated animals mainly constitute the faunal population within the project area.

The assessment of fauna was done on the bases of secondary data collected from different government offices like the forest department, wildlife department, etc. The presence of wildlife was also confirmed by the local inhabitants depending on the animal sightings and the frequency of their visits in the project area.

During the present study period, a large number of local birds are noticed in the buffer zone of the study area. But, there are no bird habitats like nesting, breeding, and foraging patterns are noticed in the core zone.

3.6.12 Fauna of the Core Zone

3.6.12.1 Terrestrial fauna of core zone (Mammals/Reptiles/amphibians/birds/insects etc.).

The domesticated animals like; Buffalo (*BuSands bubalis*); Ass (*Equus hemionus*) , Cow (*Bos primigenius)*; Goat (*Capra aegagrus*) Horse (*Equus caballus*); and Dog (*Canis lupus familaris*) were observed moving in different parts of the study area (including core and buffer zone),especially nearby town and villages. Other mammals and reptiles found in the study area are listed in Table 3.23.

Table 3.23: List of Mammals/Reptiles/Amphibians/Birds recorded from the Core Zone

S. No.	Common Name	Scientific Name	Family	Schedule status (as per WPA-1972)	IUCN status
Mammals					
1.	Jungle cat	*Fellis chaus*	Felidae	II	LC
2.	Five striped palm squirrel	*Funambulus pennanti*	Sciuridae	IV	LC
3.	Indian Fulvous Fruit-Bat	*Rousettus leschenaultia*	Pteropodidae	V	LC
4.	Indian Field Mouse	*Mus booduga*	Muridae	V	LC
5.	Common House Rat	*Rattus rattus*	Muridae	V	LC
6.	Bandicoot Rat	*Bandicotabengalensis*	Muridae	V	LC
7.	Indian Grey Mongoose	*Herpestesedwardsi edwardsi*	Herpestidae	II	LC
Reptiles & Amphibians					
8.	Garden lizard	*Calotes versicolor*	Agamidae	IV	NE
9	King cobra	Ophiophagus hannah	Elapidae	II	LC
10	Cobra	Naja naja	Elapidae	II	LC
11.	Pit viper	Crotolus sp	Viperadae	II	LC
12	Garden lizard	Calotes versicolor	Agamidae	IV	NE
Bird Species					
1	*Acridotheres tristis*	Myna	Sturnidae	IV	LC

2	*Acridotheres tristis*	Common myna	Sturnidae	IV	LC
3	Amandava amandava	Red munia	Estrildidae	IV	LC
4	*Ardea cinerea*	Grey heron	Ardeidae	IV	LC
6	Bubulcus ibis	Cattle egret	Ardeidae	IV	LC
7	*Columba livia*	Pigeon	Columbidae	IV	LC
5	*Corvus macrorhynchos*	Jungle crow	Corvidae	IV	LC
6	*Corvus splendens*	Crow	Corvidae	V	LC
7	*Gallinule chloropus*	Common moorhen	Rallidae	IV	LC
8	*Milvus migrans*	Black Kite	Accipitridae	IV	LC
9	*Passer domesticus*	House sparrow	Passeridae	IV	LC
10	*Pycnonotus cafer*	Red-vented bulbul	Pycnonotidae	IV	LC
11	Saxicoloides fulicatus	Indian robin	Psittaculidae	IV	LC
12	*Turdoides caudate*	Common babbler	Leiothrichidae	IV	LC
IUCN Status =LC: Least Concern**, NE:** Not Evaluated.					
Source: Primary Survey data of P&M Solution, Noida and the data supported by Department of Forest, district of Bihar					

Table 3.24: Butterflies observed in the Core zone

S. No.	Common Name	Scientific Name	Family	IUCN Status
1.	Plain Tiger	*Danaus chrysippus*	Nymphalidae	LC
2.	Common emigrant	Catopsilia pomona	Pieridae	LC
3.	Common crow	*Euploea core*	Nymphalidae	LC
4.	Small grass yellow	Eurema brigitta	Pieridae	LC
Source: Primary Survey data of P&M Solution, Noida and the data supported by Department of Forest, district of Bihar				

3.6.12.3 Aquatic Fauna of Core zone (Zooplankton/ Macro-invertebrates/ Fishes/ Amphibians/ Turtles etc.)

All the aquatic fauna recorded from the core zone were also recorded from the buffer zone and most of the sampling sites are the same for the core and buffer zone as given in table

3.17. So, the list of aquatic fauna of the core zone is merged with the details of the buffer zone and is given in Table 3.25 to 3.27.

3.6.12.4 Fauna of Buffer zon

To prepare a detailed report on the status of faunal biodiversity of the present study area (1 km buffer) of Kishanganj district of Bihar and to assess the impacts due to digging/ leveling of alignment route/ construction of bridge/ operational activity which evolves suitable mitigation measures to protect & conserve biodiversity following components were studied: terrestrial biodiversity, wildlife survey (diversity), habitat study (feeding, breeding, roosting areas), distribution of birds, rare & endangered species of the study area.

The fauna of the study area (Core and Buffer zone) vary upon the local topography and different types of habitats. The fauna of the study area has been categorized into two categories based on their habitat, i.e.

(i) Aquatic fauna and

(ii) Terrestrial fauna.

During the present survey, there are some seasonal, perennial and private water body was observed along with the proposed alignment, which will be affected due to the present project activities. The alignment of the project will cross a few seasonal and perennial streams.

3.6.12.6 Terrestrial Fauna of Buffer zone (Mammals/Reptiles/Amphibians/Birds/ Insects etc.)

The major part of the study area lies under agricultural fields and barren land which restricts the wildlife habitat significantly. There is neither any wildlife sensitive area nor any corridor for the movement of wildlife in the study area. A list of the animals of the study area has been prepared on the basis of the survey and also inquire from the local people. The animals, thus recorded were cross-checked with Wildlife (Protection) Act, 1972 for their schedule status. Faunal details of thestudy area are given in Tables 3.25 to 3.27**.**

i. Mammals and Reptiles/ Amphibians

The domesticated animals like Goat (*Capra aegagrus*); Buffalo (*BuSands bubalis*); Cow (*Bos primigenius)*; Horse (*Equus caballus*); Ass (*Equus hemionus*) and Dog (*Canis lupus*

familaris) were observed moving in different parts of the study area, especially nearby town and villages. Other mammals and reptiles found in the study area are listed in Table 3.25.

Table 3.25: List Mammals, Reptiles and Amphibians recorded from the Buffer Zone

S. No.	Common Name	Scientific Name	Family	Status as per WPA-1972	IUCN status
Mammals					
1	*Bandicota bengalensis*	Bandicoot Rat	Sciuridae	IV	LC
2	*Canis aurius*	Jackal	Pteropodidae	V	LC
3	*Fellis chaus*	Jungle cat	Soricidae	IV	LC
4	*Funambulus palmarum*	Three-striped Squirrel	Suidae	III	LC
5	*Funambulus pennanti*	Five striped palm squirrel	Hyaenidae	III	LC
6	*Herpestes edwardsi*	Indian Grey Mongoose	Canidae	II	LC
7	*Hyaena hyaena*	Stripped hyena	Leporidae	V	LC
8	*Lepus nigricollis*	Indian Hare	Canidae	II	LC
9	*Mus booduga*	Indian Field Mouse	Sciuridae	IV	LC
10	*Presbytis entellus*	Common langur	Cercopithecidae	II	LC
11	*Pteropus giganteus*	Indian Flying Fox	Pteropodidae	V	LC
12	*Rattus rattus*	Common House Rat	Muridae	V	LC
13	*Rousettus leschenaultia*	Indian Fulvous Fruit- Bat	Muridae	V	LC
14	*Suncus murinus*	Grey musk Shrew	Muridae	V	LC
15	*Sus scrofa*	Wild Boar	Canidae	III	LC
16	*Vulpes bengalensis*	Indian fox	Felidae	II	LC
Reptiles and Amphibians					
1	*Bufo melanostictus*	Common toad	Bufonidae	IV	LC
2	*Bungarus caeruelus*	Krait	Elapidae	IV	NE
3	*Calotes versicolor*	Garden lizard	Agamidae	IV	NE

4	*Crotolus* sp.	Pit viper	Viperadae	II	LC
5	*Enhydris enhydris*	Smooth water snake	Homalopsidae	IV	LC
6	*Euphlyctis hexadactyla*	Common frog	Dicroglossidae	IV	LC
7	Hemidactylus flaviviridis	House Gecko	Gekkonidae	--	NE
8	*Naja naja*	Cobra	Elapidae	II	LC
9	Ophiophagus hannah	King cobra	Elapidae	II	LC
10	Ptyas mucosa	Rat Snake	Colubridae	II	NE
11	Rana temporaria	Common frog	Ranidae	IV	LC
12	Varanus sp.	Monitor lizzard	Varanidae	II	LC

IUCN Status =LC: Least Concern**, VU:** Vulnerable. **NT:** Near Threatened**, NE:** Not Evaluated**, Source:**Primary Survey data of P&M solution, Noida and the data supported by Department of Forest, District.

ii. Avian Fauna

Table 3.26: Avian Fauna observed from the study area (01 KM Buffer area)

S.No	Scientific Name	Common Name	Family	Schedule Status (WPA-1972	IUCN Status
1	*Acridotheres tristis*	Myna	Sturnidae	IV	LC
2	*Acridotheres tristis*	Common myna	Sturnidae	IV	LC
3	Alcedo atthis	Small blue kingfisher	Alcedinidae	IV	LC
4	Amandava amandava	Red munia	Estrildidae	IV	LC
5	*Ardea cinerea*	Grey heron	Ardeidae	IV	LC
6	Ardeola grayii	Indian pond heron	Ardeidae	IV	LC
7	Athene brama	Spotted Owlet	Strigidae	IV	LC
8	Bubulcus ibis	Cattle egret	Ardeidae	IV	LC
9	*Centropus sinensis*	Crow pheasant	Cuculidae	IV	LC
10	*Ceryle rudis*	Pied kingfisher	Alcedinidae	IV	LC
11	*Charadrius dubius*	Little ringed plover	Charadriidae	IV	LC

12	*Ciconia episcopus*	White-necked stork	Ciconidae	IV	NT
13	Cinnyris asiaticus	Purple Sunbird	Psittaculidae	IV	LC
14	*Columba livia*	Pigeon	Columbidae	IV	LC
15	*Corvus macrorhynchos*	Jungle crow	Corvidae	IV	LC
16	*Corvus splendens*	Crow	Corvidae	V	LC
17	*Dicrurus adsimilis*	Black drango	Dicruridae	IV	LC
18	Egretta alba	Larger egret	Ardeidae	IV	LC
19	*Egretta garzetta*	Little egret	Ardeidae	IV	LC
20	*Francolinus pondicerianus*	Titar	Phasianidae	IV	LC
21	*Gallinule chloropus*	Common moorhen	Rallidae	IV	LC
22	*Gallus gallus*	Jungle hen	Phasianidae	IV	LC
23	*Halcyon smymensis*	White-throated kingfisher	Alcedinidae	IV	LC
24	*Milvus migrans*	Black Kite	Accipitridae	IV	LC
25	*Passer domesticus*	House sparrow	Passeridae	IV	LC
26	*Phalacrocorax carbo*	Great cormorant	Phalacrocoracidae	IV	LC
27	*Phalacrocorax niger*	Little cormorant	Phalacrocoracidae	IV	LC
28	*Pluvialis fulva*	Pacific golden plover	Charadriidae	IV	LC
29	*Pseudibis papillosa*	Red-naped ibis	Threskiornithidae	IV	LC
30	*Psittacula krameri*	Rose ringed Parakeet	Psittacidae	IV	LC
31	*Pycnonotus cafer*	Red-vented bulbul	Pycnonotidae	IV	LC
32	Saxicoloides fulicatus	Indian robin	Psittaculidae	IV	LC
IUCN Status =LC: Least Concern**, VU:** Vulnerable.					
Source: Primary Survey data of P&M Solution and the data supported by Department of Forest, , Bihar.					

iii. Butter Flies

Table 3.27: Butterflies observed from the Buffer zone of the study area

S.No.	Scientific Name	Common Name	Family	IUCN Status
1	*Catopsilia pomona*	Common emigrant	Pieridae	LC

2	*Chlosyne lacinia*	Sunflower/Bordered Patch	Nymphalidae	LC
3	*Danaus chrysippus*	Plain Tiger	Nymphalidae	LC
4	*Danaus genutia*	Stripped Tiger	Nymphalidae	LC
5	*Euploea core*	Common crow	Nymphalidae	LC

Source: Primary Survey data of P&M Solution and the data supported by Department of Forest, , Bihar.

3.6.12.7 Aquatic Fauna of Buffer zone (Zooplankton/Macro-invertebrates/Fishes/Amphibians /Turtles etc.)

Aquatic fauna is referred to as any form of an animal that has adapted to living in the aquatic environments such as rivers, lakes, ponds, dams, streams, etc.). Mahananda, Budhikankai & Dahuk River and its adjoining streams are formed the drainage in the study area. Few other seasonal water bodies like village ponds, streams, and nallas are also present in the study area. In general, faunal account of any water bodies can be divided into following categories, *i.e.*,

(i) zooplankton,

(ii) Macro-invertebrates/Insects/Benthos

(iii) Fishes

(iv) Amphibians/ Reptiles/ etc.

Details of Zooplankton; Macro-invertebrates/insects/benthos; Amphibians/Reptiles and Fishes recorded from the different water bodies of the study area (Kishanganj district) are given in Tables 3.28 to 3.31.

i. Zooplankton

Zooplankton is commonly found in all types of aquatic habitats. These are recognized as secondary producers and considered as one of the best tools for the environmental monitoring program. During the present study period, a total of 49 zooplankton species was recorded and identified comprising of class Protozoa (8 species), Rotifera (20 species), Cladocera (10 species), Copepoda (8 species), and Ostracoda (3 species). The details of the zooplankton diversity of different habitats are given in Table 3.28 and Fig 3.12.

Table 3.28: Zooplankton species found in the different water bodies situated in the buffer zone

S.No.	Name of the Taxa	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	Schedule Status in	IUCN Status

										WPA (1972)	
	Protozoa										
1	*Arcella* sp.	+	+	+		+	+		+	NA	NA
2	*Arcella discoides*	+	+	+	+	+	+	+	+	NA	NA
3	*Arcella vulgaris*	+	+	+	+	+	+	+	+	NA	NA
4	*Centropyxis* sp.	+	+	+	+	+	+	+		NA	NA
5	*Centropyxis ecornis*		+			+	+		+	NA	NA
6	*Euglypha* sp.	+		+	+	+	+	+	+	NA	NA
7	*Metopus* sp.		+	+	+		+			NA	NA
8	*Opercularia* sp.	+	+	+		+			+	NA	NA
	Total	**8**	**9**	**8**	**7**	**8**	**9**	**5**	**8**		
	Rotifera										
1	*Anuraeopsis*sp.	+		+	+	+	+	+	+	NA	NA
2	*Anuraeopsis fissa*				+	+	+	+	+	NA	NA
3	*Asplanchna* sp.	+	+	+		+	+	+	+	NA	NA
4	*Asplanchna brightwelli*		+		+	+	+	+	+	NA	NA
5	*Brachionus* sp.	+		+	+	+	+	+		NA	NA
6	*Brachionus angularis*		+						+	NA	NA
7	*Brachionus calyciflorus*	+	+	+	+		+	+	+	NA	NA
8	*Brachionus quadridentata*		+	+	+		+	+		NA	NA
9	*Brachionus falcatus*	+			+	+	+	+		NA	NA
10	*Brachionus forficula*	+		+		+	+		+	NA	NA
11	*Cephlodella gibba*	+	+		+	+	+	+		NA	NA
12	*Filinia* sp.	+					+	+	+	NA	NA
13	*Filinia longiseta*		+	+		+		+	+	NA	NA
14	*Keratella* sp.	+		+		+			+	NA	NA
15	*Keratella Cochlearis*	+	+	+	+	+	+	+	+	NA	NA
16	*Monostyla quadridentatus*		+	+						NA	NA
17	*Mytilina* sp.	+			+	+	+	+	+	NA	NA
18	*Polyarthra vulgaris*	+		+		+			+	NA	NA
19	*Testudinella patina*		+		+		+	+		NA	NA
20	*Trichocerca* sp.	+		+		+	+		+	NA	NA

	Total	**15**	**11**	**13**	**13**	**15**	**18**	**16**	**16**		
	Cladocera										
1	*Alona* sp.	+	+	+	+	+	+	+	+	NA	NA
2	*Alona intermediate*		+		+		+	+		NA	NA
3	*Bosmina* sp.	+		+	+	+	+	+	+	NA	NA
4	*Bosmina longirostris*	+		+			+	+		NA	NA
5	*Ceriodaphnia* sp.		+	+		+	+		+	NA	NA
6	*Chydorus sphaericus*	+	+		+		+	+		NA	NA
7	*Daphnia* sp.	+		+	+		+	+		NA	NA
8	*Leydgia* sp.		+	+		+	+		+	NA	NA
9	*Moina daphnia*	+			+		+	+	+	NA	NA
10	*Simocephalus* sp.	+	+	+		+			+	NA	NA
	Total	**9**	**7**	**8**	**7**	**6**	**11**	**8**	**7**		
	Copepoda										
1	*Cyclops* sp.	+	+	+	+	+	+	+	+	NA	NA
2	*Diaptomus* sp.	+	+	+	+	+	+		+	NA	NA
3	*Eucyclops* sp.	+	+	+			+	+	+	NA	NA
4	*Heleodiaptomus viduus*	+	+			+	+			NA	NA
5	*Mesocyclops* sp.	+	+		+		+	+	+	NA	NA
6	*Nauplius larvae*	+	+	+	+	+	+	+	+	NA	NA
7	*Neodiaptomus* sp.		+		+		+		+	NA	NA
8	*Nitzii amphibia*	+	+	+	+	+	+	+		NA	NA
	Total	**10**	**10**	**8**	**9**	**7**	**11**	**7**	**9**		
	Ostracoda										
1	*Cyprinotus* sp.	+		+	+	+	+	+	+	NA	NA
2	*Cypris sp.*	+	+	+	+		+	+	+	NA	NA
3	*Stenocypris malcolmsoni*	+	+	+	+	+	+		+	NA	NA
	Total	**4**	**3**	**4**	**4**	**3**	**4**	3	**4**		

Source: Primary Survey data of P&M Solution, Noida.

ii. Macro-invertebrates (Insects/Benthos)

Macro-invertebrates are commonly found in all types of aquatic habitats such as streams, rivers, wetlands, lakes, and ponds. The term macro-invertebrate is used for those animals that

have no backbone and can be seen with the naked eye. These animals generally include insects, crustaceans, mollusks, and annelids. They are significant within the food chain as larger animals such as fish and birds rely on them as a food source. None of the macro-invertebrate species have been observed under the of Rare, Endangered, and threatened category. Various macro-invertebrate species were collected and identified from the present study area and listed in Table 3.29.

Table 3.29: Macro-invertebrates recorded from the Core and Buffer zone

	Insecta										
1	*Baetis nymph*		+	+	+	+	+	+	+	NA	NE
2	*Caenid mayfly*	+			+		+			NA	NE
3	*Chironomus plumosus*	+	+	+	+	+	+	+	+	NA	NE
4	*Chironomus* sp.	+	+	+	+	+	+	+	+	NA	NE
5	*Damsel flies nymphs*	+			+		+			NA	NE
6	*Hirudineria sp.*	+	+	+			+	+	+	NA	NE
7	*Limnodrillus hoffmeisteri*	+					+			NA	NE
8	*Mayflies nymphs*		+		+		+	+	+	NA	NE
9	*Mosquitos larvae*	+	+	+	+	+	+	+	+	NA	NE
10	*Ranatra elongata*	+	+			+	+	+	+	NA	NE
	Total	**12**	**10**	**10**	**11**	**9**	**16**	**11**	**11**		
	Mollusca										
1	*Bellamya bengalensis*	+		+	+	+	+	+	+	NA	NE
2	*Corbicula fluminalis*		+	+	+	+	+	+	+	NA	NE
3	*Corbicula sp.*	+	+	+	+	+	+			NA	NE
4	*Gyraulus convexiculus*	+		+			+	+	+	NA	NE
5	*Gyraulus sp.*	+	+		+	+	+		+	NA	NE
6	*Lymnaea acuminata*	+		+		+		+	+	NA	NE
7	*Lymnaea sp.*	+	+	+	+	+	+	+		NA	NE
8	*Melanoides lineatus*		+	+			+		+	NA	NE
9	*Pila globosa(apple snail)*		+		+		+		+	NA	NE
10	*Unio tigridis*			+	+		+	+	+	NA	NE
	Total	**9**	**8**	**12**	**10**	**8**	**13**	**9**	**11**		
	Source: Primary Survey data of P&M Solution, Noida.										

iii. Amphibians

Amphibians and reptiles are commonly found at places along the margin of aquatic and terrestrial systems. The presence of water bodies like rivers, streams, etc. in the study area are providing shelter to many amphibian species. Some of the commonly reported amphibian species in the present study areas are given in Table 3.30.None of the Amphibians and Reptiles have been observed under the Rare, Endangered, and threatened category. Also, none of them are under the Schedule-I category as per Wildlife Protection Act, 1972.

