DRAFT ENVIRONMENTAL IMPACT ASSESSMENT

AND

ENVIRONMENTAL MANAGEMENT PLAN OF

CLUSTER SAND MINING PROJECT, BLOCK NO 9 SAND GHAT, DISTRICT – LAKHISARAI

SAND BLOCK	**BLOCK 9**
PROPOSAL NO	**SIA/BR/MIN/415660/2023**
ToR No	**SIA/1(A)/2281/2023**
AREA	**12.7 HA**
PRODUCTION	**76200 cum/year or 157734 TPA.**
LOCATION	**MAUZA– NONGARH, CHANAN DIST - LAKHISARAI (BIHAR).**
KHATA No	**295**
KHASRA No	**555**

APPLICANT

Sanjay Kumar
S/o Ramashray Singh
Add.- New Court Area Naya Bazar, Lakhisarai.

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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

2.0 TYPE OF PROJECT

The project is proposed by Sanjay Kumar; Mauza- Nongarh, Chanan, Dist-Lakhisarai (Bihar). Proposed Area of the Project is 12.7 ha & proposed production of Sand is 76200 cum/year or 157734 TPA.

The project is proposed is proposed for excavation of sand from the bed of river Kiul at block no-9. The proposed project is opencast semi-mechanized/OTFM mining project.

The project is proposed is for sand block no-09, sand for the excavation of sand from the bed of river Kiul. The proposed project is opencast semi-mechanized/OTFM mining project.

2.1 NEED FOR THE PROJECT

The project site lies on Kiul 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 was located on Kiul River at Block No – 09, Sand Ghat at Mauza- Nongarh, Chanan, Dist-Lakhisarai (Bihar).

The proposed mining was a cluster of 06 mining lease area of block 7,8,9,10,11 & 12 cluster over an combined area of 141.8 Ha is for river bed sand mining on Kiul River at Sand Ghat at Mauza- Nagardar, Nongarh, Rampur, Batta, Dist-Lakhisarai (Bihar).

Cluster Situation: As per District Survey Report Lakhisarai (Page no 53) the Proposed sand Ghats of block 07, block 8, block 9, block 10, block 11 & block 12 are comes in cluster situation whose combined cluster area is 141.8 ha. All the lease area of homogeneous minerals is coming within 500 m radius from each other confirming a cluster situation.

Block 9 are applied for Environmental Clearance in this EIA Report.

Sand Block Name	Area (Ha)	Khata	Khasra No.	Production (TPA)	Address
Block 7	24.6	89	01, 15, 366	305532	Eklavya Stone And Mines Pvt. Ltd. Director – Nidhi Kumari W/o – Eklavya Kumar or Kumari Priti W/o – Shree Akhilesh Kumar, Village – Pathra English, Post- Orhanpur, P.S. Muffassil, District- Nawada (Bihar).
Block 8	33.2			412344	--
Block 9	12.7	295	555	157734	Sanjay Kumar S/o Ramashray Singh Add.- New Court Area Naya Bazar, Lakhisarai.
Block 10	39.3	295, 296	555, 2316	488106	Amit Singh S/o – Late Niwas Singh Village – Paharpur, Post – Dariyapur, P.S – Barahiya, Dist – Lakhisarai (Bihar)
Block 11	18.4	65, 188	01, 555, 1226	228528	Gopal Kumar, S/o - Kedar Prasad Sharma Address : Valipur, Pipariya, Lakhisarai (Bihar).
Block 12	13.6			168912	
TOTAL	**141.8**			1761156 TPA	

Geo Coordinate of Lease Area:

Table 2.1, Mine lease Pillar Co-ordinates (Block 09)

Pillar No	Latitude (N)	Longitude (E)
A	25° 3'48.24"N	86° 9'8.22"E
B	25° 3'30.13"N	86° 9'12.62"E
C	25° 3'33.26"N	86° 9'4.89"E
D	25° 3'39.76"N	86° 8'59.42"E
E	25° 3'46.63"N	86° 8'59.32"E

Block 09 Sand Ghat is well connected by SH-18. SH 18 is approximatly 1.40 km in SW direction.

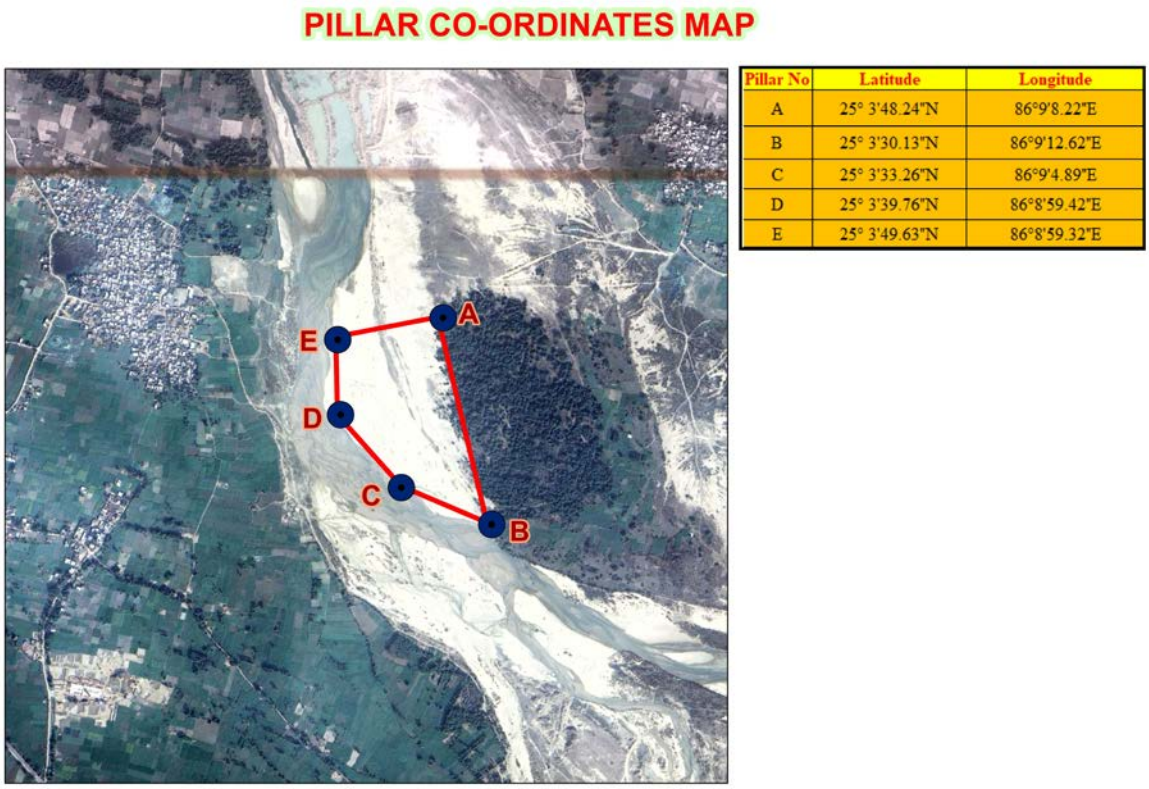

Figure 2.1:- Pillar Coordinate map of block 09

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.

Block	Area	Khata No	Khasra No	Production	Auction Cost
Block 09	12.7	295	555	157734 TPA	12,11,58,000
Total				157734 TPA	12,11,58,000

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.

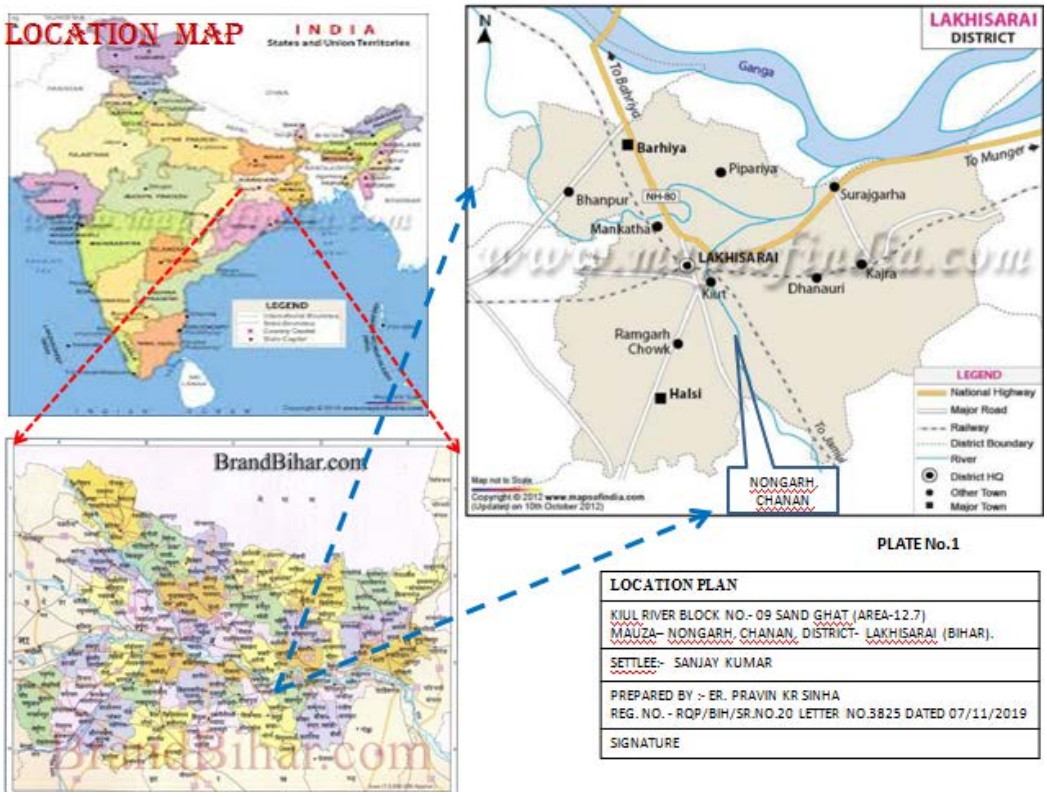

Figure 2.2:- Location map of the project site Block 9

2.3 TOPOGRAPHY & GEOLOGY

2.3.1 Topography

The area represents a rough and rugged topography. A detailed geological map on 1:1000 scales with contour interval. The area shows a general slope toward N-E while the highest RL of 47.2 m occurring on the South –East side of the area along boundary pillar, whereas the lowest RL of 40.7 m within the lease area is found along N-E slope near boundary line.