Table 3.30: Amphibians and Reptilesrecorded from the Core and Buffer zone

S. No	English Name	Scientific Name	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	Schedule Status (WPA,1972)	IUCN Status
1	*Bufo melanostictus*	Common toad	+	+	+	+	+	+	+	+	IV	LC
2	*Bungarus caeruleus*	Common Krait	+	+	+	+	+	+	+	+	IV	LC
3	*Bungarus fasciatus*	Banded Krait	+	+	+	+	+	+	+	+	IV	LC
4	*Euphlyctis cyanophlyctis*	Indian skipper frog	+	+	+	+	+	+	+	+	IV	LC
5	*Hoplobatrachus tigerinus*	(Indian bullfrog).	+	+	+	+	+	+	+	+	IV	LC
6	*Chamelion calcarata*	Chameleon	+	+	+	+	+	+	+	+	II	LC
7	*Naja naja*	Indian Cobra	+	+	+	+	+	+	+	+	II	LC

Note:DD=Data Deficient, **LC**=Least Concern, **NE=**Not Evaluated.

Source: Primary Survey data of P&M Solution, Noida and Data supported by data of Department of Forest, Kishanganj District, Bihar.

(iii) Fishes

The study area of the present Project development project has several lentic and lotic water bodies in which few are perennial and most of the water bodies are seasonal or monsoon fed. Jammuaririver is a major lotic system in the study area. Some private ponds are also present in the study area which are mainly used for the culture of fishes. All these water bodies support fish species. Fishes found in the study area are listed in Table 3.31 and their site wise species variation is shown in Fig. 3.14.

Table 3.31: Fish Fauna found in different seasonal and perennial water bodies in the study area

S.No.	Name of the Taxa	Family Name	**S-1**	**S-2**	**S-3**	**S-4**	**S-5**	**S-6**	**S-7**	**S-8**	IUCN Status	**Schedule Status in WPA (1972)**
1	*Catla catla*	Cyprinidae	+	+	+	+		+		+	VU	NA
2	*Channa stiatus*	Chandadae					+	+	+		LC	NA
3	*Channa punctatus*	Chandadae			+	+	+		+	+	LC	NA
4	*Labeo bata*	Cyprinidae		+		+				+	LC	NA
5	*Labeo rohita*	Cyprinidae	+		+	+		+			LC	NA
6	*Macrobrachium malcomsoni*	Palaemonidae	+		+	+	+	+	+	+	LC	NA
7	*Mystus bleekri*	Bagridae		+			+	+			LC	NA
8	*Mystus tengara*	Bagridae	+	+	+	+	+	+	+	+	LC	NA
9	*Puntius sarana*	Cyprinidae			+			+	+	+	LC	NA
10	*Puntius sophore*	Cyprinidae	+	+	+		+			+	LC	NA
11	*Puntius stigma*	Cyprinidae			+	+		+			LC	NA
12	*Puntius ticto*	Cyprinidae		+	+	+			+	+	LC	NA
		Total	7	7	10	9	7	10	6	9		

Note: VU= Vulnerable, LC= Least Concern and NA= Not Application.

Source: Primary Survey data of P&M Solution, Noida and data supported by Department of Fisheries, Kishanganj District, Bihar.

3.6.13 Observations of Present Study (Flora & Fauna)

3.6.13.1 Flora

Most of the parts of the present study area (Kishanganj district) are agricultural fields, villageland. The forest of the district comprises tropical deciduous vegetation due to high temperature and humidity. No any rare, endangered and threatened floral species have been observed from the core and buffer zone of the present study.

3.6.13.2Fauna

There are no National parks, Sanctuaries, Biosphere Reserves, Wildlife corridors, Tiger/Elephant reserves (existing as well as proposed), within 1 km buffer area as well as 5 km of the project area.No any endangered and threatened faunal species were observed from the core and buffer zone of the present study area. On the other hand, there is no any

Schedule-I fauna was recorded as per the Wildlife (Protection) Act, 1972. However, care will be taken during the developmental activities if found any.

3.7Socio-Economic Environment

Demography

Demography is one of the important indicators of environmental health of an area. It includes population, sex ratio, number of households, literacy, population density, etc. In order to assess the Demographic & Socio-economic features of the district, Census data 2011, for Kishanganjdistrict inBiharstate was compiled and placed in the form of tabulation and graphical representation.

Demography of the KishanganjDistrict

As per the census records 2011, the district of Kishanganj, with a population of 16, 90,400 persons followed by 8, 66,970 males (51.3%) and 8, 23,430 (48.7%) females respectively. The decadal variation of the district has been seen at 30.4% during the decade of 2001-11. The Rural area of the district has attained a higher decadal variation of 31.0% as compared to that of urban area at 24.9%.

As per the census records 2011,the sex ratio of the district is observed as 950 females per 1,000 males. The same for rural and urban areas of the district stands at 952 and 926 respectively. It is observed from the census records that sex ratio of population in the age group 0-6, which works out to 971, is much higher than the sex ratio of the total population (950) in the district of Kishanganj while the sex ratio of (0-6) population in the rural areas of the district is 972, the sex ratio of (0-6) population for the urban areas is only 967 females per 1000 males.

It is observed that the proportion of scheduled castes and scheduled tribe's population to the total population of the district is found to be only 6.7& 3.8% respectively. For rural areas, the respective proportion of scheduled castes and scheduled tribes to the total population of the district comes out to be 6.3&4.0% respectively. Similarly,in urban areas, the percentage of scheduled castes and scheduled tribe's population to the total population of the district comes out to 10.8& 2.0% respectively.

As per the census records 2011, It is observed that the district has registered a literacy rate of 55.6%. As regards to rural and urban areas of the district the literacy rates have been registered 53.7& 71.2% respectively. The gap in the male-female literacy rates has been

16.9% point as it is63.7% male and 46.8% female respectively. For the district as a whole, the literacyrate of males is much higher than that of females.

As per the census records 2011, the work participation rate (WPR) at C.D Block level in Kishanganj district is 22.4% as main workers and 9.0% as marginal workers. Proportion of non workers in the district is 68.8%. Among the main worker's male participation rate in the district is 38.1% while that of females is 6.0%.

Religions

The population of the Kishanganj district during 2011 was 1,690,400. Hindus constitute 31.4% of the population in the district followed by Muslims 68.0%. All other four major religious communities have almost negligible percentages.

Mother Tongue

As per the census records, for KishanganjDistrict, the main mother tongue of the district was returned, Urdu, the main mother tongue of the district was returned by 47.4% of the population. The corresponding percentage for the Hindi, the second most prominent language spoken in Kishanganj district, was 43.3% Speakers of other Schedule languages were very thin in number than the two described above.

Methodology

In order to assess the Demographic & Socio-economic features along with the 10km distance based on field surveys and public consultations undertaken during the baseline field study period and Census records 2011, for Kishanganj district of Bihar State was compiled and placed in the form of tabulation and graphical representation. Entire study area is observed predominantly rural.

Purpose of the Study

Socio-economic study was conducted to establish the baseline demographic features and impacts due to this 'SandGhatProject', as operation phase of any project invariably leads to Socio-economic changes. The construction phase of any kind of project could lead to unplanned and haphazard development of slums of various size and description with little or rudimentary.Male-Female wise population distributionis given as follows in**Table 3.32 &3.33**

Table:3.32 Population Distribution of the District

Name of the District		No of Households	Total Population			Child Population (0-6 Years)		
			Persons	Male	Female	Persons	Male	Female
Kishanganj	TOTAL	338445	1690400	866970	823430	346904	175962	170942
	RURAL	306497	1529277	783318	745959	320066	162319	157747
	URBAN	31948	161123	83652	77471	26838	13643	13195
Source-Census of India, 2011								

Table: 3.33 SC & STPopulation Distribution of the District

Name of the District		Total Population	Scheduled Castes			Scheduled Tribes		
			Persons	Males	Females	Persons	Males	Females
Kishanganj	TOTAL	1690400	113118	57964	55154	64224	32506	31718
	RURAL	1529277	95770	49079	46691	60968	30877	30091
	URBAN	161123	17348	8885	8463	3256	1629	1627
Source-Census of India, 2011								

Sex Ratio

The 'Sex Ratio' of the study area is a numeric relationship between females and males of an area and bears paramount importance in the present day scenario where the un-ethnic pre-determination of sex and killing of female foetus during pregnancy is practiced by unscrupulous medical practitioners against the rule of the law of the country. It is evident that by contrast the practice of female foeticide is not prevalent in the study area.

The 'Sex Ratio' was observed as 950females per 1000 males in the District. The child (0-6 yr age) sex ratio of the district was observed as 971 female children per 1000 male children.

The village wise male-female population distribution for the study area is depicted and shown by graphical representation in**Table 3.34& Figure 3.7**

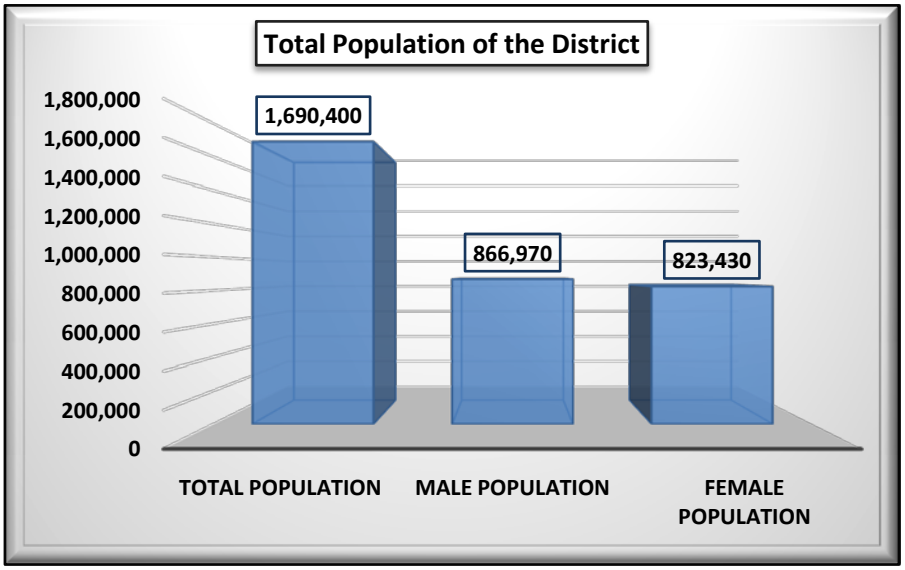


Figure 3.8 :Male-Female Wise Population Distribution

Scheduled Caste & Scheduled Tribe Population

On the basis of the SC & ST population distribution of thedistrict during 2011, the 'Scheduled Castes'population was observed as 113118persons consisting of 57964 males and 55154females respectively in the district which accounts as 6.7% to the total population (1690400persons) of the district. Scheduled Tribes ('ST') population was observed as 64224persons,accounts as 3.8% to the total population of the district consisting of 32506males and 31718females in the district.It implies that the rest 89.5% of the total population belongs to the general category.

Male-female wise distribution of *'SC' & 'ST'*population in the study area is graphically shown in**Figure 3.9 & 3.10** as follows.

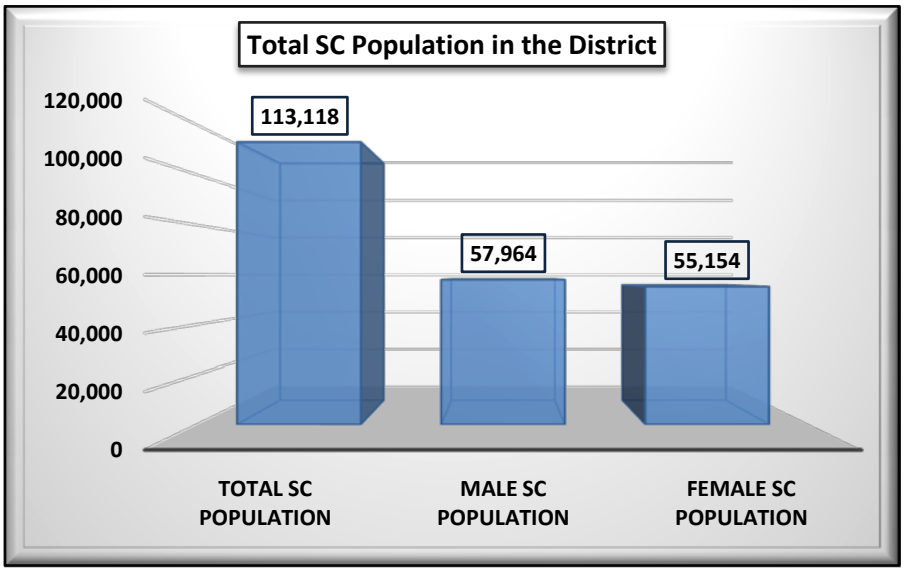


Figure 3.9 :Scheduled Caste Population in the Study Area

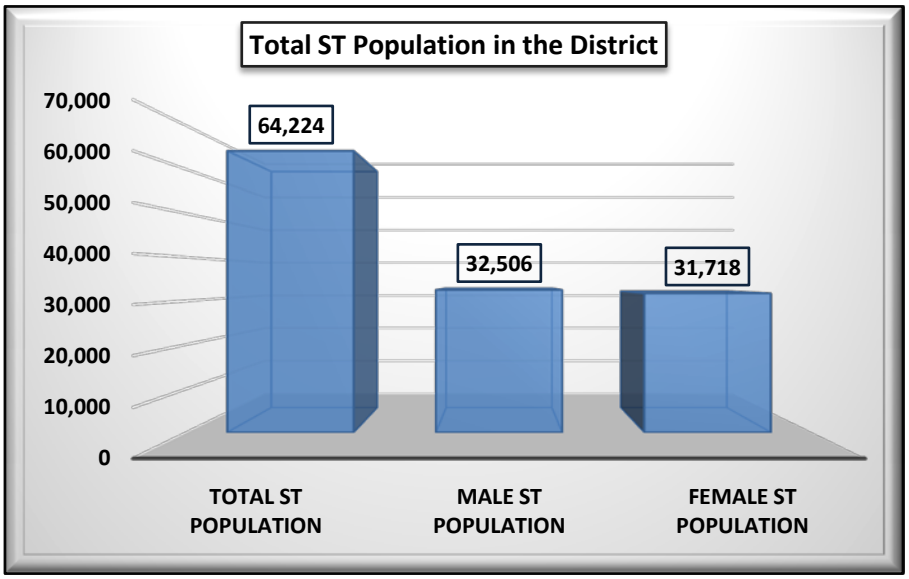


Figure 3.10:Scheduled Tribes Population in the Study Area

Literacy Rate

Literacy level is quantifiable indicator to assess the development status of an area or region. Male-Female wise literates and illiterate's population is represented in**Table3.34** Total literate's population was recorded as745056 persons (44.0%) in the study area.**Table 3.34** reveals that Male-Female wise literates are observed as 439921&305135 persons respectively, implies that the 'Literacy Rate' is recorded as 44.0% with male-female wise percentages being 26.0% &18.0% respectively.

The Male-Female wise graphical representation of literates &illiterate's population in study area villages/town is shown in**Figure 3.11**

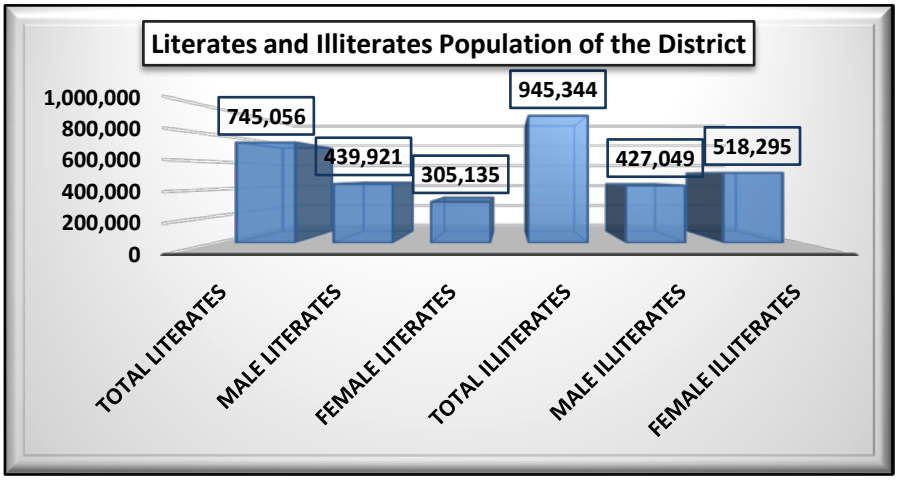


Figure3.11 : Literates & Illiterates Persons in the District

Table 3.34 : Literates and Illiterates Persons in the District

Name of the District		Total Population	Literates			Illiterates		
			Persons	Males	Females	Persons	Males	Females
Kishanganj	TOTAL	1690400	745056	439921	305135	945344	427049	518295
	RURAL	1529277	649466	386310	263156	879811	397008	482803
	URBAN	161123	95590	53611	41979	65533	30041	35492
Source-Census of India, 2011								

Economic Profile ofKishanganjDistrict:

The economy of the district is solely based on agriculture. Some of its chief agricultural products are paddy, wheat, maize, Jute, etc. Almost all people of the district are engaged in agriculture since it is scantily industrialized. Only a few industries and factories of jute, plywood, silk, poultry farming, tea processing, etc are found in it which also helps in its economy to some extent.

In 2006 the Ministry of Panchayati Raj declared Kishanganj district as one of the economically distressed district in Bihar and currently receiving funds from the Backward Regions Grant Fund Programme (BRGF).Kishanganj is the only tea producing district in Bihar.

Workers Scenario:

Occupational studied to assess the skills of people in the district. Occupational pattern helps in identifying major economic activities of the region. In the district, the Main and Marginal Workers population was observed as 384416(23.0%) and 144648(8.0%) to the total population (1690400), while the remaining 1161336(69.0%) persons were recorded as non-workers. Thus it implies that the semi-skilled and non-skilled work-force required for the project is available in aplenty.

The village-wise main and marginal worker's population with further classification as casual, agricultural, households and other workers is shown as follows in**Table 3.35**

Table 3.35 : Occupational Pattern of the District

Name of the District		MAIN WORK_P	MAIN_CL _P	MAIN_AL_ P	MAIN_HH_ P	MAIN_OT_ P	MARG WORK_P	MARG_CL _P	MARG_AL _P	MARG_HH_ P	MARG_OT_ P
Kishanganj	TOTAL	384416	90347	220301	5832	67936	144648	17515	101566	5801	19766
	RURAL	342315	87453	212968	4574	37320	135595	17213	98550	5305	14527
	URBAN	42101	2894	7333	1258	30616	9053	302	3016	496	5239

Source-Census of India, 2011

ABBREVIATIONS:

MAIN WORKERS POPULATION:MAIN WORK_P: Main worker's total population, **MAIN_CL_P:** Main cultivated labour population, **MAIN_AL_P:** Main agricultural labour population, **MAIN_HH_P:** Main worker's population involved in household industries, **MAIN_OT_P:** Main other worker's population

MARGINAL WORKERS POPULATION:

MARG WORK_P: Marginal worker's total population, **MARG_CL_P:** Marginal cultivated labors total population, **MARG_AL_P:** Marginal agricultural labors population, **MARG_HH_P:** Marginal workers involved in household industries, **MARG_OT_P :** Marginal other workers Population

Distribution of work participation rate of the study area population is shown in**Table 3.36** as follows;

Table 3.36 : Work Participation Rateof the District

Occupation Class	Year, 2011
Main Workers	**384416(23.0%)**
Male	334500(87.0%)
Female	49916(13.0%)
Marginal Workers	**144648(8.0%)**
Male	86692 (60.0%)
Female	57956(40.0%)
Non-Workers	**1161336(69.0%)**
Male	445778(38.4%)
Female	715558(61.6%)
Total Population (10km)	**1690400**
Source: Census of India Records, 2011	

Graphical representation of Workers Scenario is given below as**Figure 3.12**

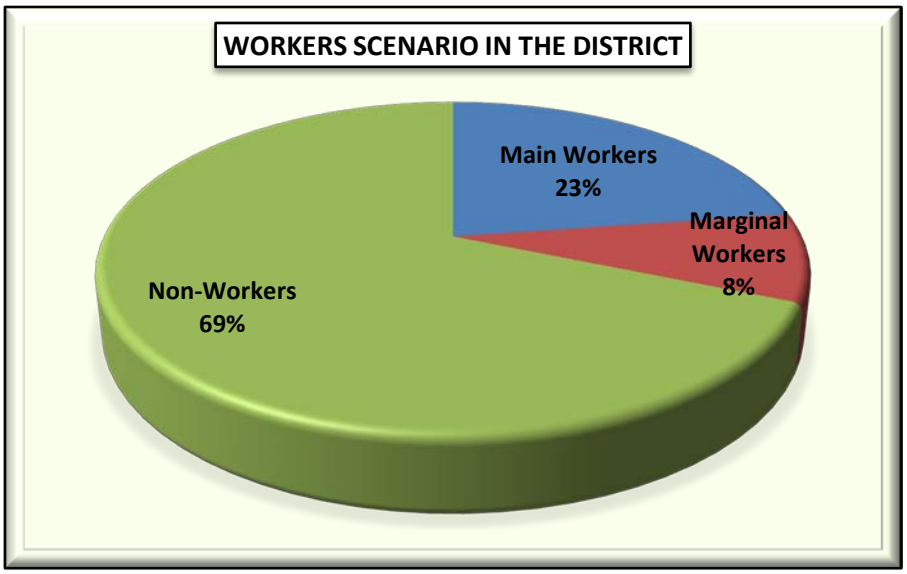


Figure 3.12 :Workers Scenario of the District

Composition of Main Workers:

The 'Main Workers' were observed as 384416persons (23.0%) to the total population (1690400) of the district and its composition is made-up of Casual laborers as 90347 (23.0%), Agricultural laborers as 220301(57.0%), Household workers 5832(2.0%) and other workers as 67936(18.0%) respectively.

. Composition of Main workers is shown below as**Figure 3.13**

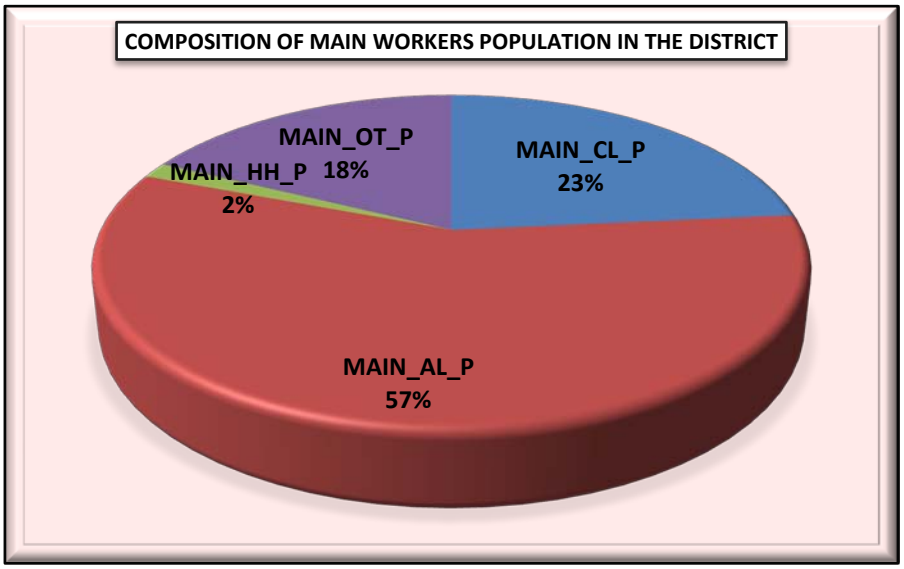


Figure 3.13 :Composition of Main Workers Population

Composition of Marginal Workers:

The total marginal workers are observed as 144648 which constitute 8.0% to the total population (1690400) comprising of Marginal Casual Laborers as 17515 (12.0%), Marginal Agricultural Laborers as 101566(70.0%), Marginal Household laborers as 5801 (4.0%) and marginal other workers were also observed as 19766 (14.0%) of the total marginal workers respectively.

Details about marginal workers in the study area are tabulated inTableComposition of Marginal workers is shown in**Figure 3.14** as follows.

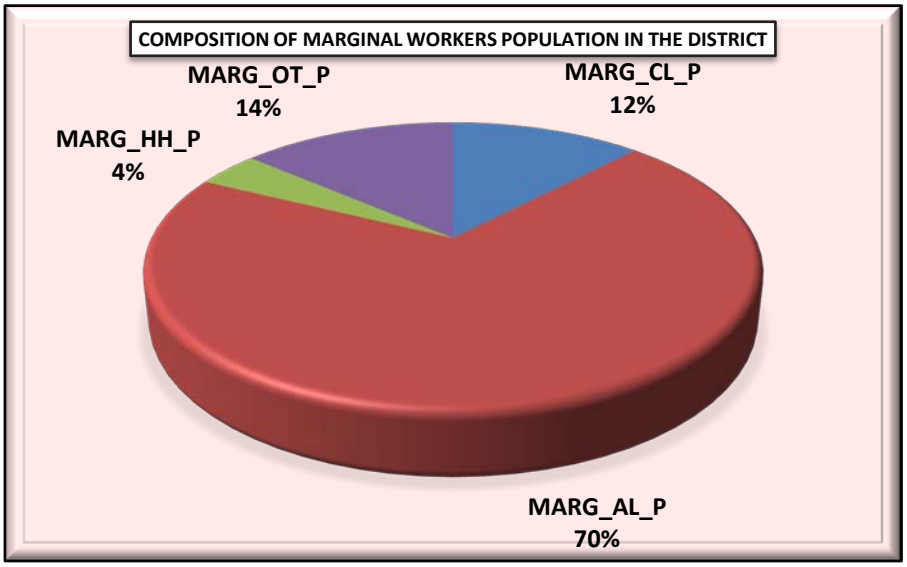


Figure 3.14 :Composition of Marginal Workers

Composition of Non-Workers:

The total Non-worker's population was observed as 1161336persons which accounts69.0% to the total population (1690400) of the study area. Male-female wise Non-worker's population was recorded as 445778 Males (38.4%) and 715558Females (61.6%) respectively.

Details about Total Non-workers in the district are compiled in**Table 3.38** Graphical representation of Non-worker's population is shown as follows in**Figure 3.15**

Table 3.38 :Composition of Non-Workers

Non-Workers Population		
Persons	**Males**	**Females**
1161336	445778 (38.4%)	715558(61.6%)

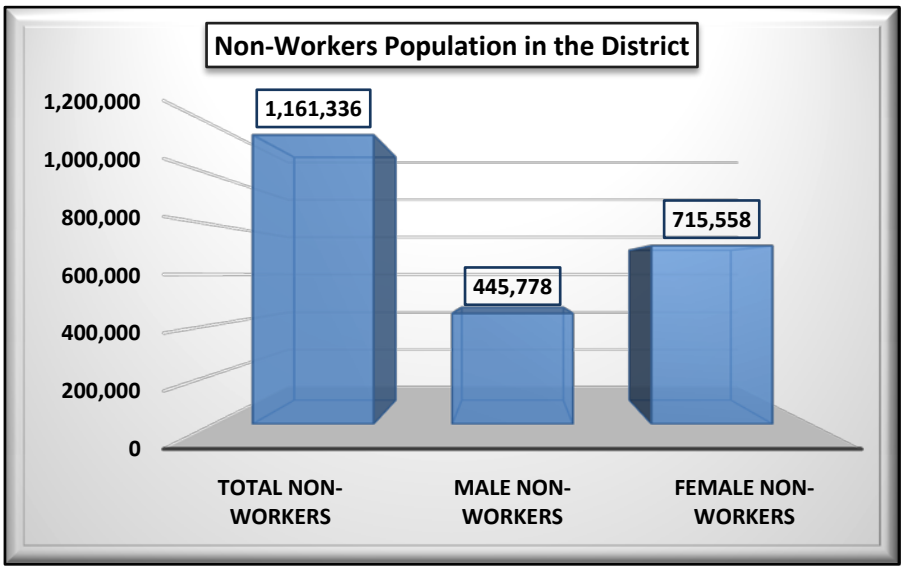


Figure 3.15: Composition of Non-Workers

Basic Infrastructure Facilities Availability*(as per the census records of 2011)*

A review of basic infrastructure facilities (Amenities) available in the study area has been done on the basis of the field survey and Census records, 2011 for the district inhabited villages of Kishanganj District in Biharstate.The districtvillages haveaverage level of basic infrastructure facilities like educational, medical, potable water and power supply and transport& communication network.

Educational Facilities

The educational facilities have been further strengthening now and a number of private public schools and colleges are also functioning in the surroundings of the study area. Besides, there are Engineering and Medical colleges available in Towns and District headquarters only. Higher education facilities are available in Towns of the district. There is a considerable improvement in educational facility. The villages of the study area have no such facilities can reach within 5to 10km range.

There are as many as 643 villages accounting for 87.84 percent ofthe total number of inhabited villages (732) in the district where educational facility is available.Among the C.D. Blocks, Bahadurganj has the largest proportion of villages with 96.1% education facility where as smallest proportion of villages with educational facility is observed inThakurganj C.D. Block with 76.5%.

Availability of University Education in Kishanganj District

There are several affiliated and constituted colleges of the B.N. Mandal University, Madhepura which imparts under graduate and post graduate education in the district. IGNOU (Indira Gandhi National Open University) has opened special study center in Marwari College, Kishanganj of the district where one can study many distance courses of under graduate, post graduate and vocational etc.

Medical Facilities

The medical facilities are provided by different agencies like Govt. & Private individuals and voluntary organizations in the district. Overall villages in the district are served by moderate level of medical facilities. Specialized medical facilities are available only in towns and District Headquarter (HQ) only.

The availability of medical amenity in the villages is quite low and only40.3% villages have got it. Among the C.D. Blocks, Kishanganj has the largest proportion ofvillages with 76.5% medical facility, it is followed by Terhagachh and Pothia C.D. Blockswith 61.5 and 56.7% respectively. On the other hand, Thakurganj has the minimumproportion of villages (6.72%) where medical amenity is available.

Potable Water Facilities

Potable water facility is available in most of the villages of the study area. The entire study area has average level of potable water facilities. Hand Pump(HP) water facility is commonly observed in the study area as potable water facility.

There are as many as 732 villages accounting for 100 percent of the totalinhabited villages in the district where improved drinking water facility is available

Communication, Road & Transport Facilities

Apart from Post &Telegraph Office (PTO) services, transport is the main communication linkage in the district study area. As per the Census records 2011, data shows that the area has good postal facilities in the district.

Postal facility is available in 117 villages (16.0%) out of 732 inhabitedvillages in the district. Pothia C.D. Block has the maximum proportion of villages having postalfacility (24.1%) followed by Thakurganj C.D. Block with 17.7%. Kishanganj C.D. Blockhas the minimum proportion of villages having postal facility (8.8%).

Connectivity - Sand Mining Project, Kishanganj Unit Sand Ghat is well connected to the nearest metalled roads/Highways. The approach road will be maintained and dust suppression will be done regularly.

Communications ***(****Kishanganj District****)***

Transport communication facilities are available only in 144villages (19.7%) out of 732 inhabited villages in the district. Kochadhamin C.D. Block has themaximum proportion of villages with 38.5% which are connected by bus or rail or navigableriver/canal services, etc, followed by Thakurganj C.D. Block with 22.7% while TerhagachhC.D. Block has the minimum proportion of villages with only 5.1%.

Roads: The district of Kishanganj is well served by a network of roads. The roads are classified as the National Highways, State Highways, Major District Roads and Other District Roads. They are maintained by the P.W.D., the Rural Engineering Organisation, the Zila Parishad and the municipalities. All the 7 Block headquarters are connected with pucca roads. The district is connected by NH-31 from Barhi (Hazaribagh, Jharkhand) and Guwahati (Assam). SH-63 also passes through the district. East –West corridor also passes through this district.

Railway: The district is served by railways. Kishanganj the district headquarters, itself is connected with both the broad and metre gauges.

Airways: The district has a landing ground at Kishanganj which is suitable only for the landing of small aeroplanes. There are no air services available at present.

Banking Facility

The study area has almost all the schedule commercial banks with ATM facility at urban areas and the district HQ. Banking facility is available only in 77 villages (10.52%) out of 732 inhabited villages in the Kishanganj district. Among the C.D. Blocks, Pothia has the maximum proportion (20.0%) of villages having banking facility and Kishanganj has the minimum proportion of villages having banking facility with 3.0%.

Agricultural Credit Societies

Agricultural credit societies are available in 154 villages(21.04%) out of 732 inhabited villages in the district. Among the C.D. Blocks, Bhadurganj has themaximum proportion of villages having Agricultural credit society facility with 29.1% whileDighalbank has minimum proportion of villages having agricultural Credit Societies facility with12.5%.

Approach by Pucca Road

This facility is available in 592 villages (80.9%) out of 732inhabited villages in the district. Among the C.D. Blocks, Bahadurganj has the maximumproportion of villages having 100% Approach by pucca road while Terhagachh has theminimum proportion of villages having pucca approach road with only 42.3% of totalinhabited villages.

Trade and Commerce

Kishanganj is essentially an agricultural district. The trade and commerce of the district have also been affected by its geophysical condition. It has close commercial relations with the border areas and with Nepal since time immemorial. In Kishanganj district trade consists mainly of export of jute, paddy, rice, maize, mustard seed, tobacco, bamboos, timbers, gunny bags and hides, and of import of cloth, salt, kerosene oil, vegetable oil, sugar, cement, lime and other manufactured goods.

Kishangnj is the important trade centre in the district – The Chief Commercial Commodity of the district is jute, the main determining factor of the centre of trade. The wholesale mandi of jute is also located at Kishanganj. Most of the internal trade is carried on in the village hats which are held on fixed days twice or thrice a week, Bhadarpur on Galgalia side is the main trade centre of Nepal with which Kishanganj district has regular and close

commercialrelations. The market or this place is virtually in the hands of the Indian merchants.

Mines and Minerals

As per the census records 2011, the geological formation of the district consists almost entirely of alluvium and there are no minerals of any importance in the district.

Power Supply

It is revealed from the census data on amenities availability as per the census record of 2011; most of the villages and towns of the district are electrified for Domestic, Agriculture, and Commercial& for allpurposes.

The district receives its entire power supply from Bihar State Electricity Board. The Government is trying to extended electric line to the maximum number of villages by implementing various schemes for rural electrification. 479 Villages of the district are electrified.

Brief Description of Places of Religious, Historical or Archaeological Importance and Tourist interest in Villages and Towns of the District:(*District level information only*)

Brief description of place of religious, historical or archaeological and tourist interest are as follows;

Andhasur-The village lies about 13 km west of the block headquarters and Kochadhamin and is noted for itsShiva temple. A large fair, lasting for a month, is held annually on the occasion of Shivaratri.

Dighalbank- The village is the headquarters of the block bearing the same name and is situated on the northernborder of the district with Nepal. It has a semal tree in the compound of the police station, believedby tradition to be the tree on which the pandava, prince Arjuna, had kept his Gandiva (bow).

JiranGachh - The village lies in Thakurganj block and is situated on the Garga-Darjeeling Road, about 9 km from Thakurganj railway station. According to tradition, the pandavas are believed to have spent apart of the period of their exile in this village. To commemorate this, an annual fair is held in themonth of Chaitra.

Tulshia- A big village, situated about 32 km north of Kishanganj town and 6 km from the blockhedquarters at Dighalbank, is an important commercial centre in the locality. It has a temple ofShiva around which a fair is held annually on the occasion of Shivaratri.

Kishanganj- The town is the headquarters of the district of Kishanganj the same name is situated on the Ganga-Darjeeling Road and is rail head. It has three jute processing factories and is an important centre for export of jute.

Bishunpur- A large village situated at the distance of 10 km from the block headquarters of Kochadhamin, is noted for its market and believed to be one of the largest in Kishanganj district.

Social and Cultural Events

No major social and cultural events has taken place in the district during the decade. However, the district has been famous for fairs and melas held at different places throughout the year. There is a brief lull during the two months of rainy season.

Rehabilitation & Resettlement (R & R)

Policy to be adopted (Central/State) in respect of the project affected persons including home or land oustees and landless labour.There is no structure or habitation in the core zone mining lease area, hence, any planning with respect to Rehabilitation & Resettlement is not applicable.

4.0 GENERAL

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

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

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

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

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

4.1 LAND ENVIRONMENT

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

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

Anticipated Impacts:

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

Mitigation measures:

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

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

4.2 WATER ENVIRONMENT

Anticipated Impacts:

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

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

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

Mitigation measures

Project activity will be carried out only in the dry part of the Dahuk, Gauriya, Mahananda, Mechi & Kankai 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 3m below ground level or above the ground water table whichever comes first. Hence mining will not affect the ground water regime as well.

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

4.3 AIR ENVIRONMENT

Impact On Air Quality

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

The mining is proposed to be carried out by opencast manual method. The air borne particulate matter (PM10) generated by ore and waste handling operations, transportation and screening of ore is the main respirable air pollutant. The emissions of Sulphur dioxide (SO2), Nitrogen Oxides (NO2) contributed by vehicles plying on haul roads will be marginal. Prediction of impacts on air environment has been carried out taking into consideration proposed production and net increase in emissions.

4.3.1 Emissions Details

Loading - unloading and transportation of sand material, wind erosion of the exposed area and movement of light vehicles will be the main polluting source in the proposed mining activities releasing Particulate Matter (PM10) affecting Ambient Air of the area. Emission during, Loading and unloading was calculated by the area sources. Details of emission during loading/unloading and transportation on the haul road, wind erosion of the exposed area and road maintenance were discussed and combined impact was predicted in the worst case scenario under worst meteorological condition given as follows:

Loading and Unloading - US EPA, 2008, revision of emission factor for AP-42 was used to calculate emission of particulate matter released into the atmosphere during loading and unloading separately. Emission during loading was found more than during unloading. Emission of PM10 during loading was calculated and found to be 1.92 x 10-3 g/s/m^2 based on moisture

content 10-20% mine. It is assumed that moisture content was 10% and further moisture content will be increased to 10-20% to reduce emission of PM10 during unloading and average wind speed was 0.92 m/s as observed with site data as shown in wind rose and discussion of local meteorology of the area.

Haul Road - US EPA, 2006, revision of emission factor for AP-42 was used to calculate emission of particulate matter released into the atmosphere during transportation of ore and over burden by trucks operated per hour on haul road. Emission of PM10 due to transportation of sand on haul road was 1.65 x 10-4 g/s/m2 based on assumption that silt content spread on road surface was 5%, and efficiency of PM10 emission control 90%. Truck will be fully covered with tarpaulin material and emission of PM10 during on the haul road will be insignificant.

Mitigation measures

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

- ✓ Water sprinkling will be done on the haul roads twice in a day.
- ✓ Deploying PUC certified vehicles to reduce their emissions
- ✓ Proper tuning of vehicles to keep the gas emissions under check
- ✓ Monitoring to ensure compliance with emission limits would be carried out during operation
- ✓ There is no major source of emissions except emission from combustion of fuels from the Transportation Vehicles and Material Handling.
- ✓ Besides this, to control the emissions further regular preventive maintenance of Equipment / Transportation Vehicles will be carried out on contractual basis.
- ✓ It will be ensured that all transportation vehicles carry a valid PUC certificate.
- ✓ Plantation will be carried out along the approach road, river banks & at all strategic places in the vicinity area.
- ✓ Periodic air quality monitoring will be done to assess the quality and for timely corrective actions.

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

4.4 NOISE ENVIRONMENT

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

Anticipated Impacts:

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

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

Table 4.1, Damage risk criteria for hearing loss OSHA regulations

Maximumallowable duration per day in hour	Sound pressure dB(A)	Remarks
(1)	(2)	(3)
8.0	90	1. For any period of exposure falling in between any figure and lower figure as indicated in column (1), the permissible sound is to be
6.0	92	
4.0	95	
3.0	97	
2.0	100	
1 ½	102	
1	105	

¾	107	determined by extrapolation or proportionate scale. 2. No exposure in excess of 115 dB (A) is permissible.
½	110	
¼	115	

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

a. Mitigation measures

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

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

4.5 BIOLOGICAL ENVIRONMENT

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

Anticipated Impacts:

Flora

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

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

Fauna

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

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.