2.3.2 GEOMORPHOLOGY

The district has a diverse landscape ranging from hills to flood plains. The major geomorphic units are rocky upland, pediplain, alluvial plain and flood plains.

a) The Rocky Upland area comprises series of Kachhua and Kajra hills. These hill tracts constitute elevated and rugged landmasses surrounded by alluvial plains. The altitude of hills varies from 250 to 500m amsl. It comprises mainly quartzite, phyllite and schist of Kharagpur formation. The rocks of Kharagpur formation have undergone tectonic deformation giving rise to variety of deformational structures. The rocky uplands are limited mainly in Surajgarha block.

b) Pediplain is represented by an area formed through coalescence of pediments and thus forms rolling topography and comprises residual soil overlain by mixture of sheet wash deposits. It extends all along the Kharagpur hills.

c) Older Alluvial Plain forms a major part of the district. It comprises sediments deposited by Ganga river and also the sediments derived from the denudation of Chota Nagpur plateau and Kharagpur hills. This is also known as marginal alluvial plain due to its limited thickness. Although the thickness 8 of this alluvium at Ashok dham village is about 123m but reduces considerably in the southeastern parts ranging from 15 to 20m.

d) Younger Alluvial Plain forms the northern parts of the district and stretches few km to the south of Ganga rive. Almost all of Pipariya and some part of Barahiya blocks are considered as flood prone area. These areas remain inundated in rainy season. Locally, this is called “Tal” area. Diara area is level to gently undulating ground. The mighty Ganga meanders in this parts and usually remains flooded from middle of July to the end of September. The relief of this plain varies on an average from 25 to 65m above mean sea level.

Source: http://cgwb.gov.in/District_Profile/Bihar/lakhisrai.pdf

2.3.3 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 Occurrences 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

Source: Mining Plan

2.3.4 LOCAL GEOLOGY OF THE AREA

Kiul River is a tributary of Ganges. It originates in Giridih of Jharkhand and flows through Lakhisarai, Sheikhpura and Jamui districts of the Indian state of Bihar and joins Harohar river in the Diara region. Kiul originates from the Tisri Hill Range in Kharagdiha police station area of Giridih district. After forming the boundary of the district for a short distance it enters Jamui district through a narrow gorge near the Satpahari hill. It first flows in an easterly direction close to the southern base of the Girdheswari Hills. It turns northward at their eastern extremity and passes near the town of Jamui. Two miles south of Jamui it is joined by Barnar, below this point it receives the Alai, a mountain stream and near Jamui railway station it is joined by the Anjan. It then flows north-east up to Lakhisarai, It passes below the railway bridge between Kiul junction and Lakhisari station and is joined a few miles north of that place, near Rahuaghat, by the Harohar (Halahar or Harhobar), a

continuation of the Sakri River. After this it turns due east and falls into the Ganges near Surajgarha. Until it meets the Harohar the Kiul has broad sandy bed and in some places is as much as half a mile wide, though it contains very little water in summer.

The litho units encountered in the riverbed and surrounding areas belongs to the Shivalik super groups. The size of the sediments towards the source i.e. host rock is course and at the tale end of the river the grain size is reduced to smaller sizes resulted in the formation of clay beds.

Source: http://cgwb.gov.in/District_Profile/Bihar/lakhisrai.pdf

2.3.5 CLIMATE

The climate of the district is somewhat extreme in nature, i.e., quite hot during the summer and fairly cold during the winter. January is the coldest month when the mean minimum temperature comes down to approximately 4o C. The temperature starts rising from March and reaches its peak in May when the mercury touches about 45oC. The average annual rainfall of the district is 1170 mm and about 85% of the rainfall is by South-west monsoon during June to September

Source https://cgwb.gov.in/District_Profile/Bihar/lakhisrai.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.

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 Block 9

Classification	Code	Quantity of Sand
A) **Mineral Reserves**	----	Cum
1) **Proved Mineral Reserves**	111	127000
Total		127000

Source Mining Plan

2.4.1 Mineable Reserves:

Mineable reserves have been computed up to 1m depth from surface. The volume multiplied by bulk density (2.07 g/cm3) to get the tonnage.

The minerals excavated from the river bed will be replenished gradually during the monsoon season every year. And the area pertaining to palaeo channels of the river will be leveled & restored back..

Table-2.4:- Summary of minable reserves of Lakhisarai Kiul 09 Sand Ghat as below (the bulk density multiply by 2.07)

Table 2.4 Block 09

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
55-54	494	235	1	116090	240307
Total				116090	240307

Total Mineable Reserve = 116090 CUM or 240307 Tonnes

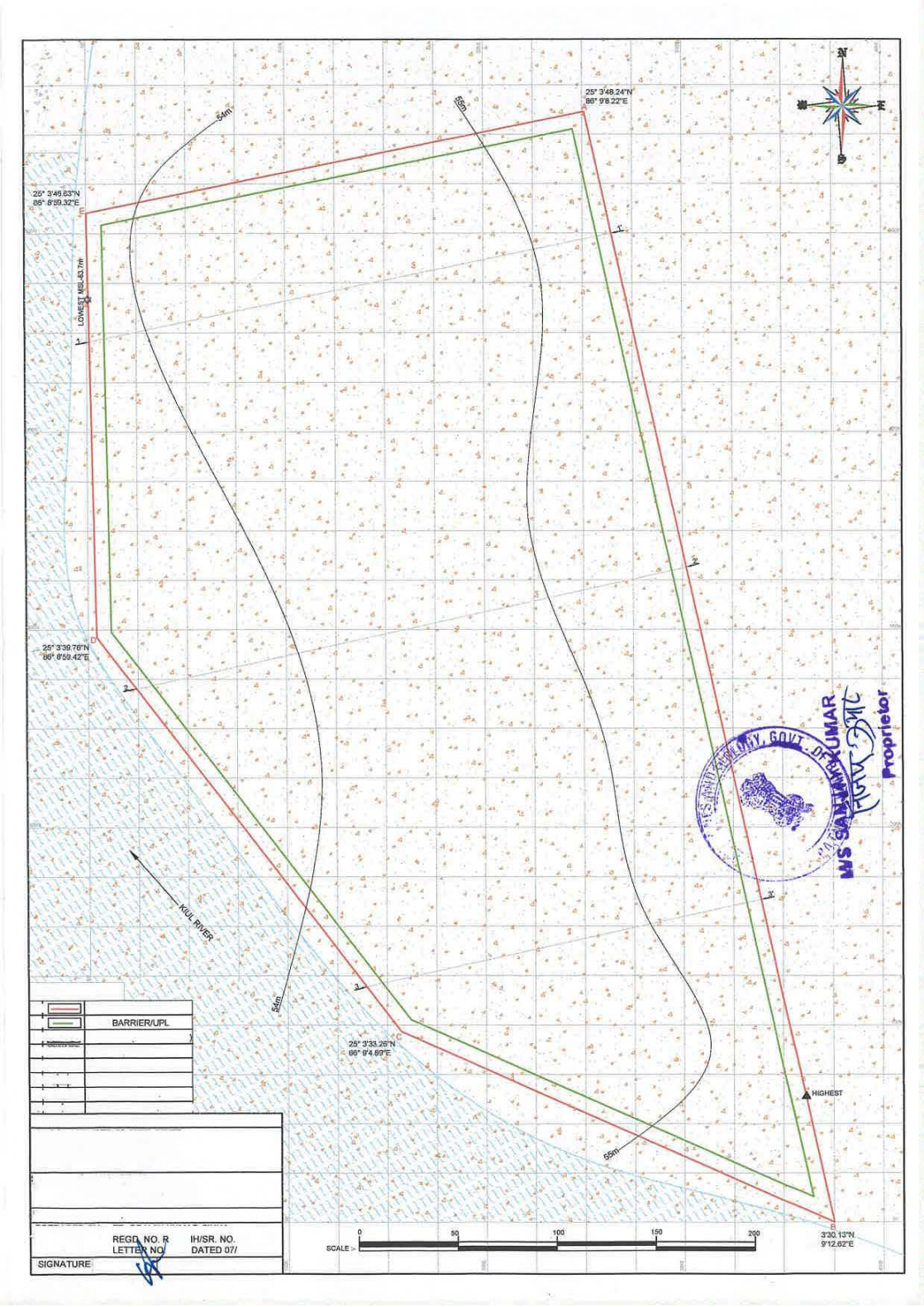

Figure 2.3:- Surface cum Geological Section of Block 09

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.

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 Lakhisarai Block 09,are given below :-

Table 25: Year wise Production Details of Sand Ghat 09

YEAR	ROM sand (cum)	ROM sand (Tones)
1st Year	76200	157734
2nd Year	76200	157734
3rd Year	76200	157734
4th Year	76200	157734
5th Year	76200	157734
Total	**381000**	**788670**

Source: Mining Plan

2.5 Conceptual Mining Plan

Mine Applied Area will be worked for Lakhisarai Block – 09 Sand Ghat. However, as the digging depth will be restricted to 1.0 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: River bank side will be protected by working in dry part of the river and by leaving safety distance of the width from the river bank 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 Sand 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.