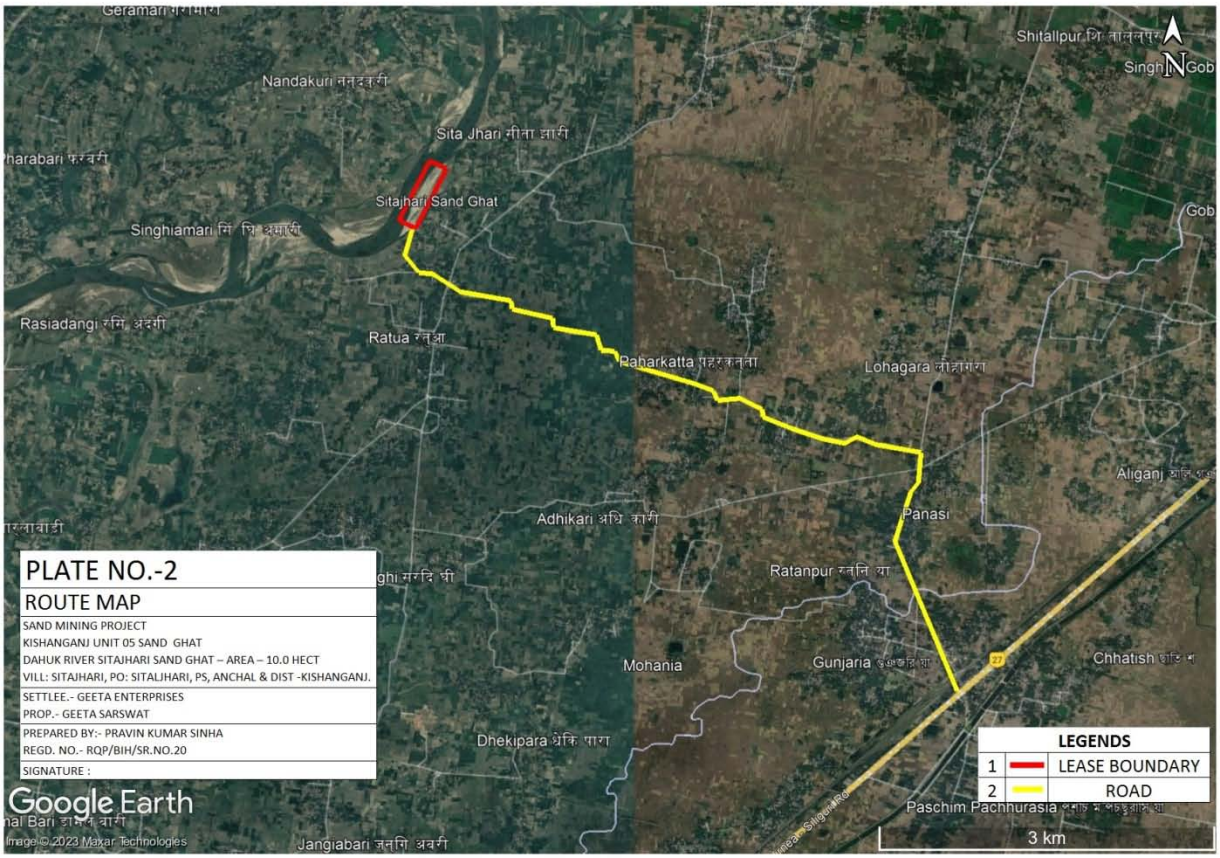
Fauna

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

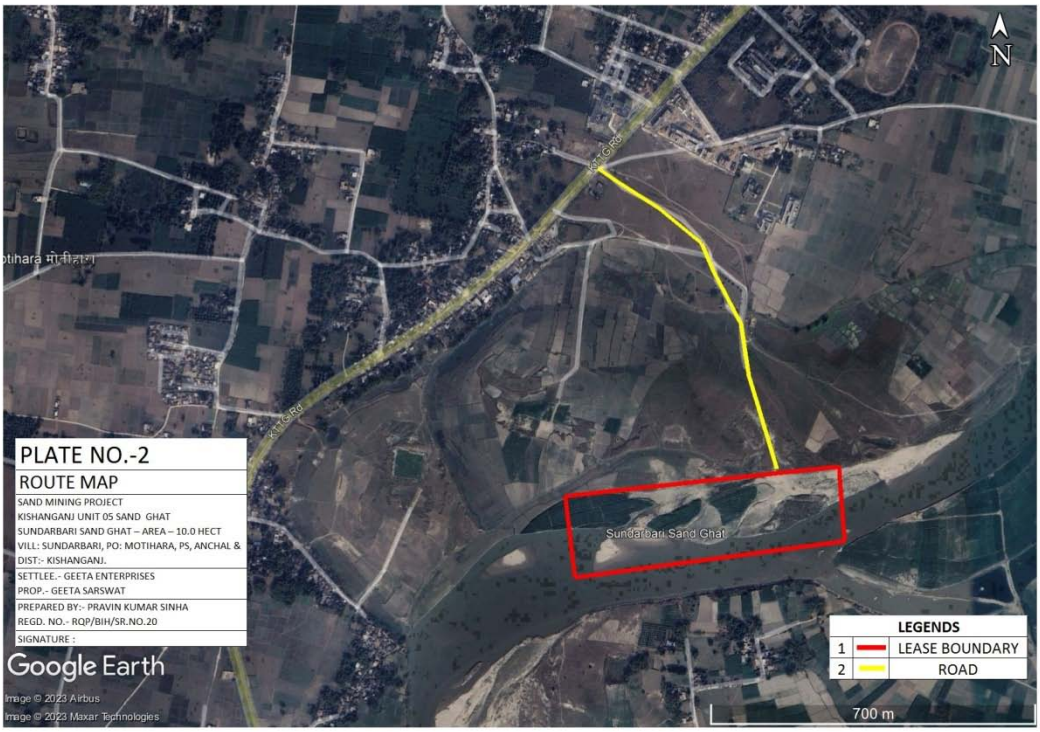
4.6 TRAFFIC ANALYSIS

Transportation Route:

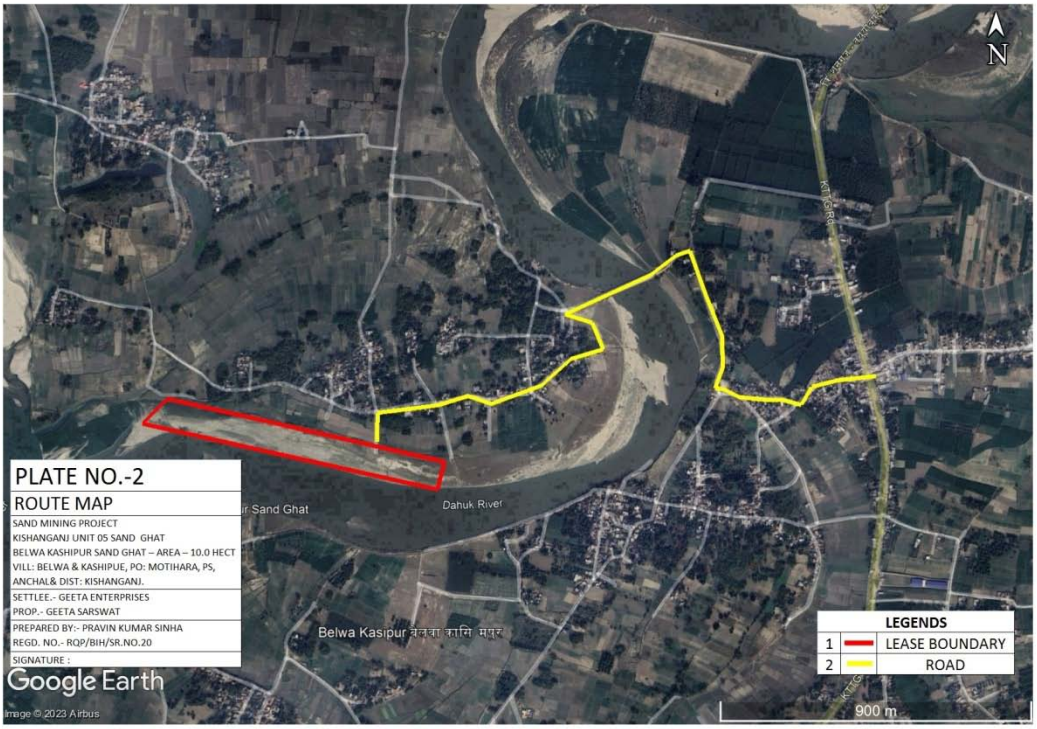
The sand extracted will store the nearby storage point. From there sand will be transported to the market. Sand will be stored in to storage point and from there it will be transported in the night time when traffic load is low on nearest SH or NH.



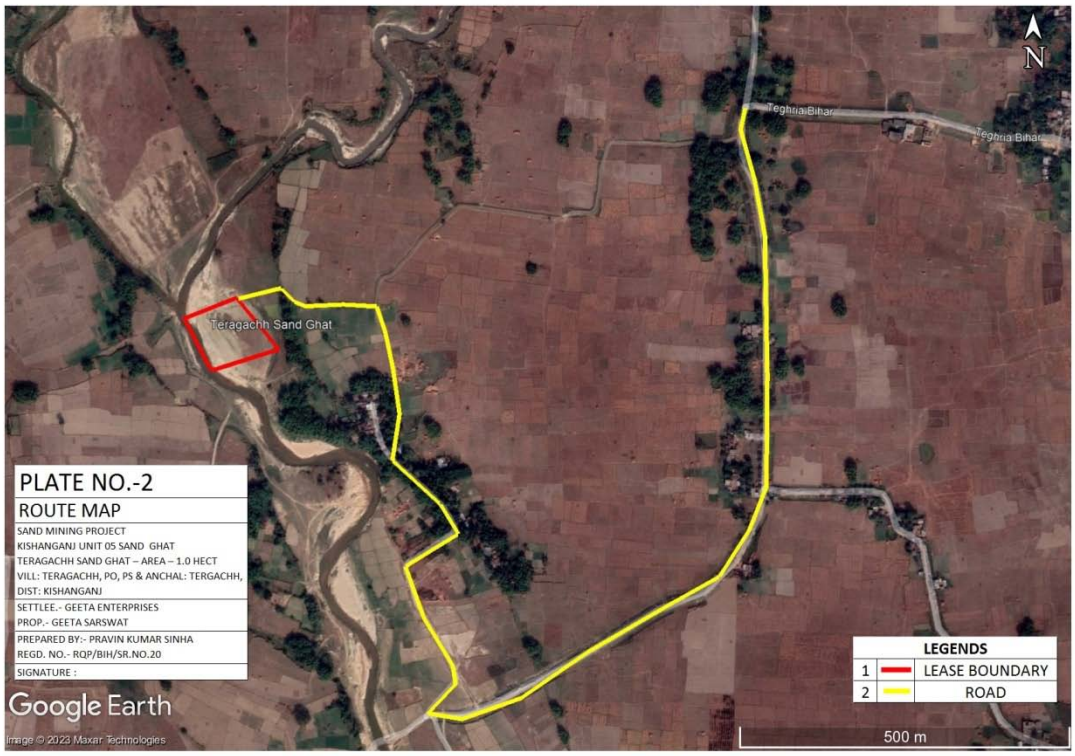
Sitaljhari Sand Ghat



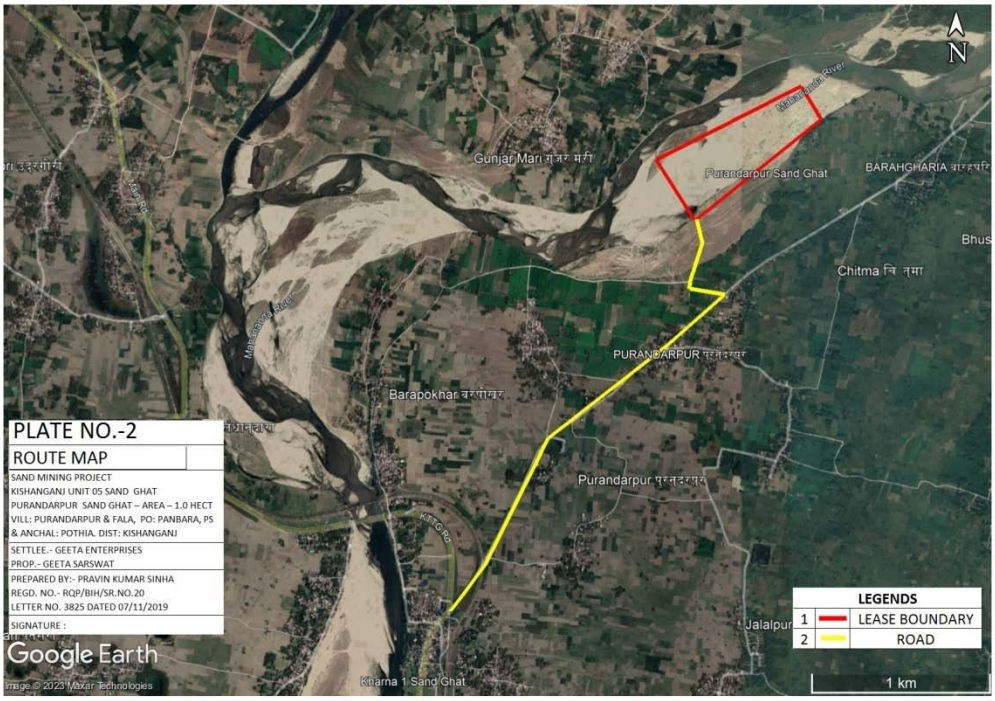
Sundarbari Sand Ghat



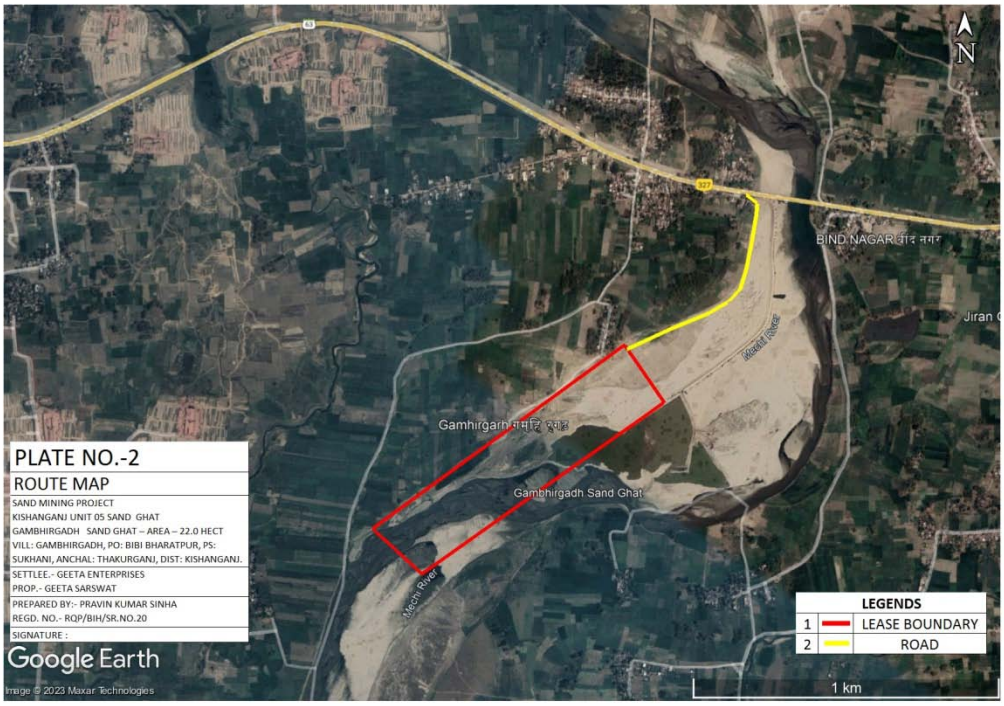
Belwa Kashipur Sand Ghat



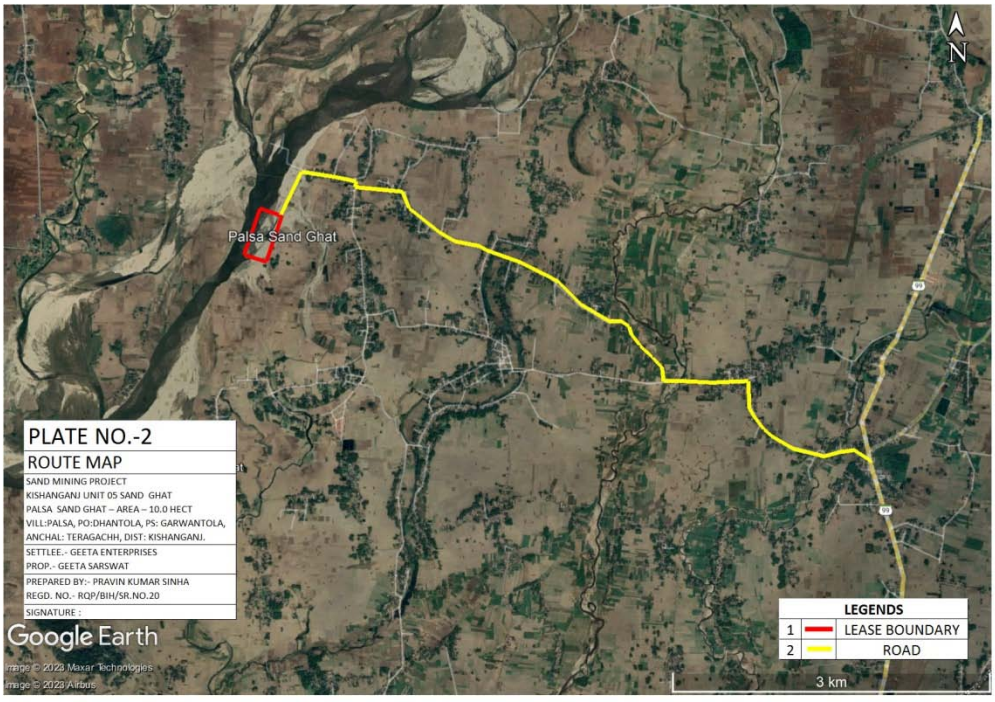
Teragachh Sand Ghat



Purandarpur Sand Ghat



Gambhirgadh Sand Ghat



Palsa Sand Ghat

FIGURE 4.2 MAP SHOWING EVACUATION ROUTE

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

Table 4.2 (i): Existing Traffic Scenario & LOS

Road	V	C	Existing V/C Ratio	LOS
National Highway (NH-327 & NH-27)	2500	15000	0.16	A

Source: Capacity as per IRC: 64-1990

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

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

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

Reference: ENVIS Technical Report, IISc, Bangalore.

During Mine operation for **Kishanganj Unit- 05 Sand Ghat**

Proposed Capacity of Mine/annum : **1387380** TPA

No. of working days : 250 days

Proposed Capacity of mine/day : 5549.52 or 5550

Truck Capacity : 16 tonnes

No. of trucks deployed/day : 347

Increase in PCU/day (347*3) : 1041

Table 4.2 (ii): Modified Traffic Scenario & LOS

Road	V	C	Modified V/C Ratio	LOS
National Highway (NH-327 & NH-27)	2500 + 1041 = 3541	15000	0.23	B

Results

From the above analysis it can be seen that the LOS has changed from 0.16 to 0.23 at Highway intersection that remains 'B' i.e ' Very Good '. Hence, there will not so much adverse affect on the proposed evacuation roads due to additional traffic. Traffic management has been proposed as given in below.

Traffic Management:

1. Roads will be repaired regularly and maintained in good conditions.
2. Haul roads will be sprinkled with water to keep the dust suppressed.
3. A supervisor will be appointed to regulate the traffic movement near the site.
4. Speed breakers will be constructed near accident prone areas to calm the traffic and its speed.

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5.0 ANALYSIS OF ALTERNATIVE TECHNOLOGY AND SITE

5.1 Site Alternatives under Consideration

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

5.2 Analysis of Alternative Technology

5.2.1 Choice of Method of Mining

Factors in the choice of an actual mining method for a given deposit are deposit characteristics, requirement of health and safety and environmental concerns, production, scheduling scope of mechanization, workforce requirements wage rates, replenishment, operating and capital cost estimates. The selection of the mining method (development and extraction) is a key decision to be made in the opening up of a mine.

Surface or open cast mining is used for large, near-surface mineral deposits. Mineral is exploited, loaded into trucks, and hauled to a market.

The opencast mining method will be adopted because of the following reasons:

- The opencast mining operations ensure higher mineral conservation.
- Replenishment

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

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6.0 INTRODUCTION

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

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

6.1 ENVIRONMENTAL MONITORING AND REPORTING PROCEDURE

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

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

The key aims of environment monitoring are:

1. To ensure that results/ conditions are as forecast during the planning stage, and where they are not, to pinpoint the cause and implement action to remedy the situation.

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

6.2 MONITORING METHODOLOGIES AND PARAMETERS

Air quality monitoring

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

Table 6.1, Monitoring methodologies and parameters

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

Water quality monitoring

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

- Surface water samples will be analyzed for all the parameters as per EPA, 1986
- Ground water samples will be analyzed for all the parameters as per IS-10500:2012.