2.6.0 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 top soil is present in the mining area as it is riverbed. Small amount of domestic waste will be generated by the workers at the site, which will be disposed off through proper municipal way. No other waste generation is expected. No waste will be thrown into the streams or left on the banks. Separate bins will be kept within the lease area for domestic wastes.

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 Kiul River so there will be no impact on surface water.

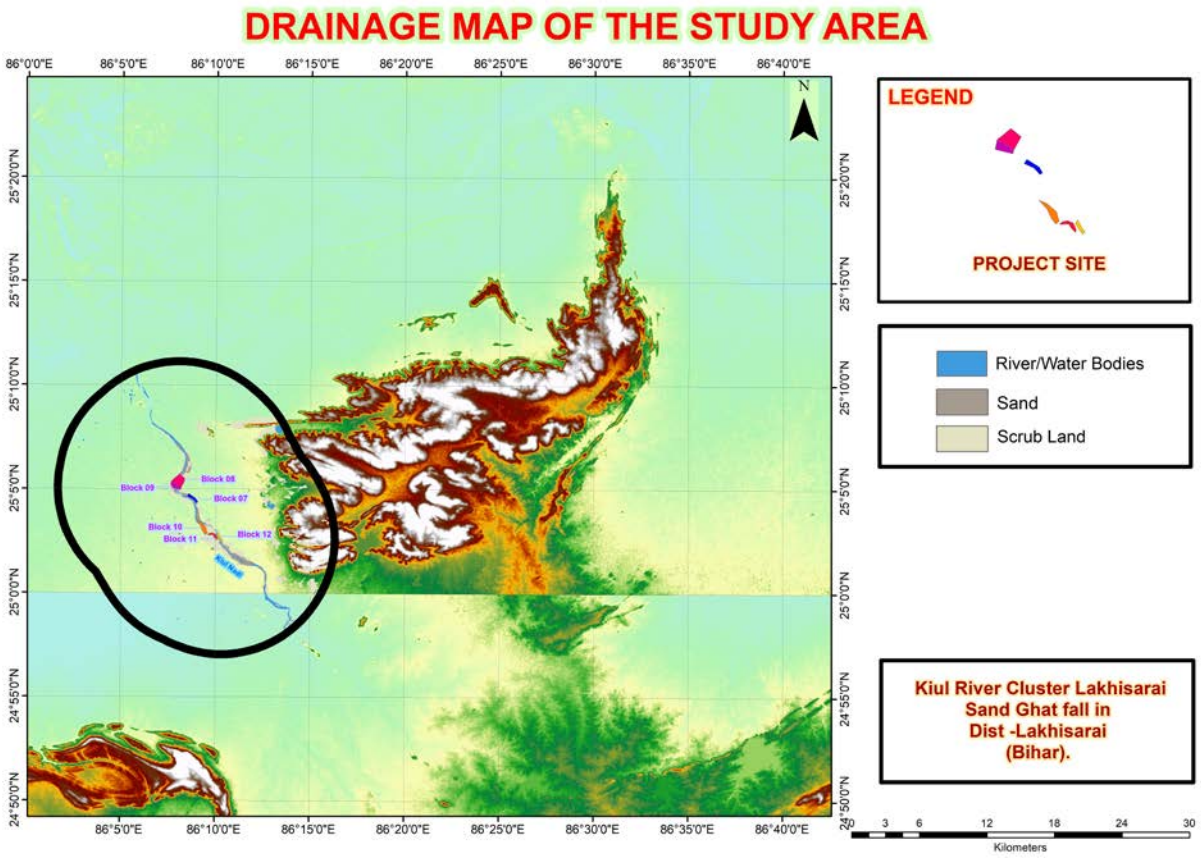

Fig-2.5, Drainage map

2.7.3 Man power requirement

The manpower requirement for the proposed project will be around 20 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 2.6.**

Table 2.6 Manpower Requirement in Block 09

S. No.	Category	Numbers
1.	Administration	01
2.	Supervisor	01
3.	Skilled	03
4.	Un-skilled	15
TOTAL		20

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 2.7 BLOCK 09

Activity	Calculation	Round off Figure in KLD
Drinking	@ 10 lpcd per labor 10*20/1000= 0.20 KLD	0.20
Dust Suppression	**Total approach road to be water sprinkled** = 2100 m 2100 m*6m*0.5 *2 times/1000= 12.60 KLD	12.6
Plantation	127 plant (during plan period) @ 5 L/per plant= 127*5lts= 635/1000= 0.65KLD	0.65
Total		**13.45~13.50 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.

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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.

As per District Survey Report Lakhisarai (Page no 53) the Proposed sand Ghats of block 7, block 8, block 9, block 10, block 11 & block 12 are comes in cluster situation . All the lease area of homogeneous minerals is coming within 500 m radius from each other confirming a cluster situation.The baseline environment quality was carried out over a radial distance of 10 km around the cluster of mining lease area during the months of Dec 2022, Jan-Feb 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 (Dec 2022, Jan-Feb 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)	Area (%)
Scrub Land	2781.61	5.84
Forest	6223.89	13.07
River/Water Bodies	1847.51	3.88
Settlement	3689.08	7.75
Vegetation	353.34	0.74
Sand	328.58	0.69
Agriculture	32377.63	68.02
AREA	**47601.64**	**100.00**

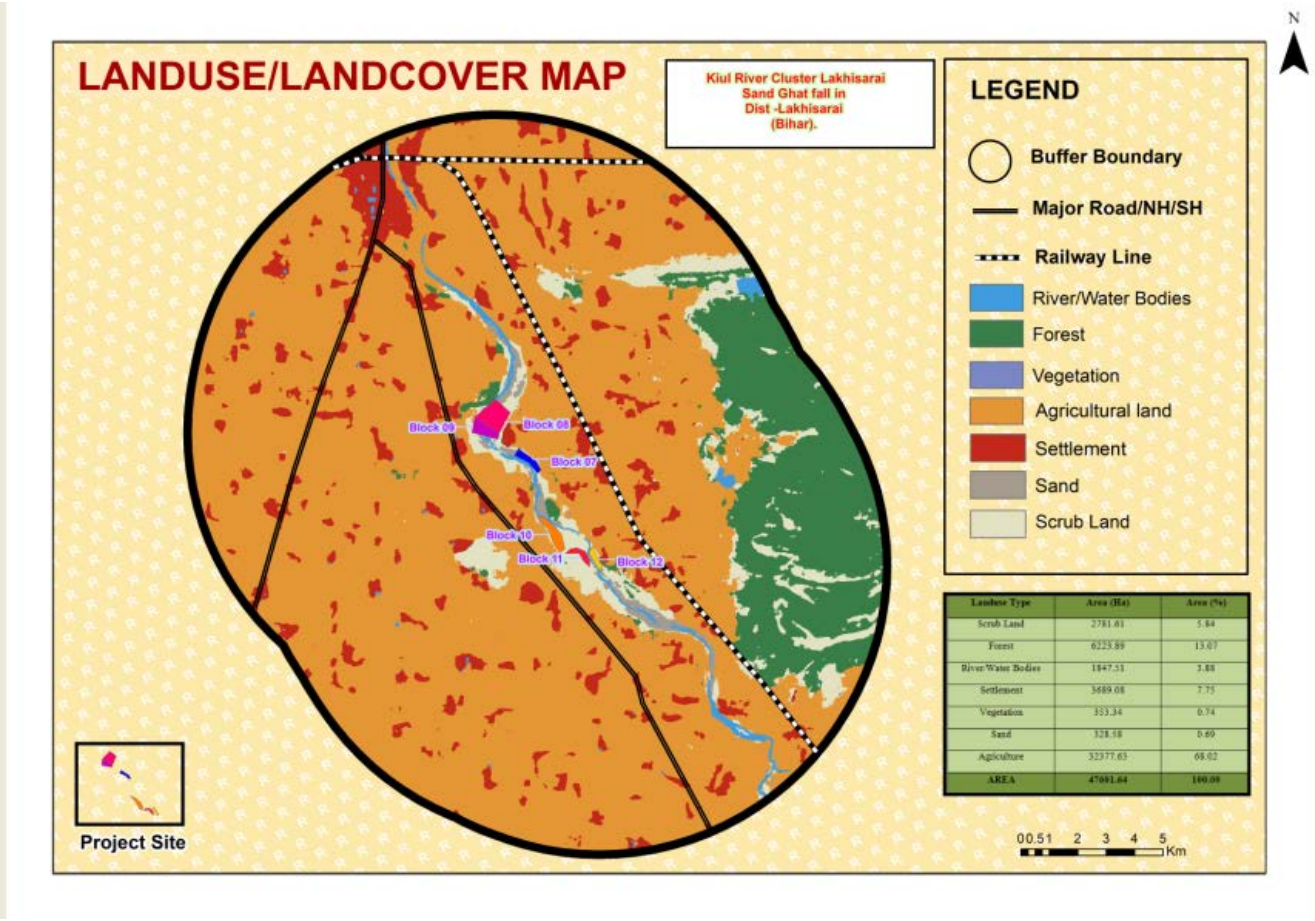

FIGURE 3.1: LAND USE COVER OF THE PROJECT STUDY AREA

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 Dec 2022 to February 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: Water sampling locations

SITE	Location	Distance, direction
Ground water		
GW1	Bhalui village	0.24 Km, East
GW2	Mananpur	5.05 Km, East
GW3	Mahuliya	3.46 Km, East
GW4	Gopalpur	3.09km, SE
GW5	Shahnagar	7.25 Km, NW
GW6	Sadhmaf	7.00 Km, SW

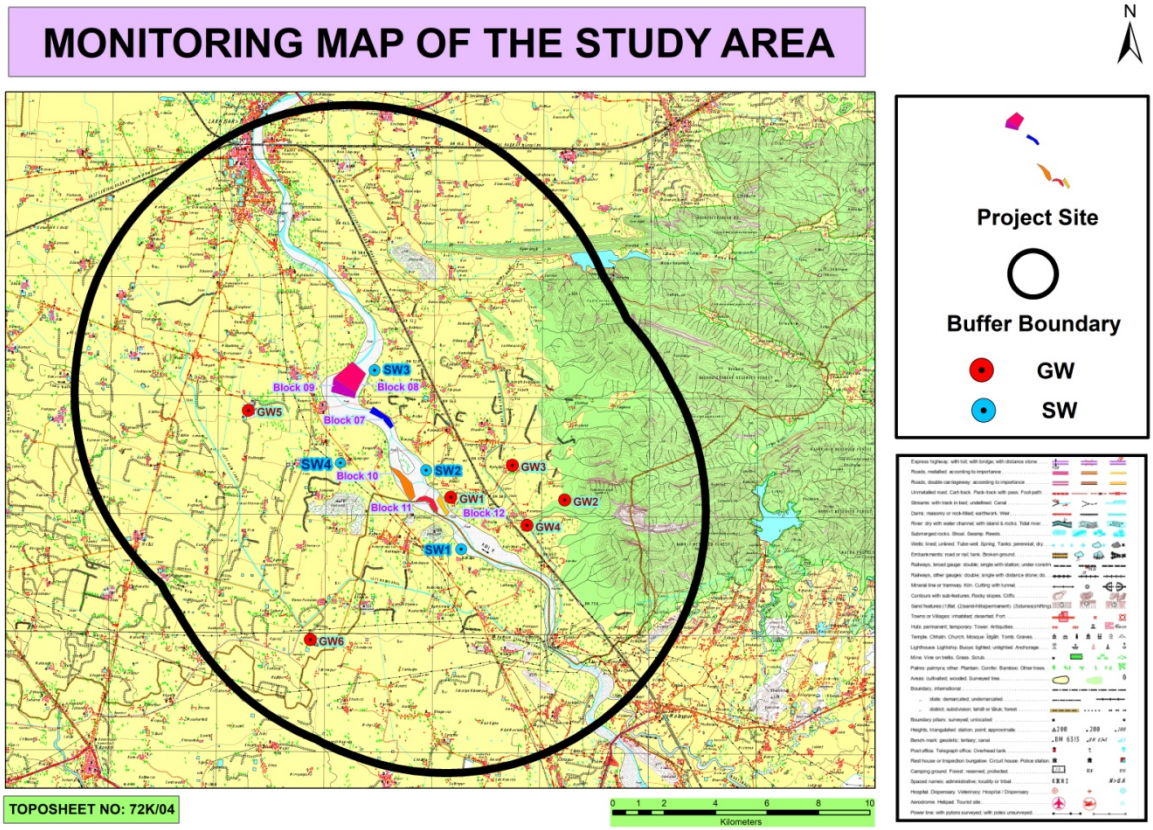

Figure 3.2 Water Sampling Location Map

Table 3.3 Ground Water Quality Monitoring Result

S. No.	Parameter	Unit	Limit (as per IS:10500)		GW1	GW2	GW3
			Desirable	Permissible			
1	Colour	Hazen	5	25	<2	<2	<2
2	Odour	-	Un	-	Un	Un	Un
3	Taste	-	Agreeable	-	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	5	10	1	<1	<1
5	pH	-	6.5-8.5	No Relaxation	7.31	7.64	7.55
6	Total Hardness (as CaCO3)	mg/l	300	600	325	403	355
7	Iron (as Fe)	mg/l	0.3	1	0.13	0.08	0.05
8	Chlorides (as Cl)	mg/l	250	1000	46	35	33
9	Fluoride (as F)	mg/l	1	1.5	0.6	0.7	0.6
10	TDS	mg/l	500	2000	385	335	325
11	Calcium(as Ca2+)	mg/l	75	200	55	42	38

12	Magnesium (as Mg2+)	mg/l	30	100	21	17	16
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	<0.01	<0.01
14	Manganese(as Mn)	mg/l	0.1	0.3	0.04	0.02	0.02
15	Sulphate (as SO4)	mg/l	200	400	25	15	14
16	Nitrate(as NO3)	mg/l	45	No Relaxation	3	4	4
17	Phenolic Compounds (as C6H5OH)	mg/l	0.001	0.002	<0.001	<0.001	<0.001
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01
20	Arsenic (as As)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01
21	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01
22	Lead (as Pb)	mg/l	0.05	No Relaxation	0.02	<0.01	<0.01
23	Zinc (as Zn)	mg/l	5	15	0.14	0.11	0.09
24	Chromium (as Cr6+)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01
25	Mineral oil	mg/l	0.01	0.03	<0.01	<0.01	<0.01
26	Alkalinity as CaCO3	mg/l	200	600	255	347	230
27	Aluminium (as Al)	mg/l	0.03	0.2	<0.02	<0.02	<0.02
28	Boron (as B)	mg/l	1	5	0.1	0.2	0.1
	Microbiological Parameter						
29	Total Coliform	MPN /100ml	10 , Max	-	<2	<2	<2
30	E.coli	E.coli /100ml	Absent	-	Absent	Absent	Absent

Ground Water Quality Monitoring Result

S. No.	Parameter	Unit	Limit (as per IS:10500)	GW4	GW5	GW6

			Desirable	Permissible			
1	Colour	Hazen	5	25	<5	<5	<5
2	Odour	-	Un	-	Unobjectionable	Unobjectionable	Unobjectionable
3	Taste	-	Agreeable	-	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	5	10	<1	<1	<1
5	pH	-	6.5-8.5	No Relaxation	7.63	7.55	7.62
6	Total Hardness (as CaCO3)	mg/l	300	600	364	340	382
7	Iron (as Fe)	mg/l	0.3	1	0.03	0.04	0.03
8	Chlorides (as Cl)	mg/l	250	1000	38	42	34
9	Fluoride (as F)	mg/l	1	1.5	0.74	0.76	0.82
10	TDS	mg/l	500	2000	579	503	558
11	Calcium(as Ca)	mg/l	75	200	94.4	88.8	99.2
12	Magnesium (as Mg)	mg/l	30	100	31.1	28.6	32.5
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	<0.01	<0.01
14	Manganese(as Mn)	mg/l	0.1	0.3	0.02	0.01	0.02
15	Sulphate (as SO4)	mg/l	200	400	24	26	30
16	Nitrate(as NO3)	mg/l	45	No Relaxation	8.3	6.9	8.7
17	Phenolic Compounds (as C6H5OH)	mg/l	0.001	0.002	<0.001	<0.001	<0.001
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01
21	Arsenic (as As)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01
22	Cyanide (as CN)	mg/l	0.05	No Relaxati	<0.01	<0.01	<0.01

				on			
23	Lead (as Pb)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01
24	Zinc (as Zn)	mg/l	5	15	0.02	0.01	0.02
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	<0.01	<0.01
26	Chromium (as Cr6+)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01
27	Mineral oil	mg/l	0.01	0.03	<0.01	<0.01	<0.01
28	Alkalinity as CaCO3	mg/l	200	600	306	312	308
29	Aluminium (as Al)	mg/l	0.03	0.2	<0.02	<0.02	<0.02
30	Boron (as B)	mg/l	1	5	<0.1	<0.1	<0.1
	Microbiological Parameter						
31	Total Coliform	MPN /100ml	10 , Max	-	<2	<2	<2
32	*E. coli*	E.coli /100ml	Absent	-	Absent	Absent	Absent

Observation:

Analysis of results of ground water reveals the following: -

- pH varies from 7.31 at to 7.64.

  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

SITE	Location	Distance, direction
Ground water		
SW1	Upstream	0.5Km, SW

SW2	Project Site	-
SW3	Downstream	0.5Km, N
SW4	Gunsagar Talab	3.32 Km, NW

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
1	pH	-	7.48	7.74	7.63	8.64
2	Dissolved oxygen	mg/l	7.7	7.5	7.4	7.5
3	BOD (3 Days at 27°C)	mg/l	2	2	3	2
4	Free Ammonia (as N)	mg/l	<0.1	<0.1	<0.1	<0.1
5	Sodium Adsorption Ratio	-	0.73	0.64	0.85	0.70
6	Boron	mg/l	0.1	0.2	0.1	0.1
7	Conductivity	µmhos/cm	345	367	418	420
8	Turbidity	NTU	3	3	4	3
9	Magnesium Hardness (as CaCO3)	mg/l	56	60	63	69
10	Total Alkalinity (as CaCO3)	mg/l	130	138	145	146
11	Chloride (as Cl)	mg/l	34	38	45	47
12	sulphate (as SO4)	mg/l	21	19	24	25
13	Nitrate (as NO3)	mg/l	12	8	10	12
14	Fluoride (as F)	mg/l	0.3	0.4	0.4	0.4
15	Sodium (as Na)	mg/l	21	19	26	27
16	Potassium (as K)	mg/l	4.7	4.5	6.1	6.2
17	Total Nitrogen (as N)	mg/l	1.8	1.9	2.2	2.1
18	Total Phosphorous (as PO4)	mg/l	0.11	0.13	0.14	0.13
19	COD	mg/l	7	9	11	12
20	Phenolic compounds (as C6H5OH)	mg/l	<0.001	<0.001	<0.001	<0.001