Soil quality monitoring

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

Noise level monitoring

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

a) To compare sound levels with the values specified in noise regulations

b) To determine the need and extent of noise control of various noise generating sources

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

Socio-economic Survey

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

Plantation Monitoring Programme

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

6.3 MONITORING SCHEDULE

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

Table 6.2, Details of monitoring schedule

S.No.	Description of Parameters	Schedule of Monitoring
1	Air Quality	24 hourly samples twice/Thrice 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 MONITORING SCHEDULE - IMPLEMENTATION

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

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

a) Collection of air and water samples at strategic locations with frequency suggested and by analyzing thereof. If the parameters exceed the permissible tolerance limits, corrective regulation measure will be taken.

b) Collection of soil samples at strategic locations once every two years and analysis thereof with regard to deleterious constituents, if any.

c) Measurement of water level fluctuations in the nearby ponds dug wells and bore wells and to assess if mining has got any impact on it or not.

d) Measurement of noise levels at mine site and adjacent villages will be done twice a year for first two years and thereafter once a year.

e) Post plantation, the area will be regularly monitored in every season for evaluation of success rate. For selection of plant species local people should also be involved.

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

6.5 BUDGET ALLOCATION FOR MONITORING

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

Table 6.3, Budget for monitoring

S. No.	Description	Cost to be incurred (in lakhs/annum)
1	Water Quality (Surface & Groundwater)	1.0
2	Soil Quality	0.50
3	Air Quality	1.0
4	Noise Level	0.5
5	Plantation Monitoring	0.5
6	Socio-economic Condition	0.5
TOTAL		**4.0**

6.6 REPORTING SCHEDULES OF THE MONITORING DATA

It is proposed that voluntary reporting of environmental performance with reference to the EMP should be undertaken. The environmental monitoring cell shall co-ordinate all monitoring programmes at site to furnish the data to the State regulatory agencies regularly in respect of the stipulated prior environmental clearance terms and conditions. The proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and also the details of website where it is displayed.

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7.0 PUBLIC CONSULTATION

This is Draft EIA report public hearing is yet to be conducted.

7.1 HAZARD IDENTIFICATION AND RISK ASSESSMENT METHODOLOGY

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

Step I: Hazard Identification

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

Step II: Risk Assessment

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

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

Step III: Risk Control

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

Step IV: Implementation of risk controls

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

The most effective methods of control are:

- ✓ Elimination of hazards.
- ✓ Substitute something safer.

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

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

Step V: Monitor and Review

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

A) RISK ANALYSIS

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

a) Initial Site Evaluation,

b) Detailed Site Evaluation,

c) Priority Site Investigations and Recommendations.

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

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

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

Risk analysis is done for:

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

Table 7.1, Risk Likelihood Table for Guidance

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

A logical systematic process is usually followed during a qualitative risk assessment to identify the key risk events and to assess the consequences of the events occurring and the likelihood of their occurrence Table 7.2

Table7.2, Qualitative Risk Assessment

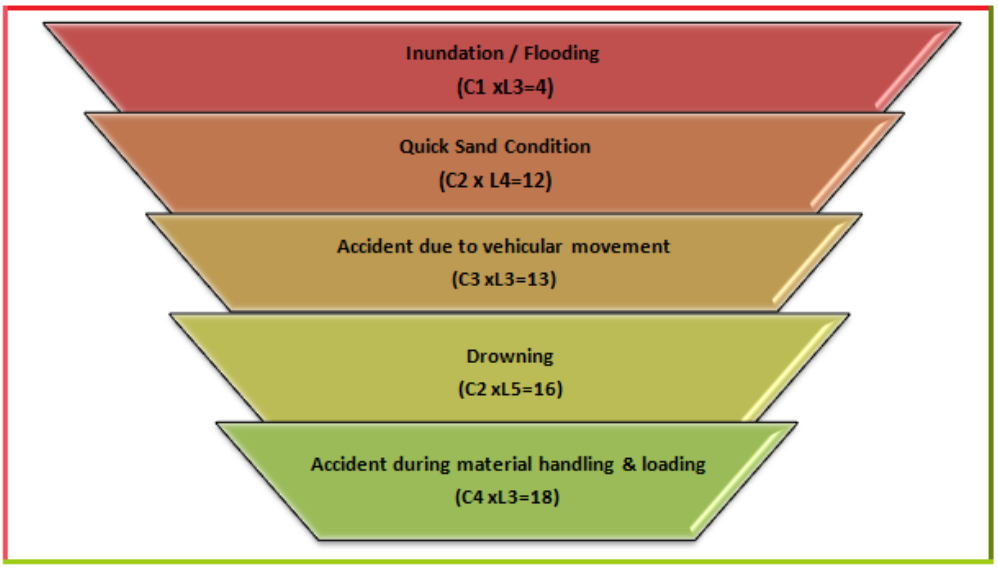
Risk Rank **Likelihood Consequence**	**L1** **Almost certain**	**L2** **Likely**	**L3** **Possible**	**L4** **Unlikely**	**L5** **Rare**
C1 **Catastrophic**	**1**	**2**	**4**	**7**	**11**

C2 Major	3	5	8	12	16
C3 Moderate	6	9	13	17	20
C4 Minor	10	14	18	21	23
C5 Insignificant	15	19	22	24	25

RISK RATING:

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

7.2 RISK ASSESSMENT



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

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

The Risk rating of such hazards is as follows:

7.2.1 INUNDATION/FLOODING

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

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

Measures to prevent consequences of inundation/flooding

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

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

7.2.2 Quick Sand Condition

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

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

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

Measures to Prevent Quick Sand Condition

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

7.2.3 ACCIDENT DUE TO VEHICULAR MOVEMENT

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

Measures to Prevent Accidents during Transportation

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

7.2.4 DROWNING

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

Measure to Prevent Drowning

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

7.2.5 ACCIDENT DURING MATERIAL HANDLING & LOADING

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

Measures to Prevent Accidents during material handling & loading

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

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

7.3 DISASTERS & ITS MANAGEMENT

7.3.1 Anticipated Disaster

1. Floods: Most of the areas of this district are flood prone owing to the presence of seasonal rivers. Rivers and its tributaries cause heavy losses to the human lives, livestock, land and property mainly due to flash floods. Hence no mining has been proposed during monsoon and flood alerts will be given, if any.

2. Earth Quake: Kishanganj District like other areas of Bihar is moderately vulnerable to earthquake as it exists in Zone V. However the vulnerability to damage near the site is quite low as there are no built in structures at the site.

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

7.3.2 Disaster Management Plan & Strategy

The Disaster Management Plan has three components:

(A) Risk Analysis and Vulnerability Assessment:

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

(B) Response Plan:

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

(C) Mitigation Strategy:

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

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

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

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

7.4 SOCIO-ECONOMIC IMPACT OF THE PROJECT & SAFETY MEASURES

INTRODUCTION

Socio-Economic Impact Assessment (SEIA) refers to systematic analysis of various social and economic characteristics of human being living in a given geographical area during a given period. The geographical area is often called Study Area or Impact Area. SEIA is carried out separately but concurrently with Environment Impact Assessment (EIA). The study area consists of core area where the project is located and a buffer area encircling the project area with a radius of 10 km from the periphery of the core area. For every new project or existing project under expansion or tied for modernization or change in product mix, Socio-economic Impact Assessment is mandatory. The Socio-economic impact assessment focuses the effect of the project on social and economic well-being of the community. The impact may be direct or indirect. Further, the impact may be positive or negative.

OBJECTIVES OF SEIA

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

SCOPE

The Scope of the study is as follows:

a) To collect baseline data of the study area
b) To comprehend socio-economic status of the people living in the study area.
c) To assess probable impact of the project on social and economic aspects in the study area.
d) To measure the impact of the project on Quality of life of the people living in the study area.
e) To ensure sustainability of positive impact.

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

SOCIO-ECONOMIC IMPACT OF THE PROJECT

Impact on Demographic Composition

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

Employment Opportunities

The proposed Project will provide employment to the local people. The number of workers to be deployed in the mining project will depend upon the quantity of minerals to be extracted from the mine by the lease holder. Both the miners and the unskilled workers will be recruited locally. It has estimated that around **94 people** will get employment in this mining project for a period of ten months in a year. It is a positive impact of the project since it is providing employment opportunities to the local people. The project will not affect the vulnerable groups of people.

Increased supply of sand in the market

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

Impact on agriculture

It is non-forest land and the proposed activity is to take place in the bed of the Dahuk, Gauriya, Mahananda, Mechi & Kankai river.. There will be no negative impact on agriculture as no cultivation is taking place on the proposed mining area. Since, scientific

mining will be adopted in the proposed mining project the area will be free from annual floods, which destroy standing crops and land & property. This is a positive impact of the proposed mining project.

Impact on road development

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

Income to Government

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

Impact on Law & Order

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

Impact on Health

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

Few safety measures are outlined below:

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

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

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

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

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

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

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

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

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

CONCLUSION

The commissioning of the Sand Mining Project (Kishanganj Unit - 05 Sand Ghat) at Riverbed of Dahuk, Gauriya, Mahananda, Mechi & Kankai River at District Kishanganj, (Bihar). provides employment to local people who are in search of the same. The granting of environment clearance to make mining of sand legally valid and it will generate

revenue for the state. It is expected that prospective entrepreneurs will venture to set up industrial units in the vicinity in the near future making the area a mixed society, dependent on industry, trade and business. With the implementation of the project the occupational pattern of the people in the area will change making more people engaged in mining, industrial and business activities rather in agriculture only. The study area is still lacking in health and educational facilities. It is expected that same will improve to a great extent with opening of the project and associated industrial & business activities.

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8.0 GENERAL

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

8.1 PHYSICAL BENEFITS

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

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

8.2 SOCIAL BENEFITS

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

lift the general health status of the residents of the area. Health camps, medical aids, family welfare programs, immunization camp, sports will be arranged.

Table-8.1, Budget for Public Health

S. No.	Activities recommended for communities level services	Tentative cost (Lakh Rs) For Each Mine
1	Awareness campaigns regarding health issues in the nearby villages.	1.0
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.	0.5
	Total	**2.5**

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

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

Table 8.2, Budget for Occupational Health

Particulars	Recurring Cost per year (Rs.) For Each Mine
For routine checkup	1,00,000
Medical aid as per ESI Scheme	2,00,000
Training	1,00,000
Total	**4,00,000**

8.3 ENVIRONMENTAL BENEFITS

a. Protection of banks

b. Reducing submergence of adjoining agricultural lands due to flooding.

c. Reducing aggradations of river level.

d. Protection of crops being cultivated along the bank.
e. A check on illegal mining activity.

8.4 CORPORATE ENVIRONMENTAL RESPONSIBILITY

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

CER cost will be 2% of the total project cost. This amount will be used for social welfare.

CER COST is Rs.. 4,97,45,000/-x 2% = Rs. 9,94,900/-

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

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9.0 INTRODUCTION

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

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

9.1 ENVIRONMENTAL MANAGEMENT CELL (EMC)

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

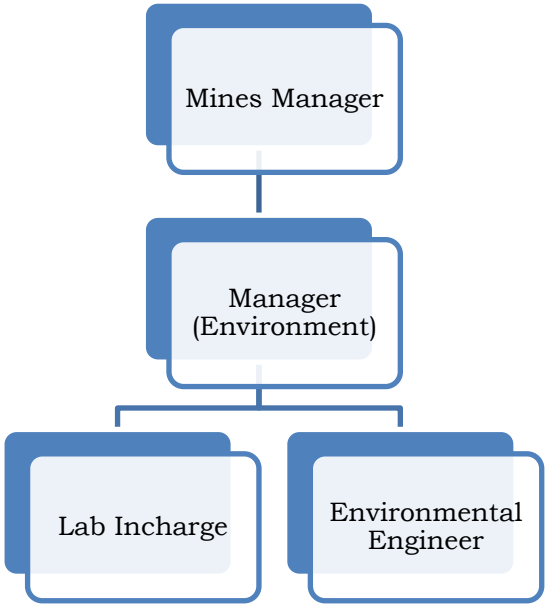

Figure 9.1 Environment Management Cell

The EMC will perform the following activities:

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

9.2 AIR POLLUTION CONTROL MEASURES

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

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

- Utmost care will be taken to prevent spillage of sand and stone from the trucks.
- Water sprinkling will be done to reduce the emission of dust due to transportation of minerals.
- Overloading will be prevented. The trucks/ tractor trolley will be covered by tarpaulin covers.
- Plantation activities in consultation with village Panchayat along the roads will also reduce the impact of dust in the nearby villages.

9.3 WATER POLLUTION CONTROL MEASURES

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

- Water requirements for drinking, plantation and dust suppression will be met by tanker supply on the daily basis.
- Local people will be employed and no permanent housing will be done so no permanent drainage pattern for sewerage system is required as domestic sewage shall be disposed off into septic tank followed by soak pits.
- Mining in the area will be done up to depth of 1.0mmaximum from the surface level well above the ground water table, therefore impact on water regime is not anticipated.
- Monitoring of water quality of nearby surface water, ground water and domestic water will be conducted once in every season except monsoon to evaluate the performance of the mitigation measures.

9.4 NOISE POLLUTION CONTROL MEASURES

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

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

9.5 BIOLOGICAL ENVIRONMENT

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

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

- **Greenery development:** The project will not lead to any tree cutting. However, a social responsibility, greenery will be developed along the both sides of road and the bank of river. Community services will be deployed in raising these plantations. Trees of economic importance and native origin such as fruit trees shall be planted.
- Approx. 910 trees will be planted around haul road during the plan period.
- The trees proposed for plantation are:
- As per Sustainable Sand Management & Mining Guidelines 2016,minimum 05 plant per hectare will be proposed for development of greenbelt but in this project 10 plants per hectare will be proposed for better condition of environment.

- Total Number of plants for cluster of Sand Blocks are given below.

Sand Ghat	Area (Ha)	Plants
Kishanganj Unit- 05 Sand Ghat	91.0	91.0*10 Plants= 910 plants
Total Plants		910 plants

Table 9.1:- List of Plant selected for Green Belt Development

	Agro-climatic zone & Sub zone	**Middle Genetic Plains, North west alluvial sub zone**	
S/n	**Scientific name**	**Common Name**	**Pollution control features**
1	*Acacia nilotica*	Babul	Tolerant to SO_2
2	*Mangiferaindica*	Aam	Tolerant to Dust control
3	*Tectonagrandis*	Sagon	Tolerant to Dust control
4	*Azadirachtaindica*	Neem	Tolerant to SO_2
5	*Pithecolibiumducle*	Jungle jalebi	Tolerant to SO_2 and Dust control
6	*Scigiumcumuni*	Jamun	To stop river bank erosion
7	*Terminaliaarjuna*	Arjun	To stop river bank erosion
8	*Populus ciliate*	Popular	Fast growing, broad leaf

9.6 LAND USE PLANNING

Deg6radation of land is not a very significant adverse impact of riverbed mining due to creation of access roads, mining operations, transportation of mined material. In order to prevent the environmental degradation of leased mine area and its surroundings, the following measures shall be taken;

- Mineral will be mined out after leaving sufficient safety zone from the bank as per sustainable sand mining guidelines-2016 for bank stability.
- The pits from where the material will be picked should not get deeper than 3.0 meter& shall follow the normal channel direction of the river.
- No foreign material shall be allowed to remain/spill in river bed and catchment area, or no pits/pockets will be allowed to be filled with such material.
- The mining is planned in non-monsoon seasons only, so that the excavated area gets replenished during the monsoon each year.
- Pits will get replenished naturally every year after monsoon.

9.7 OCCUPATIONAL HEALTH & SAFETY

Occupational safety and health is very closely related to productivity and good employer-employee relationship. The factor of occupational health in Sand Ghat of Geeta Enterprises Prop.- Geeta Sarswat S/o- Ram Pratap Sharma Add.- C-24 Narayan Vihar Colony, Bikaner, Rajasthan, Pin Code- 334001. (Kishanganj unit- 05 Sand Ghat), is mainly dust. Safety of employees during operation and maintenance etc. shall be as per Mines rules and regulations.

To avoid any adverse effect on the health of workers due to various pollutants, sufficient measures relating to safety and health will also be practiced:

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

- Training of employees for use of safety appliances and first aid in vocational training center.
- Regular maintenance and testing of all equipment as per manufacturers' guidelines.
- Periodical Medical Examination (PME) of all workers by a Medical Officer.
- First Aid facility will be provided at the mine site.
- Close surveillance of the factors in working environment and work practices which may affect environment and worker's health.
- Working of mine as per approved mining plan and environmental plans.

9.8 SOCIO-ECONOMIC ENVIRONMENT

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

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

9.9 ENVIRONMENT POLICY

Geeta Enterprises Prop.- Geeta Sarswat S/o- Ram Pratap Sharma Add.- C-24 Narayan Vihar Colony, Bikaner, Rajasthan, Pin Code- 334001. (Kishanganj unit- 05 Sand Ghat), of Sand Ghat believes that responsible environmental stewardship comprises diligent application of well-established natural resource management, controls and practices for the protection of the mined out land, preservation of biodiversity and proper disposal of waste if any following the best environmental practices during the process of mining.

Environmental policy prescribed for standard operating process to bring into focus any violation/deviation of the environment and forest norms/conditions that the company operations will implement operational and risk management practices that provide for

maximum protection of people and the environment. To this end, the owner resolves that company will follow the below mentioned practices:

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

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

9.10 BUDGET ALLOCATION FOR EMP IMPLEMENTATION

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

Table 9.2, Budget of EMP (Kishanganj Unit- 05 Sand Ghat)

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	--	1.5
2	Pollution Monitoring i) Air pollution ii) Water pollution iii) Soil pollution iv) Noise Pollution	--	2.0
3	Plantation and salary for one gardener (part time basis).	9.1	0.5
4	Haul road Maintenance Cost	17.325	1.5
TOTAL		**26.425**	**5.5**

Note: *910 plants * 1000 Rs (for each plants including hedges and fences) =Rs 9,10,000/-

- Salary of Labour for haul road maintenance 2 labor*300=600 per day
- 600* 250= 1,50,000/-
- * 2.5 lakh per kilometer (2,50,000 *6.93 km haul road) = 17,32,500 /-)

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10.0 INTRODUCTION

10.1 Purpose of the Report

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

10.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

10.2.1 Identification of Project

The Proposed Sand Mining Project is located on (Kishanganj Unit- 05 Sand Ghat) Sitaljhari Sand Ghat at Vill- Ratua Anchal Pothia, Sundarbari Sand Ghat at Vill.- Metihara Taluka, Anchal & Dist.- Kishanganj , Belwa Kashipur Sand Ghat at Vill.- Belwa Kashipur, Anchal & Dist.-Kishanganj , Teragachh Sand Ghat at Vill.- Hatgaon/Kamat , Anchal- Teragachh. Dist.- Kishanganj , Purandarpur Sand Ghat at Vill, Sakhuadali, Anchal- Thakurganj , Dist.- Kishanganj, Gambhirgadh Sand Ghat Vill.- Tatpaua , Anchal: Thakurganj , Palsa Sand Ghat at Vill: Palsa, Anchal: Dighalbank, Dist: Kishanganj. Dist.- Kishanganj Bihar.

The Proposed Production is 546000 cum/year or 1387380 Tonnes per annum and Area of the project site is 91.0 ha.

As per the Director of Geology, Bihar, the modification of mining plan has been approved .As per EIA notification 2016 and subsequent amendments, the project is coming under category '**B**' (**B1**) and the lease area is more than 5.0 Ha, approved Mining Plan, Pre-feasibility Report and EMP are required for Environment Clearance in respect of the said quarry lease. Copy of letter is enclosed as **Annexure No. II.**

10.3 BRIEF DESCRIPTION OF PROJECT

The proposed project is Open Cast Semi-Mechanized Mining of Sand with a proposed production of 546000 Cum/Year or 1387380 TPA. The project has been proposed by (Geeta Enterprises , Prop.- Geeta Sarswat S/o- Ram Pratap Sharma Add.- C-24 Narayan Vihar Colony, Bikaner, Rajasthan, Pin Code- 334001)

The proposed project is over an area 91.0 ha on Dahuk, Gauriya, Mahananda, Mechi & Kankai River at (Kishanganj Unit- 05 Sand Ghat) Sitaljhari Sand Ghat at Vill- Ratua Anchal Pothia, Sundarbari Sand Ghat at Vill.- Metihara Taluka, Anchal & Dist.- Kishanganj , Belwa Kashipur Sand Ghat at Vill.- Belwa Kashipur, Anchal & Dist.-Kishanganj , Teragachh Sand Ghat at Vill.- Hatgaon/Kamat , Anchal- Teragachh. Dist.- Kishanganj , Purandarpur Sand Ghat at Vill, Sakhuadali, Anchal- Thakurganj , Dist.- Kishanganj, Gambhirgadh Sand Ghat Vill.- Tatpaua , Anchal: Thakurganj , Palsa Sand Ghat at Vill: Palsa, Anchal: Dighalbank, Dist: Kishanganj. Dist.- Kishanganj Bihar.

As per MoEF, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as Category 'B-1'. The estimated project cost for the proposed project is Rs - 4,97,45,000/- (including auction cost).