21	Iron (as Fe)	mg/l	0.14	0.19	0.23	0.22
22	Zinc (as Zn)	mg/l	0.07	0.09	0.1	0.1
23	Arsenic (as As)	mg/l	<0.01	<0.01	<0.01	<0.01
24	Mercury (as Hg)	mg/l	<0.001	<0.001	<0.001	<0.001
25	TDS	mg/l	237	251	278	280
26	Total Coliform	MPN/100ml	1100	1300	1700	1800
27	Faecal Coliform	MPN/100ml	300	500	800	850

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 7.48 and 8.64.
- Dissolved Oxygen (DO) was observed in the range of 7.4 to 7.7 mg/l against the minimum requirement of 4 mg/l.
- BOD values were observed to be in the range of 2 to 3 mg/l.
- Total Coliform examination of surface water samples revealed the presence of total coliform in range of 1100 MPN/100 ml to 1800 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 monitoring period 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 Winter Season

Month	Temperature °C		Wind Speed (Km/Hr)	
	Min	Max	Min	Max
DEC 2022	12	24	1	25
JANUARY 2023	06	18	1	28
FEBRUARY 2023	14	25	2	30

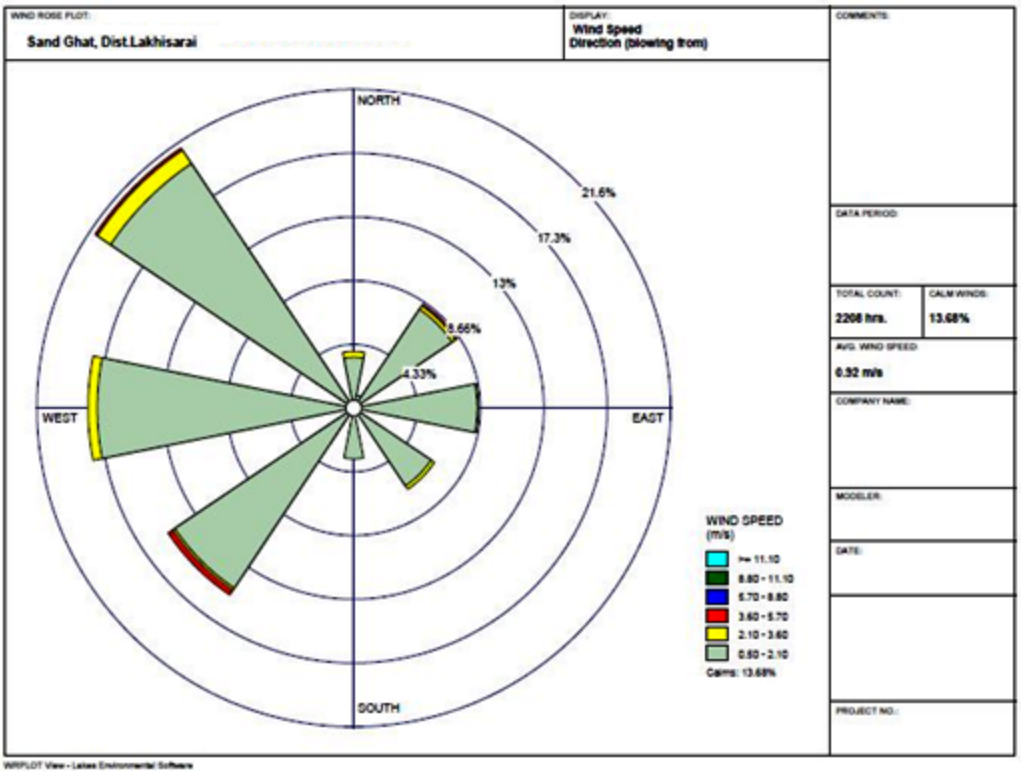

Figure 3.3: Wind Rose Diagram (at site)

3.3.1 Secondary Data Collected from IMD

Secondary data from IMD- Lakshisaraihas 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- Lakshisarai is about 50 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.

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 14 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 98th 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, direction
AAQ1	Mine site	--
AAQ2	Nongarh	1.75, NW
AAQ3	Near Mine site	--
AAQ4	Bhalui village	0.24 Km, East
AAQ5	Mananpur	5.05 Km, East
AAQ6	Mahuliya	3.46 Km, East
AAQ7	Gopalpur	3.09km, SE
AAQ8	Shahnagar	7.25 Km, NW
AAQ9	Sadhmaf	7.00 Km, SW
AAQ10	Dhandh	4.11 Km, S
AAQ11	Ursanwan Village	0.67 Km, NW
AAQ12	Dhanwah Village	5.87 Km, NE
AAQ13	Manjhway	2.32 Km, W
AAQ14	Banshipur	9.56 Km, N

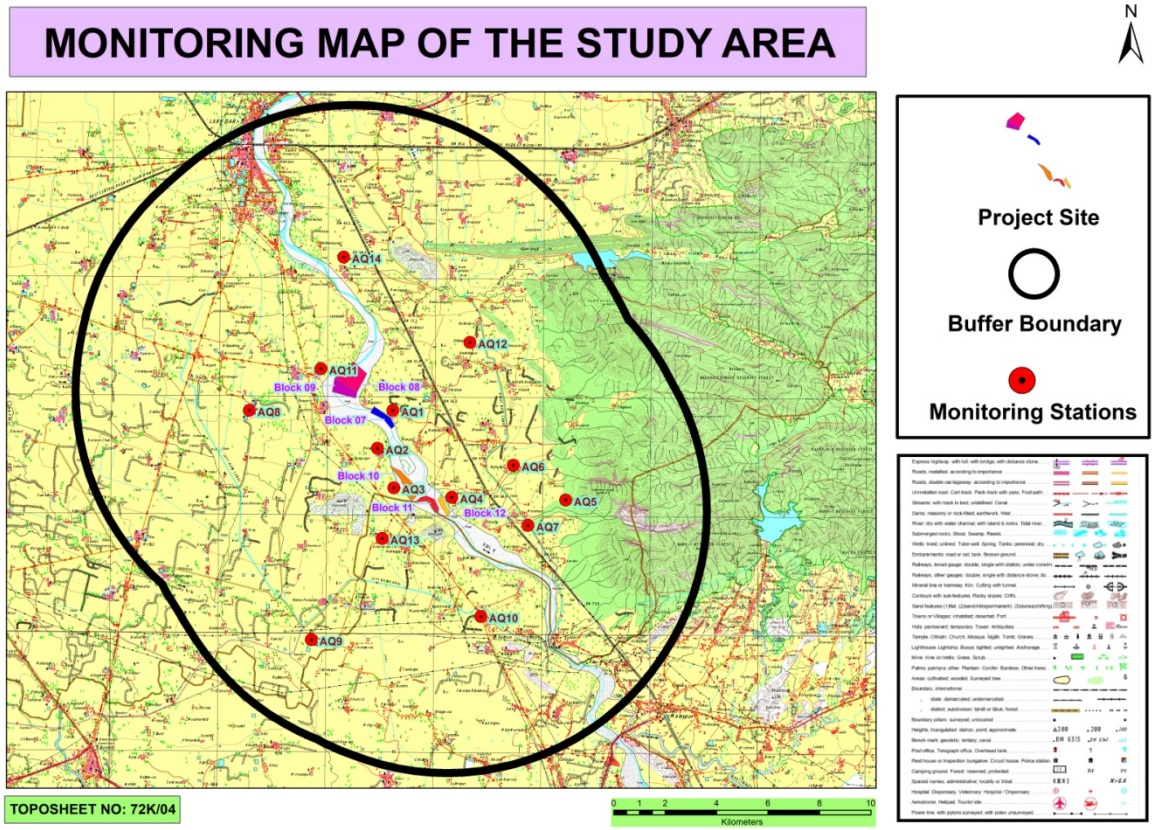

Figure 3.4 Ambient Air Quality Monitoring Stations

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

Location Code	PM2.5 (µg/m^3)				
	Name of the station	**Min**	**Max**	**Average**	**98th Percentile**
AAQ1	Mine site	34.5	51.4	43.6	50.1
AAQ2	Nongarh	35.5	46.9	41.1	46.4
AAQ3	Near Mine site	39.3	52.2	47.4	51.3
AAQ4	Bhalui village	36.9	46.8	42.1	46.6
AAQ5	Mananpur	36.2	48.9	44.9	47.8
AAQ6	Mahuliya	38.6	49.6	45.4	48.0
AAQ7	Gopalpur	34.1	53	45.20	51.85
AAQ8	Shahnagar	28.7	33.2	30.67	32.88
AAQ9	Sadhmaf	29.8	42.2	34.18	41.88
AAQ10	Dhandh	24.5	44	32.59	42.62
AAQ11	Ursanwan Village	29.7	46.3	36.28	45.98
AAQ12	Dhanwah Village	31.8	41.6	35.07	39.90
AAQ13	Manjhway	29	46	38.88	45.86
AAQ14	Banshipur	31.4	46.1	37.88	45.00

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	Mine site	68.3	83.8	76.2	82.9
AAQ2	Nongarh	67.0	80.7	73.3	79.7
AAQ3	Near Mine site	75.1	86.6	80.8	85.7
AAQ4	Bhalui village	65.2	82.9	74.2	81.4
AAQ5	Mananpur	71.1	84.8	78.9	82.3
AAQ6	Mahuliya	73.1	85.6	79.9	84.1
AAQ7	Gopalpur	61.3	90.3	78.23	89.29
AAQ8	Shahnagar	60.6	71.1	66.21	70.50
AAQ9	Sadhmaf	60.6	85.2	71.55	84.00
AAQ10	Dhandh	51.4	74.3	60.87	74.21
AAQ11	Ursanwan Village	57.1	82.4	72.26	82.08
AAQ12	Dhanwah Village	58.7	84.2	70.68	83.28
AAQ13	Manjhway	55.1	83.2	70.14	81.45
AAQ14	Banshipur	56.2	95.9	76.25	94.89