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

Table: 10.1 Mine lease Co-ordinates
Kishanganj Cluster- 05 Sand Ghat

Co-ordinates				Ghat/ Address	River
Sitaljhari Sand Ghat	10.0	A	26°15'41.37"N 88° 5'14.10"E	Vill- Ratua Anchal Pothia, Dist - Kishanganj.	Dahuk
		B	26°15'39.26"N 88° 5'19.30"E		
		C	26°15'22.02"N 88° 5'9.62"E		
		D	26°15'24.36"N 88° 5'4.06"E		
Sundarbari Sand Ghat	10.0	A	26°12'33.72"N 87°59'50.07"E	Vill.- Metihara Taluka, Anchal & Dist:- Kishanganj.	Dahuk
		B	26°12'28.66"N 87°59'50.55"E		
		C	26°12'26.07"N 87°59'29.51"E		
		D	26°12'31.67"N 87°59'28.72"E		
Belwa Kashipur Sand Ghat	10.0	A	26°11'23.06"N 87°57'49.47"E	Vill: Belwa kashipur, Anchal & Dist: Kishanganj.	Dahuk
		B	26°11'17.72"N 87°58'15.59"E		
		C	26°11'13.72"N 87°58'14.52"E		

		D	26°11'18.88"N 87°57'48.40"E		
Teragachh Sand Ghat	1.0	A	26°23'33.31"N 87°42'40.34"E	Vill: Hatgaon/Kamat, Anchal- Teragachh, Dist: Kishanganj.	Gauriya
		B	26°23'34.32"N 87°42'43.19"E		
		C	26°23'31.87"N 87°42'45.45"E		
		D	26°23'30.79"N 87°42'41.86"E		
Purandarpur Sand Ghat	28.0	A	26°24’51.41”N 88°10’50.78”E	Vill, Sakhuadali, Anchal- Thakurganj. Dist: Kishanganj.	Mahananda
		B	26°24'45.54"N 88°10'54.85"E		
		C	26°24'27.33"N 88°10'29.29"E		
		D	26°24'38.26"N 88°10'21.54"E		
Gambhirgadh Sand Ghat	22.0	A	26°20'25.50"N 88° 1'58.69"E	Vill.- Tatpaua , Anchal: Thakurganj, Dist: Kishanganj.	Mechi
		B	26°20'19.41"N 88° 2'3.33"E		
		C	26°20'1.38"N 88° 1'34.60"E		
		D	26°20'6.27"N 88° 1'28.92"E		
Palsa Sand Ghat	10.0	A	26°26'28.48"N 87°47'35.48"E	Vill: Palsa, Anchal: Dighalbank, Dist: Kishanganj.	Kankai
		B	26°26'26.17"N 87°47'42.84"E		
		C	26°26'12.22"N 87°47'37.58"E		
		D	26°26'14.31"N 87°47'30.07"E		

The details of environmental setting are given in **Table-10.2**.

Table-10.2: Details of Environmental Setting

Sr. No.	Particulars	Details
1	**Location**	
a	Village	Ratua, Metihara Taluka, Belwa Kashipur, Hatgaon/Kamat, Sakhuadali, Tatpaua, Palsa

Project: Sand Mining Project (Kishanganj Unit- 05 Sand Ghat) at Riverbed of Dahuk, Gauriya, Mahananda, Mechi & Kankai River at District Kishanganj, (Bihar).

Sr. No.	Particulars	Details
b	District	Kishanganj
c	State	Bihar
2	Elevation above	Dahuk River Sitaljhari Sand Ghat (57.4 ASML to 55 ASML) Dahuk River Sundarbari Sand Ghat (49 ASML to 50.4 ASML) Dahuk River Belwa Kashipur Sand Ghat (48 ASML to 49.4 ASML) Gauriya River Teragachh Sand Ghat (61 ASML to 63.4 ASML) Mahananda River Purandarpur Sand Ghat (71 ASML to 72 ASML) Mechi River Gambhirgadh Sand Ghat (57 ASML to 58.4 ASML) Kankai River Palsa Sand Ghat (70 ASML to 71 ASML)
3	Nearest National /State Highway	NH 27 at distance of approx. 7 km in SE direction from Sitaljhari Sand Ghat, NH- 327 at distance of approx. 600 m in North -West from Gambhirgadh Sand Ghat and SH- 99 at distance of approx. 6 Km in SE from Palsa Sand ghat.
4	Nearest Railway station	Kishanganj Railway station at distance of 10.30 km in South-East from Belwa Kashipur Sand Ghat andPothia Railway station at distance of 10.50 km in North-East from Sitaljlhari Sand Ghat
5	Nearest Airport	JPN International Airport at a distance of 277 km in SW direction from Teragachh Sand Ghat
6	Ecological Sensitive Areas (Wildlife Sanctuaries)	There is no any Ecological Sensitive Areas Like National Park, Wildlife Sanctuaries, etc are found within 10 km of the study area.
7	Seismic Zone	Zone- V *Source BMTC 2nd edition https://www.bmtpc.org/disaster%20resistnace%20technolgies/ZONE%20IV.h*

Sr. No.	Particulars	Details
		tm

10.4 PROJECT DESCRIPTION

10.4.1 Salient features of mine lease

The salient features of mine lease are given below:

Table-10.3: Salient features of mine lease

Sr. No.	Parameter	Description
1	Name of the Mine	Sand Mining Project (Kishanganj Unit- 05 Sand Ghat) at Riverbed of Dahuk, Gauriya, Mahananda, Mechi & Kankai at District Kishanganj, (Bihar).
2	Mining Capacity	546000 Cum/Year or 1387380 TPA
3	Method of mining	Open cast semi-mechanized mining/OTFM
4	Total ML area	91.0 ha
5	Depth of mining	1.0 m depth
6	Manpower	94 persons
9	Water Requirement	47.0 KLD
10	Source of Water	Tanker/ Nearby village.

10.4.2 Mineral Reserves and production

Mineable reserves have been computed up to 1 m depth from surface. The volume multiplied by Specific Gravity is taken Dahuk River 2.55 (g/cm^3), Gauriya River 2.57 (g/cm^3), Mahananda River 2.54 (g/cm^3), Mechi River 2.52 (g/cm^3) & Kankai River 2.56 (g/cm^3) to get the tonnage.

Table 10.4 Classification Mineral Reserves

Sand Ghat	Area (Hect)	Geological Reserves (m3)	Mineable Reserves (m3)	Annual Permitted Reserve As per LoI (m3)
Kishanganj Unit 05	91.0	910000	811015	546000

The annual extractable RBM comes to 546000 cum or 1387380 tonnes.

In the lease area the river flow being reduced and sediment load get deposited. During flood season, the area gets replenished with sediments and source of erosion at this location. 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.

10.4.3 Conceptual Plan

Mine Applied Area will be worked for Kishanganj Unit- 05 Sand Ghat. However, as the digging depth will be restricted to 1.0 m only. This will be further replenished during rainy season. Balu Ghat will be worked systematically as the width is limited while length is much more. As the lease period is only 5 (Five) years, some of the area will be left un-worked at the end of lease period.

(i) Final Slope Angle to Be Adopted: Height of the bench is limited to 1 m while width of individual bench shall be kept 6.0 m. River bank side will be protected by working in dry part of the river and by leaving safety distance of the width of the river of 5 meter. Bank side natural slope will not be disturbed. This will prevent collapse of bank and erosion. However, the height of the bank with respect to river bed is varying from 3-4 meters.

(ii) During plan period workings will be carried out in the Balu ghat at a time of the Applied Area simultaneously. Scattered workings will ensure safety, remove congestion of vehicles and will have better control and management.

(iii)Ultimate Capacity of Dumps: There will be no OB removal / during the plan period. Therefore no proposal has been envisaged for its separate dumping. No outside material will be filled up in the extracted zone.

The conceptual plan & section of each mining plots are attached with mine plan.

10.4.4 Method of Mining

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

10.5 AFFORESTATION PROGRAMME

Topsoil if any would be utilized for intensive plantation and greenbelt development, all along the bank of the river. The details of plantation and number of saplings to be planted are given below. Approx. 910 trees will be planted around haul road during the plan period.

10.6 LAND USE PATTERN

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

10.7 BASELINE ENVIRONMENTAL STATUS

10.7.1 Soil Quality

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

10.7.2 Meteorology

Meteorological data at the site was monitored during March 2023 to May 2023 representing pre monsoon season. It was observed that the during study period, temperature ranged from 20 ^{0}C to 41 ^{0}C.

10.7.3 Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) has been carried out at 15 locations. The minimum and maximum level of PM10 recorded within the study area was in the range of 58.3 µg/m^{3}to 82.24µg/m^3. The Particulate Matter ($PM_{2.5}$) range of 31.72 µg/m^3 to 47.18µg/m^3. Sulphur dioxide (SO_2) between 3.90 µg/m^{3}to 15.33µg/m^3. Oxides of Nitrogen (NO_2) between 8.09 µg/m^{3}to 19.14 µg/m^3. The results thus obtained indicate that the concentrations of PM10, SO_2 and NO_2 in the ambient air are well within the National Ambient Air Quality (NAAQ) standards for Residential and Rural areas.

10.7.4 Water quality

The Ground water sampling was taken from 07 locations The analysis results indicate that the pH ranges between 6.93 to 7.27. Total hardness varies from 175 mg/l to 227 mg/l .& Total dissolved solids vary from 325 mg/l to 395 mg/l.

The results indicate groundwater is generally in conformity with the drinking water standards (IS: 10500).

10.7.5 Noise Quality

Noise monitoring reveals that the minimum & maximum noise levels at day time were recorded as 38.4dB(A) to 47.5 dB(A) respectively. The minimum & maximum noise levels at night time were found to be 32.5dB (A) & 40.8dB(A) respectively.

10.7.6 Ecological Environment

Based on the field studies and review of published literature, There is no any Ecological Sensitive Areas Like National Park, Wildlife Sanctuaries, etc are found within 10 km of the study area.

10.8 ANTICIPATED ENVIRONMENTAL IMPACTS

10.8.1 Impact on Air Environment

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

10.8.2 Impact on Water Environment

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

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

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

Project activity will be carried out only in the dry part of the Dahuk, Gauriya, Mahananda, Mechi & Kankai 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.

10.8.3 Impact on Water Quality

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

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

10.8.4 Impact on Noise Environment

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

10.8.5 Impact on Land Environment

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

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

10.8.6 Impact on flora and fauna

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

10.8.7 Impact on Socio - Economic Aspects

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

10.9 ENVIRONMENTAL MANAGEMENT PLAN

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

10.10 ENVIRONMENTAL MONITORING PROGRAM

Table 10.5: 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

10.11 ENVIRONMENTAL PROTECTION COST

The details of the cost to be incurred for successful monitoring of environmental parameters and implementation of control measures are given in **Table-10.6**.

Table 10.6: Cost of Environmental Protection Measures

Budget of EMP (Kishanganj Unit- 05 Sand Ghat)

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	--	1.5
2	Pollution Monitoring i) Air pollution ii) Water pollution iii) Soil pollution iv) Noise Pollution	--	2.0
3	Plantation and salary for one gardener (part time basis).	9.10	0.5
4	Haul road Maintenance Cost	17.325	1.5
TOTAL		**26.425**	**5.5**

Note: *910 plants * 1000 Rs (for each plants including hedges and fences) =Rs 9,10,000/-

- Salary of Labour for haul road maintenance 2 labor*300=600 per day
- 600* 250= 1,50,000/-
- * 2.5 lakh per kilometer (2,50,000 *6.93 km haul road) = 17,32,500 /-

10.12 ADDITIONAL STUDIES

10.12.1 Risk Assessment

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

10.12.2 Disaster Management Plan

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

10.12.3 Public Consultation

This is a draft EIA report. Public Hearing will be incorporated in FEIA report.

10.13 PROJECT BENEFITS

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

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

Environmental Benefits:

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

Corporate Social Responsibility

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

CER cost will be 2% of the total project cost. This amount will be used for social welfare.

CER COST is Rs. 4,97,45,000/-x 2% = Rs. 9,94,900/-

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

10.14 CONCLUSIONS

- The mining operations will meet the compliance requirements of MoEF&CC;
- Community impacts will be beneficial, as the project will generate significant economic benefits for the region;
- Monitoring program will be followed till the mining operations continue.
- With the effective implementation of the Environment Management Plan (EMP) during the mining activities, the proposed project can proceed without any significant negative impact on environment.

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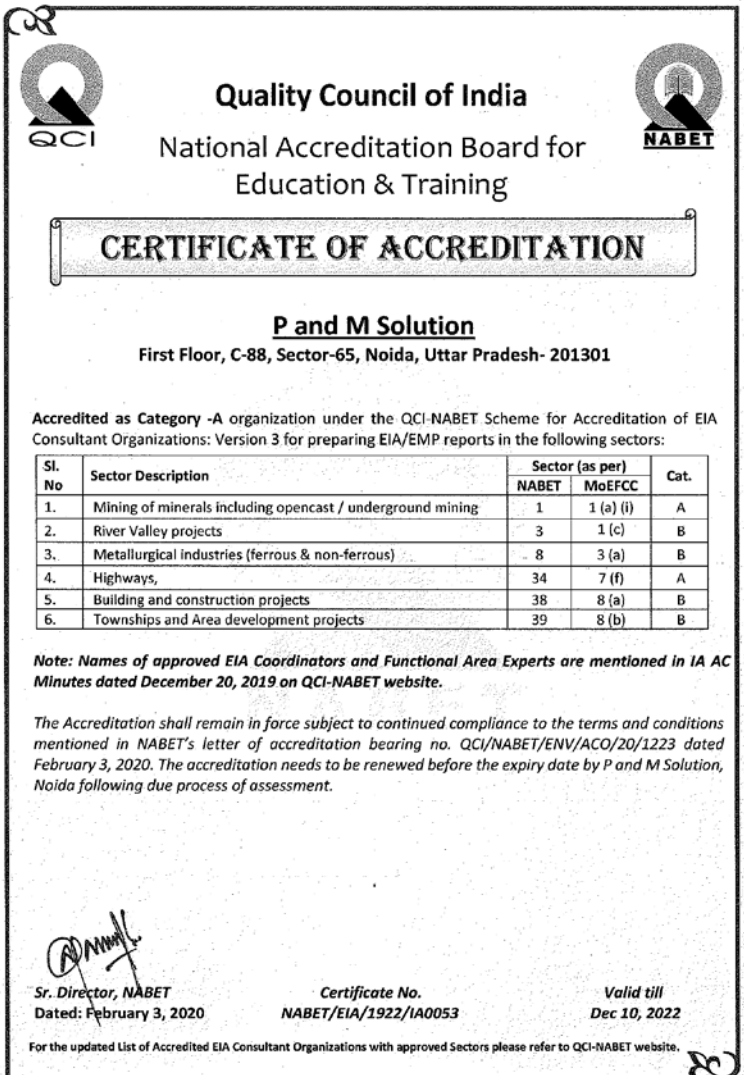
Project: Sand Mining Project (Kishanganj Unit- 05 Sand Ghat) at Riverbed of Dahuk, Gauriya, Mahananda, Mechi & Kankai River at District Kishanganj, (Bihar).

CONSULTANT

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

Consultant accreditation details are given below:



Quality Council of India

National Accreditation Board for Education & Training

CERTIFICATE OF ACCREDITATION

P and M Solution

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

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

Sl. No	Sector Description	Sector (as per) NABET	Sector (as per) MoEFCC	Cat.
1.	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2.	River Valley projects	3	1 (c)	B
3.	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	B
4.	Highways,	34	7 (f)	A
5.	Building and construction projects	38	8 (a)	B
6.	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IA AC Minutes dated December 20, 2019 on QCI-NABET website.

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

Sr. Director, NABET *Certificate No.* *Valid till*

Dated: February 3, 2020 *NABET/EIA/1922/IA0053* *Dec 10, 2022*

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

National Accreditation Board for Education and Training

QCI/NABET/ENV/ACO/23/2770 June 02, 2023

To

P and M Solution
C-88, Sector-65 Noida
Noida, UP

Sub.: Extension of Validity of Accreditation till Sept 01, 2023 – regarding
Ref.. 1. Certificate no. NABET/EIA/1922/IA0053
2. Request e-mail dated May 30, 2023

Dear Sir/Madam

This has reference to the accreditation of your organization under the QCI-NABET EIA Scheme, the validity of **P and M Solution** is hereby extended till Sept 01, 2023 or completion of the assessment process, whichever is earlier.

The above extension is subject to the submitted documents/required information with respect to your application and timely submission and closure of NC/Obs during the process of assessment.

You are requested not to use this letter after expiry of the above stated date.

With best regards.

(A K Jha)
Sr. Director, NABET

Institute of Town Planners India, 6th Floor, 4-A, Ring Road, I.P Estate, New Delhi-110 002, India
Tel. : +91-11-233 23 416, 417, 418, 419, 420, 421, 423 E-mail : ceo.nabet@qcin.org Website : www.qcin.org

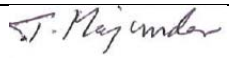
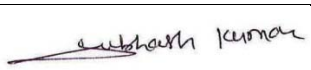
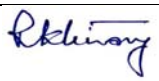
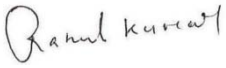
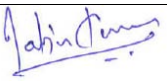
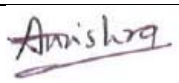
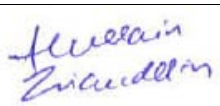
Project: Sand Mining Project (Kishanganj Unit- 05 Sand Ghat) at Riverbed of Dahuk, Gauriya, Mahananda, Mechi & Kankai River at District Kishanganj, (Bihar).

Consultant Contact Details:

P and M Solution

Address –C-88, Sector 65 Noida

Mobile no. - +8377871554, 8826287364

S No	Name	EC/FAE	DETAILS	Signatures
1	Pravin Kumar Sinha	EC	EC	
2	Tapan Majumdar	FAE	HG, GEO	
3	Subhash Kumar	FAE	SC	
4	Manoj Kumar	FAE	EB	
5	R K Tiwary	FAE	RH,AP	
6	Rahul Kumar	FAE	AQ	
7	Jatin Kumar Srivastava	FAE	NV	
8	Abhay Nath Mishra	FAE	SE	
9	Hussain Ziauddin	FAE	WP	
10	Poonam Kumari Mangalam	FAE	LU	

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EXECUTIVE SUMMARY

FOR

SAND MINING PROJECT
(KISHANGANJ UNIT 05 SAND GHAT) DISTRICT KISHANGANJ

At

Village- Ratua, Metihara Taluka, Belwa Kashipur, Hatgaon/Kamat, Sakhuadali, Tatpaua, Palsa Anchal– Pothia, Kishanganj Tergachh, Thakurganj, Dighalbank, District – Kishanganj, (Bihar).

AREA	**Total Area – 91.0 Ha.** Sitaljhari Sand Ghat – Area – 10.0 Hect. Sundarbari Sand Ghat – Area – 10.0 Hect. Belwa Kashipur Sand Ghat – Area – 10.0 Hect. Teragachh Sand Ghat – Area – 1.0 Hect. Purandarpur Sand Ghat – Area – 28.0 Hect. Gambhirgadh Sand Ghat – Area – 22.0 Hect Palsa Sand Ghat – Area – 10.0 Hect
PRODUCTION	**546000 CUM per annum or 1387380 TPA**

PROJECT PROPONENT

Geeta Enterprises

Prop.- Geeta Sarswat

S/o- Ram Pratap Sharma

Add.- C-24 Narayan Vihar Colony, Bikaner, Rajasthan,

Pin Code- 334001.

Environment Consultant

P and M Solution

(Accredited by QCI/NABET)

Accreditation No. : NABET/EIA/1992/IA0053

C-88, Sector 65 Noida

www.pmsolution.in

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 'B1'** project.

Kishanganj Unit- 05

The Proposed Sand Mining Project is located on (Kishanganj Unit- 05 Sand Ghat) Sitaljhari Sand Ghat at Vill- Ratua Anchal Pothia, Sundarbari Sand Ghat at Vill.- Metihara Taluka, Anchal & Dist.- Kishanganj , Belwa Kashipur Sand Ghat at Vill.- Belwa Kashipur, Anchal & Dist.- Kishanganj , Teragachh Sand Ghat at Vill.- Hatgaon/Kamat , Anchal- Teragachh. Dist.- Kishanganj , Purandarpur Sand Ghat at Vill, Sakhuadali, Anchal- Thakurganj , Dist.- Kishanganj, Gambhirgadh Sand Ghat Vill.- Tatpaua , Anchal: Thakurganj , Palsa Sand Ghat at Vill: Palsa, Anchal: Dighalbank, Dist: Kishanganj. Dist.- Kishanganj Bihar.

LOI issued to lessee via letter no 31/khanan, Kishanganj, dated. 06.01.2023.The Draft EIA report has been prepared according to EIA notification 2006 and its subsequent amendment thereof. TOR of the proposed project has been issued by SEIAA Bihar dated 01-06-2023.