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

Location Code	SO_2 (µg/m^3)				
	Name of the station	Min	Max	Average	98th Percentile
AAQ1	Mine site	4.5	6.7	5.2	5.5
AAQ2	Nongarh	BDL	6.4	5.0	6.3
AAQ3	Near Mine site	5.1	8.6	6.4	8.2
AAQ4	Bhalui village	4.1	7	5.2	5.9
AAQ5	Mananpur	4.1	7.6	5.3	6.3
AAQ6	Mahuliya	5.1	8.5	6.6	7.4
AAQ7	Gopalpur	5.1	9.1	7.05	8.96
AAQ8	Shahnagar	3.5	7.3	5.45	7.07
AAQ9	Sadhmaf	4.5	7.8	6.48	7.71
AAQ10	Dhandh	3.1	6.8	4.53	6.52
AAQ11	Ursanwan Village	3.3	11.3	7.23	11.02
AAQ12	Dhanwah Village	3.6	7.9	5.83	7.67
AAQ13	Manjhway	3.7	8.1	5.71	7.84
AAQ14	Banshipur	3.5	9.5	6.47	8.95

Table 3.12 Ambient Air Quality in the study Area NO2

Location Code	NO_2 (µg/m^3)				
	Name of the station	Min	Max	Average	98th Percentile
AAQ1	Mine site	9.3	16.6	12.1	15.5
AAQ2	Nongarh	9.5	15.4	11.7	14.8
AAQ3	Near Mine site	12.3	18.5	14.2	17.7
AAQ4	Bhalui village	8.9	16.7	11.2	15.5
AAQ5	Mananpur	9.5	16.6	12.6	15.9
AAQ6	Mahuliya	12.2	20.6	14.9	18.5
AAQ7	Gopalpur	11.7	20.5	15.66	20.04
AAQ8	Shahnagar	8.8	13.3	11.00	13.21
AAQ9	Sadhmaf	9.4	17	12.54	16.22
AAQ10	Dhandh	5.7	11.3	7.66	10.93
AAQ11	Ursanwan Village	8.1	21.7	14.78	21.10
AAQ12	Dhanwah Village	7.7	21.4	14.94	20.39
AAQ13	Manjhway	7.6	21.4	13.87	20.80
AAQ 14	Banshipur	8	21.3	14.67	20.38

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 24.5 µg/m^3 to 51.5 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 51.4 µg/$m^3$to 95.9 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 BDL µg/$m^3$to 11.3 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 5.7 µg/$m^3$to 21.4 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	Mine site	1.32	1.53
AAQ2	Nongarh	1.70	1.92
AAQ3	Near Mine site	1.33	1.70
AAQ4	Bhalui village	1.40	1.69
AAQ5	Mananpur	1.27	1.50
AAQ6	Mahuliya	1.31	1.56
AAQ7	Gopalpur	1.67	1.80
AAQ8	Shahnagar	1.25	1.63
AAQ9	Sadhmaf	1.39	1.68
AAQ10	Dhandh	1.26	1.65
AAQ11	Ursanwan Village	1.34	1.53
AAQ12	Dhanwah Village	1.96	1.81
AAQ13	Manjhway	1.22	1.52
AAQ14	Banshipur	1.62	1.71

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 5 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

SITE	Location	Distance, direction
SQ1	Nongarh	1.75, NW
SQ2	Near Mine site	--
SQ3	Bhalui village	0.24 Km, East
SQ4	Mananpur	5.05 Km, East
SQ5	Mahuliya	3.46 Km, East
SQ6	Gopalpur	3.09km, SE
SQ7	Shahnagar	7.25 Km, NW
SQ8	Sadhmaf	7.00 Km, SW
SQ9	Dhandh	4.11 Km, S
SQ10	Ursanwan Village	0.67 Km, NW

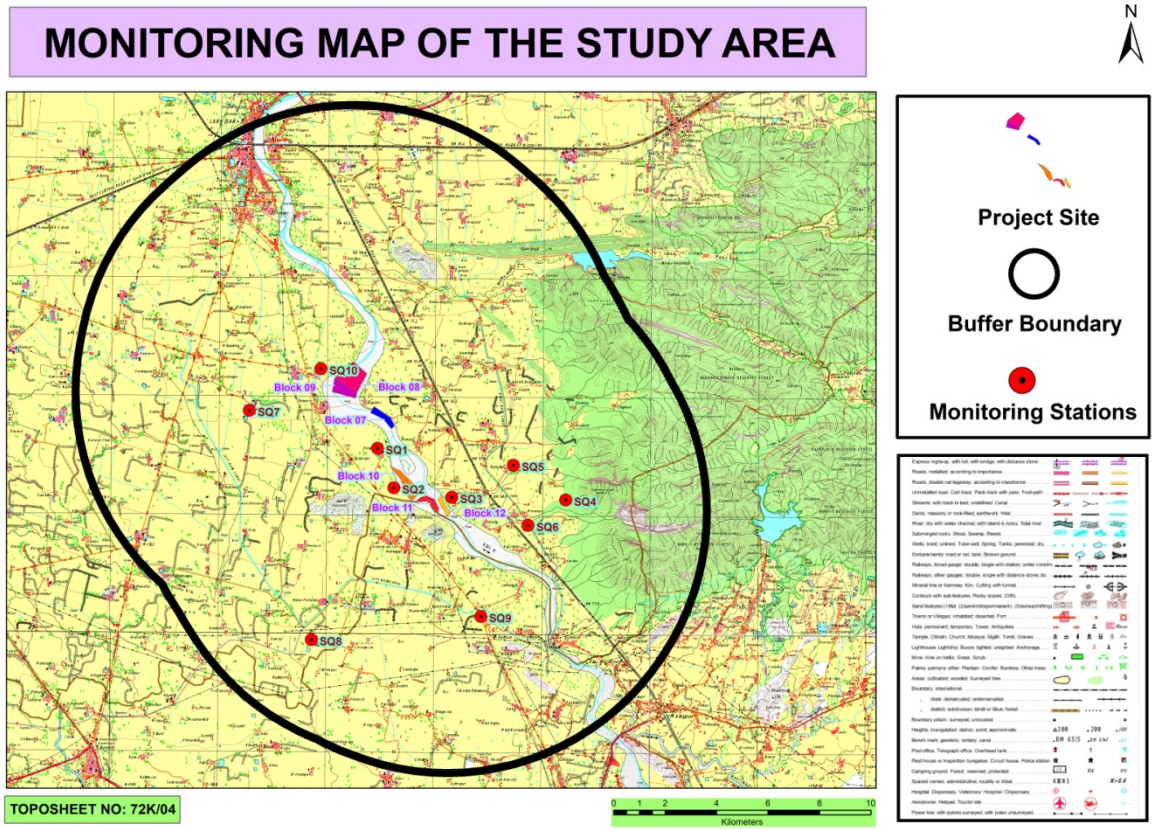

Figure 3.5, Soil Sampling Locations

Table 3.14: Physico-chemical properties of soil

S.No	Parameter	Unit	SQ-1	SQ-2	SQ-3	SQ-4	SQ-5
			Mine site				
1	Silt	%	6.8	18.4	21.3	16.8	8.8
2	Clay	%	8.7	32.5	33.5	11.1	38.7
3	Sand	%	84.5	49.1	45.2	72.1	52.5
4	pH	-	7.55	7.45	8.12	6.44	7.15
5	Electrical Conductivity	µmhos/cm	158	250	378	144	365
6	Cation exchange capacity	meq/100 gm	10.4	17.9	14.4	11.75	18.5
7	Exchangeable Potassium	mg/kg	132	116.2	134.2	125	175
8	Exchangeable Sodium	mg/kg	95.5	134	192	145	168
9	Exchangeable Calcium	mg/kg	1584	2010	2165	1575	2275

10	Exchangeable Magnesium	mg/kg	254	304	387	258	377
11	Sodium Absorption Ratio	-	0.29	0.36	0.43	0.28	0.81
12	Nitrogen	% by mass	0.0271	0.0322	0.0134	0.0241	0.0251
13	Phosphorus(P2O5)	mg/kg	5.57	7.21	5.95	7.47	6.35
14	Zinc (Zn)	mg/kg	12.44	15.21	12.54	12.3	14.55
15	Water Holding Capacity	%	24.7	41.3	38.4	25.7	39.7
16	Porosity	%	47.6	29.4	32.5	26.3	32.5

S.No	Parameter	Unit	SQ-6	SQ-7	SQ-8	SQ-9	SQ-10
1	Texture	-	Sand	Sand	Sandy clay loam	Loamy Sand	Loamy Sand
	Silt	%	3.5	2.8	7.2	59.7	28.0
	clay	%	4.6	7.6	8.5	13.9	34.6
	Sand	%	91.9	89.6	84.3	26.4	37.4
2	pH	-	7.1	7.8	7.6	7.2	7.4
3	Electrical Conductivity	µmhos/cm	121	135	128	155	141
4	Cation exchange capacity	meq/100 gm	4.6	5.2	4.2	3.4	2.3
5	Sodium	mg/kg	54.8	58.6	60.1	70.5	86.4
6	Potassium	mg/kg	15.9	20.1	23.6	28.2	24.3
7	Calcium	mg/kg	216.5	225.9	243.1	314.7	318.8
8	Magnesium	mg/kg	197.2	192.4	190.6	202.8	204.7
9	Sodium Absorption Ratio	-	2.08	2.10	2.12	2.28	2.36
10	Water Holding Capacity	%	17.24	18.2	19.35	36.0	30.18
11	Porosity	%	46.31	45.57	44.82	42.15	46.58

Observations:

Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from 6.44 to 8.12, which shows that the soil is alkaline in nature. Potassium is found .