It has been proposed to mine around 1387380 Tonnes per annum for applied lease. The estimated project cost for the proposed project is **Rs.** 4,97,45,000/- (including auction cost)

PROJECT DESCRIPTION

LOCATION

Kishanganj Unit- 05

The lease area is located in at District- Kishanganj, (Bihar).. The mine lease co-ordinates are listed below:

Pillar Co-ordinates
(Kishanganj Unit- 05 Sand Ghat)

Co-ordinates				Ghat/ Address	River
Sitaljhari Sand Ghat	10.0	A	26°15'41.37"N 88° 5'14.10"E	Vill- Ratua Anchal Pothia, Dist - Kishanganj.	Dahuk
		B	26°15'39.26"N 88° 5'19.30"E		
		C	26°15'22.02"N 88° 5'9.62"E		

		D	26°15’24.36”N 88° 5’4.06”E		
Sundarbari Sand Ghat	10.0	A	26°12'33.72"N 87°59'50.07"E	Vill.- Metihara Taluka, Anchal & Dist:- Kishanganj.	Dahuk
		B	26°12'28.66"N 87°59'50.55"E		
		C	26°12'26.07"N 87°59'29.51"E		
		D	26°12'31.67"N 87°59'28.72"E		
Belwa Kashipur Sand Ghat	10.0	A	26°11'23.06"N 87°57'49.47"E	Vill: Belwa kashipur, Anchal & Dist: Kishanganj.	Dahuk
		B	26°11'17.72"N 87°58'15.59"E		
		C	26°11'13.72"N 87°58'14.52"E		
		D	26°11'18.88"N 87°57'48.40"E		
Teragachh Sand Ghat	1.0	A	26°23'33.31"N 87°42'40.34"E	Vill: Hatgaon/Kamat, Anchal- Teragachh, Dist: Kishanganj.	Gauriya
		B	26°23'34.32"N 87°42'43.19"E		
		C	26°23'31.87"N 87°42'45.45"E		
		D	26°23'30.79"N 87°42'41.86"E		
Purandarpur Sand Ghat	28.0	A	26°24’51.41”N 88°10’50.78”E	Vill, Sakhuadali, Anchal- Thakurganj. Dist: Kishanganj.	Mahananda
		B	26°24'45.54"N 88°10'54.85"E		
		C	26°24'27.33"N 88°10'29.29"E		
		D	26°24'38.26"N 88°10'21.54"E		
Gambhirgadh Sand Ghat	22.0	A	26°20'25.50"N 88° 1'58.69"E	Vill.- Tatpaua , Anchal: Thakurganj, Dist: Kishanganj.	Mechi
		B	26°20'19.41"N 88° 2'3.33"E		
		C	26°20'1.38"N 88° 1'34.60"E		
		D	26°20'6.27"N 88° 1'28.92"E		
Palsa Sand Ghat	10.0	A	26°26'28.48"N 87°47'35.48"E	Vill: Palsa, Anchal: Dighalbank, Dist: Kishanganj.	Kankai
		B	26°26'26.17"N 87°47'42.84"E		
		C	26°26'12.22"N 87°47'37.58"E		
		D	26°26'14.31"N 87°47'30.07"E		

Area & production: The total ML area is 91.0 Ha. Proposed rate of production will be 1387380 TPA.

Connectivity:

Kishanganj Unit- 05

Nearest Railway Station	Kishanganj Railway station at distance of 10.30 km in South-East from Belwa Kashipur Sand Ghat and Pothia Railway station at distance of 10.50 km in North-East from Sitaljlhari Sand Ghat
Nearest Airport	JPN International Airport at a distance of 277 km in SW direction from Teragachh Sand Ghat
Nearest Highway	NH 27 at distance of approx. 7 km in SE direction from Sitaljlhari Sand Ghat, NH- 327 at distance of approx. 600 m in North -West from Gambhirgadh Sand Ghat and SH- 99 at distance of approx. 6 Km in SE from Palsa Sand ghat.

Salient Features of Project

Name of the applicant	Geeta Enterprises Prop.- Geeta Sarswat
Address of Lessee	Geeta Enterprises Prop.- Geeta Sarswat S/o- Ram Pratap Sharma Add.- C-24 Narayan Vihar Colony, Bikaner, Rajasthan, Pin Code- 334001
Name of Mine	Sand Mining Project (Kishanganj Unit- 05 Sand Ghat) at Riverbed of Dahuk, Gauriya, Mahananda, Mechi & Kankai River at District Kishanganj, (Bihar).
Village	Ratua, Metihara Taluka, Belwa Kashipur, Hatgaon/Kamat, Sakhuadali, Tatpaua, Palsa
District & State	Kishanganj, Bihar
Mineral	Sand
Man Power	94
Area (ha)	91.0 ha

MINING

The mining process is opencast semi-mechanized method without drilling & blasting. This is an open-cast mining project. The operation will be semi-mechanized/OTFM with use of excavators/JCBs truck /tractors combination or Manually etc. The sand will be collected in its existing form.

The mining will be done in a rotational way. As the working is going to be methodical i.e. mining will be done in benches. There would be no risk to the employee working in the mines.

Mining will be done in layers.

The deposit will be worked from the surface of the bed up to 01 m bgl or above ground water level, whichever comes first. Hence, at no point of time mining will intersect with ground water table. Mining will be done only during the day time and completely stopped during the monsoon season.

RESERVE AND PRODUCTION

Mineable reserves have been computed up to 1 m depth from surface. The volume multiplied by Specific Gravity is taken Dahuk River 2.55 (g/cm^3), Gauriya River 2.57 (g/cm^3), Mahananda River 2.54 (g/cm^3), Mechi River 2.52 (g/cm^3) & Kankai River 2.56 (g/cm^3) to get the tonnage.

The bench-wise annual exploitation of sand of is given below:

Kishanganj Unit- 05 Sand Ghat

Dahuk River Sitaljlhari Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
57-56	585	151	1	88335	225255
Total				88335	225255

Dahuk River Sundarbari Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
50-49	576	154	1	88704	226195
Total				88704	226195

Dahuk River Belwa Kashipur Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
49-48	837	101	1	84537	215570
Total				84537	215570

Gauriya River Teragachh Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
62-61	93	77	1	7161	18404
Total				7161	18404

Mahananda River Purandarpur Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
72-71	891	281	1	250371	635942
Total				250371	635942

Mechi River Gambhirgadh Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
58-57	978	207	1	202446	510164
Total				202446	510164

Kankai River Palsa Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
71-70	653	137	1	89461	229020
Total				89461	229020

Total Mineable Reserve of Dahuk River Sitaljlhari, Sundarbari, Belwa Kashipur Sand Ghat, Gauriya River Teragachh Sand Ghat, Mahananda River Purandarpur Sand Ghat, Mechi River Gambhirgadh Sand Ghat & Kankai River Palsa Sand Ghat = 811015 cum or 2060550 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 will be provided to workers for drinking & domestic purpose. Water will also be required for dust suppression. A total water of **47.0 KLD** will be required for the proposed project. 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 along with anti-venoms to counteract poison produced by certain species of small insects, if any and sanitation facility i.e. septic tank or community toilet facility will be provided for the workers.

BASELINE ENVIRONMENTAL STATUS

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

Meteorology

The Summarized Meteorological Data for the Monitoring Period March 2023 to May 2023) is given below:

Month	Temperature °C			Wind Speed (Km/Hr)	
	Min	Average	Max	Min	Max
MARCH 2023	20	27	37	11.5	19.9
APRIL 2023	24	32	41	12	20.6
MAY 2023	25	31	39	15	24.2

Table Baseline Environmental Status

Attribute	Baseline status
Ambient Air Quality	Ambient Air Quality Monitoring reveals that the minimum & maximum concentrations of PM2.5 amongst all the 15 AQ monitoring stations were found to be 31.72 µg/m^3 to 47.18µg/m^3 respectively; PM10 was in the range of 58.3 µg/$m^3$to 82.24µg/m^3. As far as the gaseous pollutants SO2 and NO2 are concerned, the prescribed CPCB limit of 80 µg/m3 for residential and rural areas has never been surpassed at any station.
Noise Levels	The results of the monitoring program indicated that both the

	daytime and night time levels of noise were well within the prescribed limits of NAAQS, at all the 15 locations monitored.
Water Quality	The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards promulgated by IS: 10500.
Soil Quality	Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from 7.39 to 8.37 which shows that the soil is slightly alkaline in nature.
Ecology and Biodiversity	There is no Ecological Sensitive Areas are found within 10 km of the study area.

ANTICIPATED ENVIRONMENTALIMPACTS

Impact on Air Environment

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

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 Dahuk, Gauriya, Mahananda, Mechi & Kankai 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/thrice 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

Public hearing is yet to be conducted.

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 SOCIAL RESPONSIBILITY

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

CER cost for Kishanganj Unit- 05 Sand Ghat will be 2% of the total project cost. This amount will be used for social welfare. CSR COST is Rs. 4,97,45,000/-x 2% = Rs. 9,94,900/-

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

❖ PLANTATION:

- The project will not lead to any tree cutting. However, asocial responsibility, greenery will be developed along the both sides of road and the bank of river. Community services will be deployed in raising these plantations. Trees of economic importance and native origin such as fruit trees shall be planted.
- Approx. **910 trees** will be planted around haul road during the plan period.
- The trees proposed for plantation are:
- As per Sustainable Sand Management & Mining Guidelines 2016,minimum 5 plant per hectare will be proposed for development of greenbelt but in this cluster of projects 10 plants per hectare will be proposed for better condition of environment.
- Peepal, Arjun, Jamun, Banyan, Neem, Mango etc trees will be planted.

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.

BUDGET ALLOCATION FOR EMP IMPLEMENTATION

Table, Budget of EMP (Kishanganj Unit- 05 Sand Ghat)

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	--	1.5
2	Pollution Monitoring i) Air pollution ii) Water pollution iii) Soil pollution iv) Noise Pollution	--	2.0
3	Plantation and salary for one gardener (part time basis).	9.10	0.5
4	Haul road Maintenance Cost	17.325	1.5
TOTAL		**26.425**	**5.5**

Note: *910 plants * 1000 Rs (for each plants including hedges and fences) =Rs 9,10,000/-

- Salary of Labour for haul road maintenance 2 labor*300=600 per day
- 600* 250= 1,50,000/-
- * 2.5 lakh per kilometer (2,50,000 *6.93 km haul road) = 17,32,500 /-)

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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कार्यकारी सारांश

बालू खनन परियोजना

(किशनगंज यूनिट 05 बालू घाट) जिला- किशनगंज

के लिए,

ग्राम- रतुआ, मेतिहारा तालुका, बेलवा काशीपुर, हाटगांव/कामत, सखुआडाली, तातपौआ, पलसा, अंचल- पोठिया, किशनगंज टेढ़ागाछ, ठाकुरगंज, दिघलबैंक, जिला -किशनगंज, बिहार

क्षेत्रफल	**कुल क्षेत्रफल – 91.0 हेक्टेयर** शीतलझाड़ी बालूघाट - क्षेत्रफल – 10.0 हेक्टेयर सुन्दरबाड़ी बालूघाट - क्षेत्रफल - 10.0 हेक्टेयर बेलवा काशीपुर बालूघाट - क्षेत्रफल – 10.0 हेक्टेयर टेढ़ागाछ बालूघाट - क्षेत्रफल - 1.0 हेक्टेयर पुरन्दरपुर बालूघाट - क्षेत्रफल – 28.0 हेक्टेयर गम्भीरगढ़ बालूघाट - क्षेत्रफल – 22.0 हेक्टेयर पलसा बालूघाट - क्षेत्रफल – 10.0 हेक्टेयर
उत्पादन	**546000 घनमीटर प्रति वर्ष या 1387380 टन प्रति वर्ष**

आवेदन कर्ता

गीता इंटरप्राईजेज

प्रो०- गीता सारस्वत

पिता- राम प्रताप शर्मा

पता- सी-24 नारायण विहार कॉलोनी, बीकानेर, राजस्थान, पिन कोड- 334001.

एनवायरनमेंट कन्सल्टेंट

पी & एम सल्यूशन

(क्वालिटी कौंसिल ऑफ़ इंडिया द्वारा मान्यता प्राप्त)

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कार्यकारी सारांश

❖ परिचय

MoEF & CC (एमओईएफ एंड सीसी), नई दिल्ली राजपत्र दिनांक 14 सितंबर 2006 और उसमें समय समय पर किये गए संशोधन के अनुसार, प्रस्तावित खनन परियोजना को श्रेणी 'बी1' परियोजना के रूप में वर्गीकृत किया गया है।

किशनगंज यूनिट - 05

परियोजना के प्रस्ताव गीता इंटरप्राईजेज प्रो- गीता सारस्वत ने दिया है। प्रस्तावित बालू खनन परियोजना (किशनगंज यूनिट - 05 बालू घाट) शीतलझाड़ी बालू घाट जो ग्राम- रतुआ, सुन्दरबाड़ी बालू घाट ग्राम- मेतिहारा तालुका, बेलवा काशीपुर बालू घाट ग्राम- बेलवा काशीपुर, टेढ़ागाछ बालू घाट ग्राम- हाटगांव/कामत, पुरन्दरपुर बालू घाट ग्राम- सखुआडाली, गम्भीरगढ़ बालू घाट जो ग्राम- तातपौआ, पलसा बालूघाट ग्राम- पलसा जिला- किशनगंज (बिहार) में स्थित है।

एलओआई पत्र संख्या 31/खनन, किशनगंज दिनांक 06.01.2023 के माध्यम से पट्टेदार को जारी किया गया। ईआईए अधिसूचना 2006 और इसके बाद के संशोधन के अनुसार ड्राफ्ट ईआईए रिपोर्ट तैयार की गई है। प्रस्तावित परियोजना का टीओआर SEIAA बिहार दिनांक 01-06-2023 द्वारा जारी किया गया है।

आवेदित पट्टे के लिए प्रति वर्ष लगभग 1387380 टन खनन प्रस्तावित किया गया है, प्रस्तावित परियोजना के लिए अनुमानित परियोजना लागत 4,97,45,000/- रुपये (नीलामी लागत सहित) है।

❖ परियोजना विवरण

❖ स्थान

किशनगंज यूनिट- 05

पट्टा क्षेत्र ग्राम- रतुआ, मेतिहारा तालुका, बेलवा काशीपुर, हाटगांव/कामत, सखुआडाली, तातपौआ, पलसा अंचल- पोठिया, किशनगंज टेढ़ागाछ, ठाकुरगंज, दिघलबैंक, जिला- किशनगंज, राज्य- बिहार में स्थित है। खनन पट्टा समन्वय नीचे सूचीबद्ध हैं:

स्तंभ निर्देशांक

(किशनगंज यूनिट- 05 बालू घाट)

बालू घाट	क्षेत्रफल (हे.)	निर्देशांक		घाट का पता
शीतलझाड़ी बालू घाट	10.0	A	26°15’41.37”N 88° 5’14.10”E	ग्राम- रतुआ, जिला- किशनगंज, बिहार
		B	26°15’39.26”N 88° 5’19.30”E	
		C	26°15’22.02”N 88° 5’9.62”E	
		D	26°15’24.36”N 88° 5’4.06”E	
सुन्दरबाड़ी बालू घाट	10.0	A	26°12'33.72"N 87°59'50.07"E	ग्राम- मेतिहारा तालुका, जिला- किशनगंज, बिहार
		B	26°12'28.66"N 87°59'50.55"E	
		C	26°12'26.07"N 87°59'29.51"E	
		D	26°12'31.67"N 87°59'28.72"E	
बेलवा काशीपुर बालू घाट	10.0	A	26°11'23.06"N 87°57'49.47"E	ग्राम- बेलवा काशीपुर, जिला- किशनगंज, बिहार
		B	26°11'17.72"N 87°58'15.59"E	
		C	26°11'13.72"N 87°58'14.52"E	
		D	26°11'18.88"N 87°57'48.40"E	
टेढ़ागाछ बालू घाट	1.0	A	26°23'33.31"N 87°42'40.34"E	ग्राम- हाटगांव/कामत जिला- किशनगंज, बिहार
		B	26°23'34.32"N 87°42'43.19"E	
		C	26°23'31.87"N 87°42'45.45"E	
		D	26°23'30.79"N 87°42'41.86"E	
पुरन्दरपुर बालू घाट	28.0	A	26°24’51.41”N 88°10’50.78”E	ग्राम- सखुआडाली जिला- किशनगंज, बिहार
		B	26°24'45.54"N 88°10'54.85"E	
		C	26°24'27.33"N 88°10'29.29"E	
		D	26°24'38.26"N 88°10'21.54"E	
गम्भीरगढ़ बालू	22.0	A	26°20'25.50"N 88° 1'58.69"E	ग्राम- तातपौआ, जिला-

घाट		B	26°20'19.41"N 88° 2'3.33"E	किशनगंज, बिहार
		C	26°20'1.38"N 88° 1'34.60"E	
		D	26°20'6.27"N 88° 1'28.92"E	
पलसा बालू घाट	10.0	A	26°26'28.48"N 87°47'35.48"E	ग्राम- पलसा, जिला- किशनगंज, बिहार
		B	26°26'26.17"N 87°47'42.84"E	
		C	26°26'12.22"N 87°47'37.58"E	
		D	26°26'14.31"N 87°47'30.07"E	

क्षेत्र और उत्पादन: कुल एमएल क्षेत्र 91.0 हेक्टेयर है। उत्पादन की प्रस्तावित दर 1387380 टीपीए होगी।

❖ **संयोजकता**

किशनगंज यूनिट- 05

निकटतम रेलवे स्टेशन	किशनगंज रेलवे स्टेशन बेलवा काशीपुर बालूघाट से दक्षिण- पूर्व में 10.30 किमी की दूरी पर , पोठिया रेलवे स्टेशन शीतलझाड़ी बालूघाट से उत्तर पूर्व में 10.50 किमी की दूरी पर है।
निकटतम हवाई अड्डा	जेपीएन अंतर्राष्ट्रीय हवाई अड्डा टेढ़ागाछ बालूघाट से दक्षिण पश्चिम दिशा में 277 किमी की दूरी पर है।
निकटतम राजमार्ग	राष्ट्रीय राजमार्ग एनएच 27 शीतलझाड़ी बालूघाट से दक्षिण- पूर्व में 07 किमी की दूरी पर , गम्भीरगढ़ बालूघाट से राष्ट्रीय राजमार्ग एसएच-327 लगभग 0.60 कि.मी की दूरी पर उत्तर पश्चिम में और पलसा रेत घाट से एसएच- 99 दक्षिण पूर्व में लगभग 6 कि.मी. की दूरी पर है।

❖ **परियोजना की मुख्य विशेषताएं**

किशनगंज यूनिट- 05

आवेदक का नाम	गीता इंटरप्राईजेज प्रो- गीता सारस्वत
पट्टेदार का पता	गीता इंटरप्राईजेज प्रो- गीता सारस्वत पिता- राम प्रताप शर्मा पता- सी-24 नारायण विहार कॉलोनी, बीकानेर, राजस्थान, पिन कोड- 334001.
नाम	बालू खनन परियोजना (किशनगंज यूनिट 05 बालू घाट) जिला- किशनगंज
गाँव	रतुआ, मेतिहारा तालुका, बेलवा काशीपुर, हाटगांव/कामत, सखुआडाली, तातपौआ, पलसा
जिला और राज्य	किशनगंज, बिहार
खनिज	बालू
श्रम शक्ति	94
क्षेत्र (हेक्टेयर)	91.0 हेक्टेयर

❖ **ड्रिलिंग**

ड्रिलिंग और ब्लास्टिंग की आवश्यकता नहीं है।

❖ **खनिज का उपयोग**

बालू का उपयोग निर्माण कार्यों में किया जाता है सड़क निर्माण में भी इसका उपयोग किया जाता है

❖ **खनन**

खनन प्रक्रिया ड्रिलिंग और ब्लास्टिंग के बिना खुली अर्ध-मशीनीकृत विधि है। यह एक ओपन कास्ट माइनिंग प्रोजेक्ट है। उत्खनन/जेसीबी ट्रक/ट्रैक्टर संयोजन या मैन्युअल आदि के उपयोग के साथ संचालन अर्ध-मशीनीकृत/ओटीएफएम होगा। बालू को अपने मौजूदा रूप में एकत्र किया जाएगा।

खनन रोटेशनल तरीके से किया जाएगा। चूंकि काम व्यवस्थित होने जा रहा है यानी बेंचों में खनन किया जाएगा। खदान में काम करने वाले कर्मचारी को कोई खतरा नहीं होगा। खनन परतों में किया जाएगा।

निक्षेप को संस्तर की सतह से 1 एमबीजीएल या भूजल स्तर से ऊपर, जो भी पहले आए, तक कार्य किया जाएगा। इसलिए, किसी भी समय खनन भूजल स्तर को नहीं काटेगा। खनन केवल दिन के समय किया जाएगा और मानसून के मौसम में पूरी तरह बंद कर दिया जाएगा।

❖ **रिजर्व और उत्पादन**

खनन योग्य भंडार की गणना सतह से 1 मीटर की गहराई तक की गई है। विशिष्ट गुरुत्व से गुणा की गई मात्रा डांक नदी 2.55 (जी/सेमी3) , गौरया नदी 2.57 (जी/सेमी3) , महानंदा नदी 2.54 (जी/सेमी3), मेची नदी 2.52 (जी/सेमी3) और कनकई नदी 2.56 (जी/सेमी3) लिया गया है।

हर साल मानसून के मौसम के दौरान नदी तल से उत्खनन किए गए खनिजों की फिर से भरपाई (रिप्लेनिशमेंट) हो जाएग। नदी के पैलियो चैनल से संबंधित क्षेत्र को समतल करके वापस बहाल किया जाएगा।

बेंचवार बालू का वार्षिक दोहन नीचे दिया गया है:

किशनगंज यूनिट 05 बालू घाट

शीतलझाड़ी बालूघाट

बेंच स्तर (mRL)	लंबाई (M)	चौड़ाई (M)	गहराई (M)	मात्रा (घन मीटर)	टन
57-56	585	151	1	88335	225255
कुल				88335	225255

सुन्दरबाड़ी बालू घाट

बेंच स्तर (mRL)	लंबाई (M)	चौड़ाई (M)	गहराई (M)	मात्रा (घन मीटर)	टन
50-49	576	154	1	88704	226195
कुल				88704	226195

बेलवा काशीपुर बालू घाट

बेंच स्तर (mRL)	लंबाई (M)	चौड़ाई (M)	गहराई (M)	मात्रा (घन मीटर)	टन
49-48	837	101	1	84537	215570
कुल				84537	215570

टेढ़ागाछ बालू घाट

बेंच स्तर (mRL)	लंबाई (M)	चौड़ाई (M)	गहराई (M)	मात्रा (घन मीटर)	टन
62-61	93	77	1	7161	18404
कुल				7161	18404

पुरन्दरपुर बालू घाट

बेंच स्तर (mRL)	लंबाई (M)	चौड़ाई (M)	गहराई (M)	मात्रा (घन मीटर)	टन
72-71	891	281	1	250371	635942
कुल				250371	635942

गम्भीरगढ़ बालू घाट

बेंच स्तर (mRL)	लंबाई (M)	चौड़ाई (M)	गहराई (M)	मात्रा (घन मीटर)	टन
58-57	978	207	1	202446	510164
कुल				202446	510164

पलसा बालू घाट

बेंच स्तर (mRL)	लंबाई (M)	चौड़ाई (M)	गहराई (M)	मात्रा (घन मीटर)	टन
71-70	653	137	1	89461	229020
कुल				89461	229020

कुल खनन योग्य भंडार = 811015 घन मीटर या 2060550 टन

यह नदी तल जमा है और खनन क्षेत्र हर साल मानसून अवधि के दौरान फिर से भर जाएगा और खदान की गहराई हर साल नदी की बालू से भर जाएगा (रिप्लेनिशमेंट) और क्षेत्र अपनी मूल स्थलाकृति बहाल को कर देगा।

❖ **साइट सुविधाएं और उपयोगिताएँ**

- **जलापूर्ति**

श्रमिकों को पीने व घरेलू उपयोग के लिए पानी उपलब्ध कराया जाएगा। धूल के दमन के लिए भी पानी की आवश्यकता होगी। प्रस्तावित परियोजना के लिए 47.0 केएलडी के जल की आवश्यकता होगी। ताजे पानी का उपयोग केवल पीने के उद्देश्य के लिए किया जाएगा। आसपास के गांव के उपलब्ध स्रोतों से पानी की आपूर्ति की जाएगी।

- **अस्थायी विश्राम गृह**
- विश्राम के लिए स्थल के पास श्रमिकों के लिए एक अस्थायी विश्राम आश्रय प्रदान किया जाएगा। इसके अलावा, छोटे कीड़ों की कुछ प्रजातियों द्वारा उत्पादित जहर का मुकाबला करने के लिए एंटी-वेनम के साथ प्राथमिक उपचार बॉक्स, यदि कोई हो और श्रमिकों के लिए स्वच्छता सुविधा जैसे सेप्टिक टैंक या सामुदायिक शौचालय की सुविधा प्रदान की जाएगी।

- **आधारभूत पर्यावरणीय स्थिति**

वायु, ध्वनि, जल, मिट्टी, वनस्पति एवं जीव-जन्तुओं के लिए प्रस्तावित खनन के संबंध में पर्यावरणीय डाटा एकत्र किया गया है। बेसलाइन पर्यावरण अध्ययन मार्च 2023 से मई 2023 तक प्री मानसून सीजन के मौसम के दौरान खनन पट्टा क्षेत्र के आसपास 10 किमी की रेडियल दूरी वाले क्षेत्र में किया गया था।

- **मौसम विज्ञान**

निगरानी अवधि मार्च 2023 से मई 2023 के लिए संक्षिप्त मौसम संबंधी डेटा नीचे दिया गया है:

महीना	**तापमान °C**			**हवा की गति (किमी/घंटा)**	
	न्यूनतम	**औसतन**	**अधिकतम**	**औसत**	**अधिकतम**

मार्च 2022	20	27	37	11.5	19.9
अप्रैल 2023	24	32	41	12	20.6
मई 2023	25	31	39	15	24.2

आधारभूत पर्यावरणीय स्थिति

गुण	आधारभूत स्थिति
एम्बिएंट(परिवेशी) वायु गुणवत्ता	एम्बिएंट (परिवेशी) वायु गुणवत्ता निगरानी से पता चलता है कि सभी 15 AQ निगरानी स्टेशनों में PM2.5 की न्यूनतम और अधिकतम सांद्रता क्रमशः 31.72µg/m3 से 47.18µg/m3 पाई गई; PM10 58.3 µg/m3to 82.24 µg/m3 की सीमा में था जहां तक गैसीय प्रदूषकों SO2 और NO2 का संबंध है, आवासीय और ग्रामीण क्षेत्रों के लिए 80 µg/m3 की निर्धारित CPCB सीमा किसी भी स्टेशन पर पार नहीं की गई है।
शोर का स्तर	निगरानी कार्यक्रम के परिणामों ने संकेत दिया कि निगरानी किए गए सभी 15 स्थानों पर शोर के दिन और रात दोनों समय एनएएक्यूएस की निर्धारित सीमा के भीतर थे।
पानी की गुणवत्ता	सभी स्रोतों से भूजल पीने के उद्देश्यों के लिए उपयुक्त रहता है क्योंकि सभी घटक IS: 10500 द्वारा प्रख्यापित पेयजल मानकों द्वारा निर्धारित सीमा के भीतर हैं।
मिट्टी की गुणवत्ता	चिन्निहित किए गए स्थानों से एकत्र किए गए नमूने इंगित करते हैं कि मिट्टी रेतीली प्रकार की है और पीएच मान 7.39 से 8.37 के बीच है, जो दर्शाता है कि मिट्टी प्रकृति में थोड़ी क्षारीय है।
पारिस्थितिकी और जैव विविधता	अध्ययन क्षेत्र में कोई पर्यावरण-संवेदनशील क्षेत्र नहीं है।
सामाजिक आर्थिक	नदी तल पर बालू खनन परियोजना के कार्यान्वयन से स्थानीय लोगों को प्रत्यक्ष और अप्रत्यक्ष दोनों तरह के रोजगार के अवसर मिलेंगे। अध्ययन क्षेत्र में शिक्षा, स्वास्थ्य, आवास, पानी, बिजली आदि को और बेहतर किया जा सकता है। उम्मीद है कि प्रस्तावित खनन परियोजना और संबद्ध औद्योगिक और व्यावसायिक गतिविधियों के कारण इसमें काफी हद तक और सुधार होगा।

❖ अनुमानित पर्यावरणीय प्रभाव

- **वायु पर्यावरण पर प्रभाव**

प्रस्तावित खनन गतिविधियां खनन में प्रयुक्त अन्य परिवहन वाहनों की लोडिंग और आवाजाही से धूल (SPM/RSPM) उत्पन्न होगी। खदान स्थल पर उचित जल छिड़काव किया जाएगा। हवा से होने वाले क्षणिक उत्सर्जन को कम करने के लिए खनिज को ढके हुए तिरपाल ट्रकों/टिप्परों के माध्यम से सड़क मार्ग से ले जाया जाएगा।

- **जल पर्यावरण पर प्रभाव**

नदी के भीतर या उसके पास से बालू के खनन का मानसून के मौसम के दौरान भौतिक-रासायनिक आवास विशेषताओं पर अप्रत्यक्ष प्रभाव पड़ता है। इन विशेषताओं में धारा खुरदरापन, तत्व, गहराई, वेग, मैलापन, तलछट परिवहन और धारा निर्वहन शामिल हैं।

संस्तर सामग्री खनन से उत्पन्न बायोटा पर हानिकारक प्रभाव, यदि कोई हो, निम्नलिखित के कारण होते हैं:

- नदी के परिवर्तन के परिणामस्वरूप प्रवाह पैटर्न में बदलाव
- मानसून के मौसम में निलम्बित तलछट की अधिकता।

परियोजना गतिविधि केवल सोन नदी के शुष्क भाग में की जाएगी। इसलिए, परियोजना की कोई भी गतिविधि सीधे तौर पर जल पर्यावरण को प्रभावित नहीं करती है। परियोजना में केवल मानसून के मौसम में किसी धारा को मोड़ने या काट देने का प्रस्ताव नहीं है। नदी (मानसून में) या भूजल दोहन से पानी की पंपिंग 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 बेड और बैंकों के क्षरण, चैनल ढलान में वृद्धि, और चैनल आकारिकी में परिवर्तन जैसे कई प्रभाव हो सकते हैं, यदि, संचालन व्यवस्थित रूप से नहीं किया जाता है।

बालू के व्यवस्थित और वैज्ञानिक तरीके से हटाने से क्यारियों का क्षरण नहीं होगा। कचरे के रूप में उत्पन्न गाद और मिट्टी का उपयोग वृक्षारोपण के लिए या निचले इलाकों को कहीं और भरने के लिए किया जाएगा। खनन की योजना गैर-मानसून मौसम में ही बनाई जाती है, ताकि उत्खनित क्षेत्र प्रत्येक वर्ष मानसून के दौरान धीरे-धीरे भर जाए।

❖ शोर पर्यावरण पर प्रभाव

प्रस्तावित खनन गतिविधि प्रकृति में अर्ध-मशीनीकृत है। खनन गतिविधि के लिए कोई ड्रिलिंग और ब्लास्टिंग परिकल्पित नहीं है। इसलिए, केवल खनिजों के परिवहन के लिए तैनात वाहनों की आवाजाही के कारण प्रभाव का अनुमान लगाया गया है। वाहनों को अच्छी चालू स्थिति में रखा जाएगा ताकि शोर को न्यूनतम संभव स्तर तक कम किया जा सके।

❖ जैविक पर्यावरण पर प्रभाव

चूंकि प्रस्तावित खनन वैज्ञानिक तरीके से किया जाएगा, इसलिए ज्यादा महत्वपूर्ण प्रभाव का अनुमान नहीं है। जलीय जीवन पर प्रभाव को कम करने के लिए मानसून के मौसम के दौरान कोई खनन नहीं किया जाएगा जो कि कई प्रजातियों के लिए मुख्य रूप से प्रजनन का मौसम है। खनन स्थल पर कोई वनस्पति नहीं है; वनस्पति की सफाई नहीं की जाएगी। ढोने वाली सड़कों पर पानी का छिड़काव किया जाएगा जिससे धूल का उत्सर्जन कम होगा और इस प्रकार फसलों को होने वाले नुकसान से बचा जा सकेगा।

❖ सामाजिक आर्थिक पर्यावरण पर प्रभाव

क्षेत्र में खनन गतिविधि का प्रभाव क्षेत्र के सामाजिक-आर्थिक वातावरण पर सकारात्मक है। बालू खनन से स्थानीय लोगों को जब भी श्रमबल की आवश्यकता होगी रोजगार उपलब्ध होगा।

पोस्ट प्रोजेक्ट पर्यावरण निगरानी

क्रम संख्या	पैरामीटर्स का विवरण	निगरानी की अनुसूची
1	हवा की गुणवत्ता	मानसून को छोड़कर प्रत्येक मौसम में सप्ताह में दो बार/तीन बार 24 घंटे के नमूने
2	जल गुणवत्ता (सतह और भूजल)	साल में 4 सीजन के लिए एक बार

3	मिट्टी की गुणवत्ता	परियोजना क्षेत्र में वर्ष में एक बार
4	शोर 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 निगरानी	एक बार एक मौसम में

❖ अतिरिक्त अध्ययन

- **सार्वजनिक सुनवाई**

जन सुनवाई अभी बाकी है।

❖ जोखिम आकलन

पूर्ण खनन कार्य एक योग्य खदान प्रबंधक होल्डिंग के प्रबंधन नियंत्रण और निर्देशन में किया जाएगा। डीजीएमएस 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 आपातकालीन तैयारी एक महत्वपूर्ण पहलू है। कार्मिकों को उचित रूप से प्रशिक्षित किया जाएगा और सावधानीपूर्वक नियोजित, सिम्युलेटेड प्रक्रियाओं के माध्यम से आपातकालीन प्रतिक्रिया में मानसिक और शारीरिक रूप से तैयार किया जाएगा। इसी तरह, प्रमुख कर्मियों और आवश्यक कर्मियों को संचालन में प्रशिक्षित किया जाएगा।

❖ परियोजना लाभ

- **भौतिक लाभ**: सड़क परिवहन, बाजार, हरित आवरण में वृद्धि और सामुदायिक संपत्तियों का निर्माण।
- **सामाजिक लाभ**: रोजगार क्षमता में वृद्धि, राजकोष में योगदान, स्वास्थ्य संबंधी गतिविधियों में वृद्धि, शैक्षिक उपलब्धियां और मौजूदा सामुदायिक सुविधाओं का सुदृढ़ीकरण।

❖ पर्यावरणीय लाभ:

❖ नदी चैनल को नियंत्रित करना और बैंकों की सुरक्षा करना।

❖ बाढ़ के कारण आसपास की कृषि भूमि के डूबने को कम करना।

- ❖ नदी के स्तर के उन्नयन को कम करना।
- ❖ अवैध खनन गतिविधि पर एक जांच।

- ❖ **कॉर्पोरेट की सामाजिक जिम्मेदारी**

दिनांक 1 मई 2018 के कार्यालय ज्ञापन के अनुसार परियोजना लागत की पूंजीगत लागत का 2% कॉर्पोरेट पर्यावरणीय उत्तरदायित्व के लिए आवंटित किया जाएगा। लोगों की जरूरतों और मांग को ध्यान में रखते हुए निम्नलिखित प्रस्तावित किया गया है।

किशनगंज यूनिट 05 बालू घाट के लिए सीईआर (CER) लागत कुल परियोजना लागत का 2% होगी। इस राशि का उपयोग समाज कल्याण के लिए किया जाएगा। सीएसआर (CSR) लागत रु. 4,97,45,000/- x 2% = रु. 9,94,900/-

प्रत्येक गतिविधि के लिए प्रस्तावक द्वारा निर्धारित की जाने वाली धनराशि का निर्धारण जन सुनवाई के दौरान स्थानीय प्राधिकारी/लोगों एवं हितग्राहियों से चर्चा के बाद किया जायेगा। सीईआर कार्यक्रम के तहत की जाने वाली गतिविधियों का समवर्ती मूल्यांकन करने की योजना बनाई गई है।

❖ वृक्षारोपण:

- परियोजना से कोई पेड़ नहीं कटेगा। तथापि, असामाजिक उत्तरदायित्व, सड़क के दोनों ओर और नदी के किनारे हरियाली विकसित की जाएगी। इन वृक्षारोपण को बढ़ाने के लिए सामुदायिक सेवाओं को तैनात किया जाएगा। आर्थिक महत्व के पेड़ और देशी मूल के पेड़ जैसे फलों के पेड़ लगाए जाएंगे।
- योजना अवधि में हॉल रोड के आसपास लगभग 910 पौधे रोपे जाएंगे।
- वृक्षारोपण के लिए प्रस्तावित पेड़ हैं:
- सस्टेनेबल सैंड मैनेजमेंट एंड माइनिंग गाइडलाइंस 2016 के अनुसार ग्रीनबेल्ट के विकास के लिए प्रति हेक्टेयर न्यूनतम 5 पौधे प्रस्तावित किए जाएंगे लेकिन पर्यावरण की बेहतर स्थिति के लिए परियोजनाओं के इस समूह में 10 पौधे प्रति हेक्टेयर प्रस्तावित किए जाएंगे।
- पीपल, अर्जुन, जामुन, बरगद, नीम, आम आदि के पेड़ लगाए जाएंगे।

पर्यावरण प्रबंधन योजना (ईएमपी)

- रिवर बैंक से सुरक्षा क्षेत्र छोड़कर नदी तल से निकासी की जाएगी।
- अधिकतम काम करने की गहराई क्षेत्र के भूजल तालिका के ऊपर रहेगी।
- स्वास्थ्य प्रभावों को कम करने के लिए प्रभाव क्षेत्र में श्रमिकों और आसपास के लोगों को स्वास्थ्य सुविधाएं प्रदान किया जायेगा ।
- वन्यजीव संरक्षण सुनिश्चित करना और उसी के लिए जागरूकता अभियान की व्यवस्था किया जायेगा।
- नदी में महीन तलछट छोड़ने वाली गतिविधियों को किया जायेगा।
- खनिजों के परिवहन और प्रबंधन के दौरान गड़बड़ी को कम करने के लिए प्रभावी शमन उपाय अपनाए जाएंगे
- स्थानीय/देशी और तेजी से बढ़ने वाली प्रजातियों के वृक्षारोपण के साथ सुधार कार्यक्रम की स्थापना किया जायेगा
- मानसून के मौसम की शुरुआत में खान के बंद होने के दौरान बहाली योजना की स्थापना किया जायेगा
- आसन्न आपदाओं के प्रभाव से बचने के लिए समय पर एहतियाती उपाय करने के लिए प्रभावी आपदा प्रबंधन योजना की स्थापना।
- पर्यावरण प्रबंधन प्रकोष्ठ द्वारा प्रभावी निगरानी कार्यक्रम की स्थापना किया जायेगा।

❖ **ईएमपी कार्यान्वयन के लिए बजट आवंटन**

टेबल, ईएमपी का बजट (किशनगंज यूनिट 05)

क्रम संख्या	**विवरण**	**पूंजी लागत (लाख)**	**आवर्ती लागत (लाख)**
1	प्रदूषण नियंत्रण और धूल दमन	**Nil**	**1.5**
2	प्रदूषण निगरानी i) वायु प्रदूषण ii) मृदा प्रदूषण iii) जल प्रदूषण	--	2.0

	iv) ध्वनि प्रदूषण		
3	वृक्षारोपण और वेतन एक माली के लिए (अंशकालिक आधार पर)	9.10	0.5
4	परिवहन सड़क रखरखाव लागत	17.325	1.5
कुल		**26.425**	**5.5**

नोट: *910 पौधे * 1000 रुपये (हेज और बाड़ सहित प्रत्येक पौधे के लिए) = 9,10,000/- रुपये

- खनन परिवहन सड़क रखरखाव के लिए श्रम का वेतन 2 श्रमिक*300=600 प्रति दिन
- 600* 250= 1,50,000/-
- *2.5 लाख प्रति किलोमीटर (2,50,000*6.93 किमी लंबी सड़क) = 17,32,500/-

निष्कर्ष

ईआईए अध्ययन के आधार पर यह देखा गया है कि धूल प्रदूषण में वृद्धि होगी, जिसे पानी के छिड़काव और वृक्षारोपण द्वारा नियंत्रित किया जाएगा। खनन गतिविधियों के कारण (एम्बिएंट) परिवेशी पर्यावरण और पारिस्थितिकी पर नगण्य प्रभाव पड़ेगा, इसके अलावा खनन संचालन से क्षेत्र में प्रत्यक्ष और अप्रत्यक्ष रोजगार सृजन होगा। क्षेत्र के चारों ओर हरित पट्टी का विकास एक प्रभावी प्रदूषण न्यूनीकरण तकनीक के साथ-साथ खान परिसर से निकलने वाले प्रदूषकों को नियंत्रित करने के लिए भी किया जाएगा। खनन कार्य जारी रहने तक निगरानी कार्यक्रम का पालन किया जाएगा। इसलिए, यह संक्षेप में कहा जा सकता है कि खान के विकास से क्षेत्र के सामाजिक-आर्थिक वातावरण पर सकारात्मक प्रभाव पड़ेगा और क्षेत्र के सतत विकास को बढ़ावा मिलेगा।

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