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.**

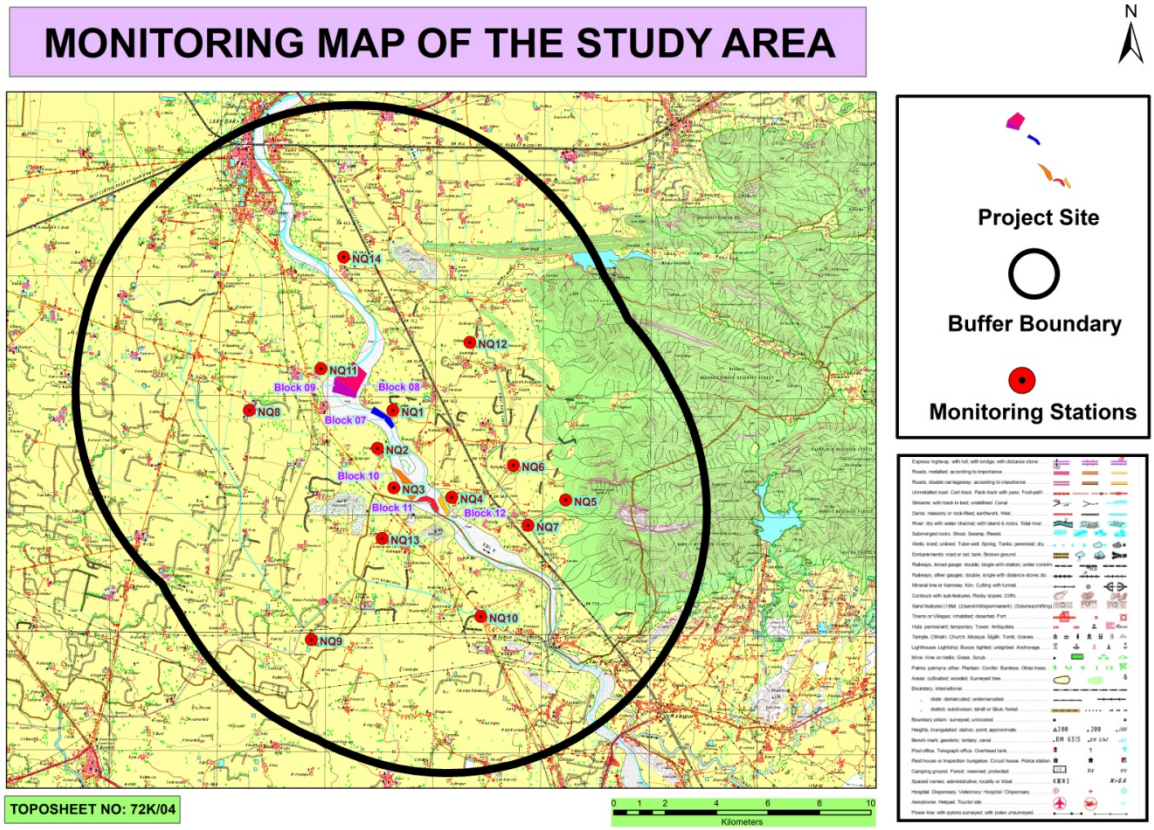

Figure 3.6 Noise Monitoring Stations

Table 3.15: Noise quality monitoring stations

SITE	Location	Distance, direction
NQ1	Mine site	--
NQ2	Nongarh	1.75, NW
NQ3	Near Mine site	--
NQ4	Bhalui village	0.24 Km, East

NQ5	Mananpur	5.05 Km, East
NQ6	Mahuliya	3.46 Km, East
NQ7	Gopalpur	3.09km, SE
NQ8	Shahnagar	7.25 Km, NW
NQ9	Sadhmaf	7.00 Km, SW
NQ10	Dhandh	4.11 Km, S
NQ11	Ursanwan Village	0.67 Km, NW
NQ12	Dhanwah Village	5.87 Km, NE
NQ13	Manjhway	2.32 Km, W
NQ14	Banshipur	9.56 Km, N

Table 3.16: Noise Monitoring Results

S. No.	Locations		Equivalent Noise Level, dB (A)			
			Limit (as per CPCB Guidelines),Leq, dB(A)		Observed value Leq, dB(A)	
			DAY*	NIGHT*	DAY*	NIGHT*
1	NQ1	Industrial Zone	75	70	55.44	43.34
2	NQ2	Residential Zone	55	45	43.16	39.45
3	NQ3	Residential Zone	55	45	42.88	36.67
4	NQ4	Residential Zone	55	45	43.16	36.46
5	NQ5	Residential Zone	55	45	40.67	34.54
6	NQ6	Residential Zone	55	45	39.67	32.54
7	NQ7	Residential Zone	55	45	38.67	36.54
8	NQ8	Residential Zone	55	45	41.16	36.45
9	NQ9	Residential Zone	55	45	43.70	36.98
10	NQ10	Residential Zone	55	45	44.25	35.46
11	NQ11	Residential Zone	55	45	43.14	34.54
12	NQ12	Residential Zone	55	45	40.12	35.36
13	NQ13	Residential Zone	55	45	42.12	35.25
14	NQ14	Residential Zone	55	45	39.15	37.26

Results

Noise monitoring reveals that the minimum & maximum noise levels at day time were recorded as 38.67 dB (A), 55.45 dB(A). The minimum&maximum noise levels at night time were found to be 32.54 dB (A) & 43.54 dB(A) at NQ11respectively.

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 Kiul River At Lakhisarai Block No.-9 Sand Ghat.

3.6.2 Description of the study area

The Proposed Sand Mining Project was located on Kiul River at Block No – 9 Sand Ghat at Ghat at Mauza– Nongarh, Chanan Dist - Lakhisarai (Bihar).

As per District Survey Report Lakhisarai (Page no 53) the Proposed sand Ghats of block 07, block 8, block 9, block 10, block 11 & block 12 are comes in cluster situation whose combined cluster area is 141.8 ha. All the lease area of homogeneous minerals is coming within 500 m radius from each other confirming a cluster situation.

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**.** However, bhimband wildlife Sanctuariesare present in 10 km of study area

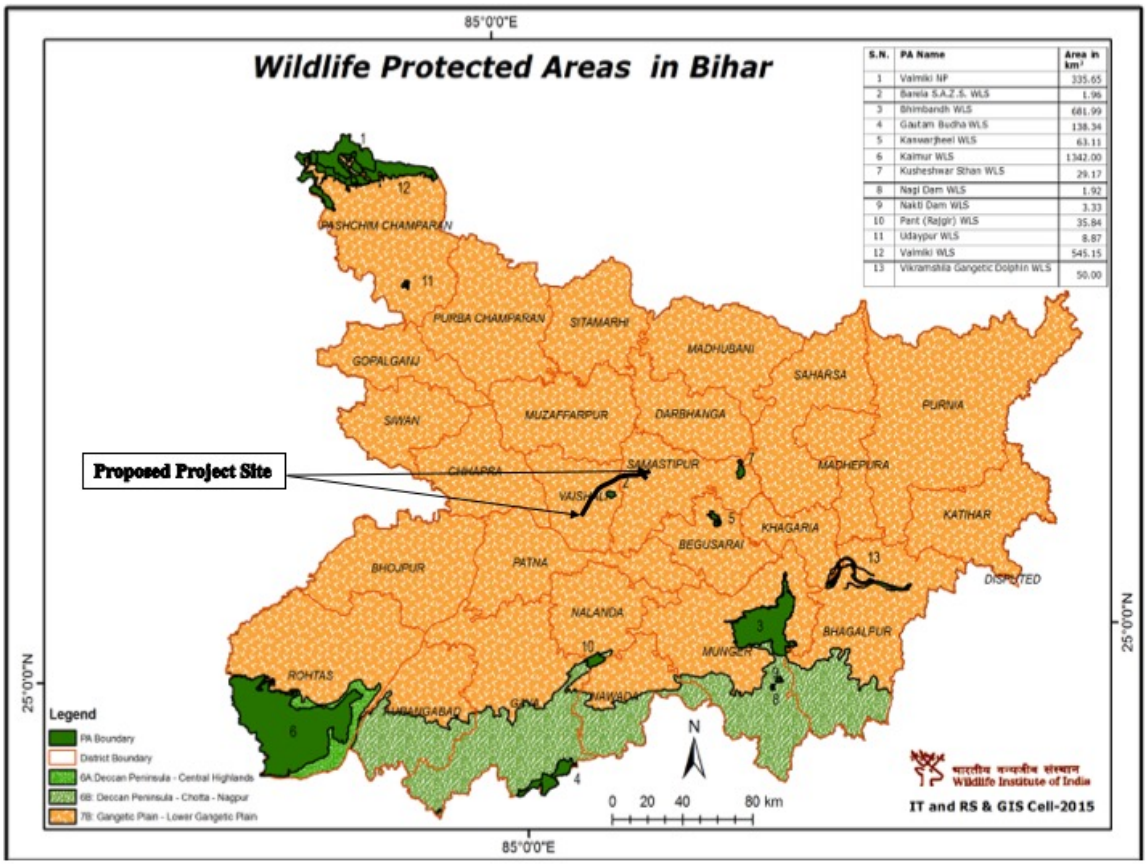

Figure 3.7: Map of Eco-Sensitive Zone of the Study Area

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 winter period (Dec-Feb 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 of Lakhisarai , 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 samplingsites (TS-1 to TS-5) were 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 (AS-1 to AS-5) were also selected at different locations in the study area (Table 3.17 and Figure 3.8 & 3.9).

Table 3.17: List of Sampling Location Selected for Study of Biological Environment

Sampling Stations for Terrestrial Flora-Fauna				
S. No.	**Location Name**	**Zone**	**Latitude**	**Longitude**
TS-1	EB1	Core and Buffer	86°8' 58.309" E	25°3' 9.226" N
TS-2	EB2	Core and Buffer	86°12' 38.274" E	25°5' 59.737" N
TS-3	EB3	Core and Buffer	86°13' 2.893" E	25°2' 0.117" N
TS-4	EB4	Core and Buffer	86°6' 34.762" E	25°0' 15.393" N
TS-5	EB5	Core and Buffer	86°5' 48.144" E	25°4' 55.236" N
Sampling Stations for Aquatic Flora and Fauna				
S. No.	**Location Name**	**Zone**	**Latitude**	**Longitude**
AS-1	TS-1	EB1	Core and Buffer	86°8' 58.309" E
AS-2	TS-2	EB2	Core and Buffer	86°12' 38.274" E
AS-3	TS-3	EB3	Core and Buffer	86°13' 2.893" E
AS-4	TS-4	EB4	Core and Buffer	86°6' 34.762" E
AS-5	TS-5	EB5	Core and Buffer	86°5' 48.144" E

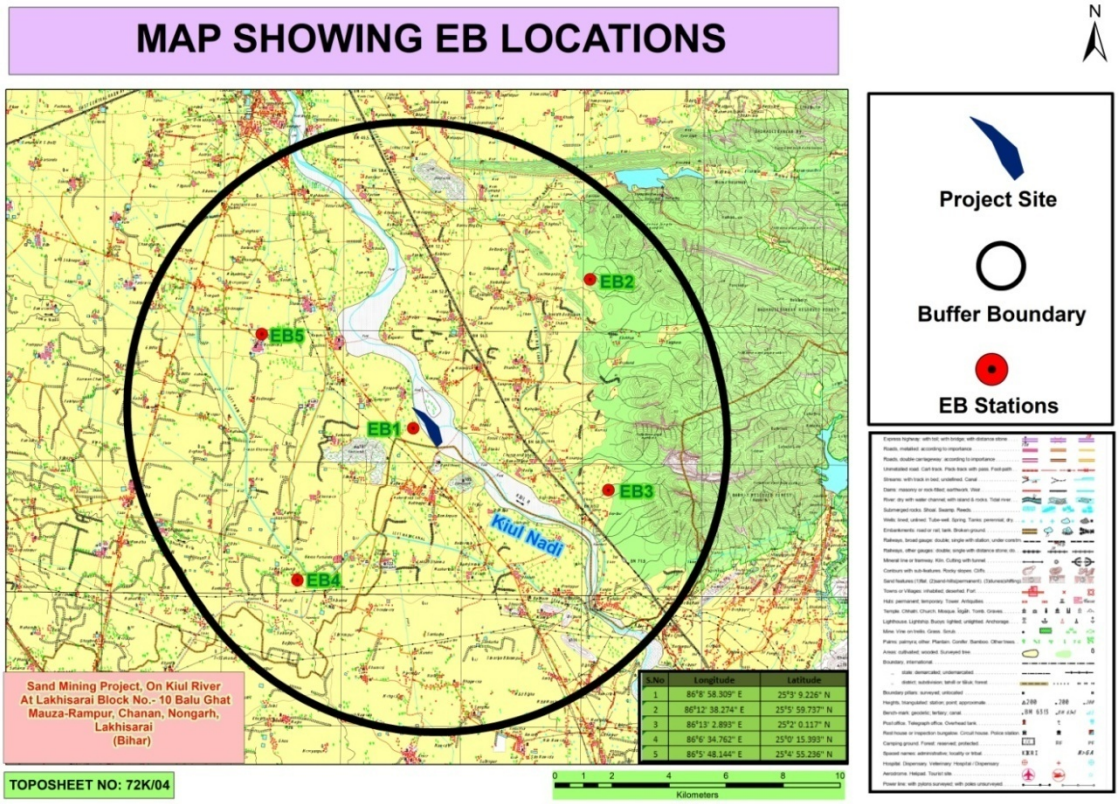

Figure 3.8: Location of Terrestrial Sampling (TS) sites for Flora-Fauna

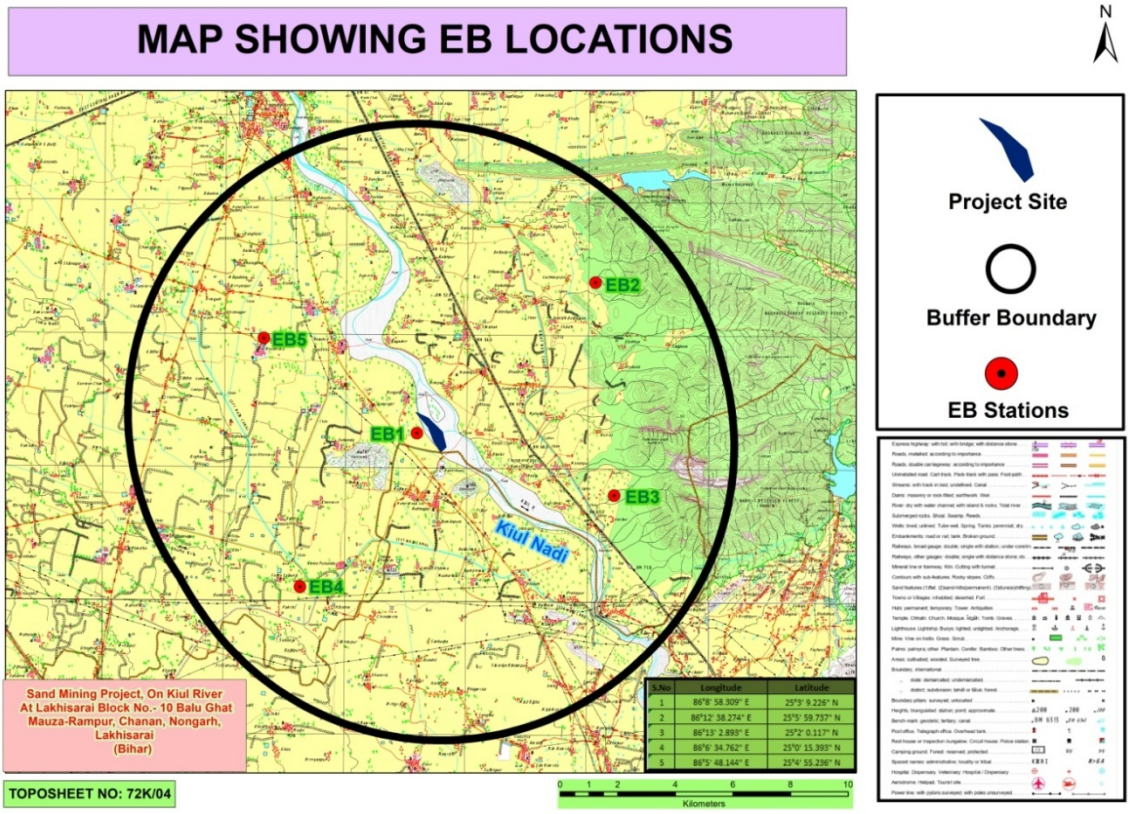

Figure 3.9: Location of Aquatic Sampling (AS) sites of Flora-Fauna

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 Lakhisarai 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 (Lakhisaraidistrict)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, Lakhisarai		

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 tables3.19, 3.20 & 3.21, and Figures3.10 & 3.11.

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 and Figure 3.10.

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	IUCN

										Status in WPA (1972)	Status
	Chlorophyceae									NA	NA
1	*Ankistrodesmus* sp.			+	+	+	+			NA	NA
2	*Ankistrodesmus falcatus*		+	+			+	+	+	NA	NA
3	*Arthrodesmus* sp.	+		+	+		+		+	NA	NA
4	*Chlorella* sp.		+	+	+	+	+	+	+	NA	NA
5	*Chlorella vulgaris*	+		+	+	+			+	NA	NA
6	*Chlorococcum* sp.	+	+	+			+		+	NA	NA
7	*Closteriopsis* sp.	+	+		+	+		+		NA	NA
8	*Closterium quadratulum*						+	+	+	NA	NA
9	*Coelastrum* sp.	+	+	+	+		+		+	NA	NA
10	*Cosmarium aequale*			+	+		+	+		NA	NA
11	*Cosmarium formii*	+	+	+	+	+	+		+	NA	NA
12	*Cosmarium margaritatum*	+		+	+		+	+		NA	NA
13	*Crucigenia* sp.	+	+	+	+		+			NA	NA
14	*Gonium* sp.	+		+		+	+		+	NA	NA
15	*Oocystis crassa*	+	+			+	+	+	+	NA	NA
16	*Pediastrum duplex*	+	+	+	+		+		+	NA	NA
17	*Pediastrum simplex*			+	+	+				NA	NA
18	*Scenedesmus armatus*	+	+	+		+	+	+	+	NA	NA
19	*Scenedesmus bijugatus*	+		+	+	+	+		+	NA	NA
20	*Spirogyra* sp.	+	+	+		+	+	+		NA	NA
21	*Tetraedron trigonum*				+		+		+	NA	NA
22	*Tetrastrum* sp.	+	+	+		+	+		+	NA	NA
23	*Treubaria triappendiculata*			+		+	+	+	+	NA	NA
24	*Ulothrix* sp.	+	+	+	+	+	+	+		NA	NA
25	*Ulothrix zonata*	+		+		+	+		+	NA	NA
26	*Volvox* sp.	+	+	+		+	+			NA	NA
27	*Zygnema* 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	*Anabaena flosaque*	+	+		+	+	+	+	+	NA	NA
4	*Anacystis* sp.	+		+		+	+		+	NA	NA
5	*Aphanocapsa* sp.	+		+	+	+	+	+	+	NA	NA
6	*Aphanothece* sp.	+	+		+	+			+	NA	NA
7	*Chroococcus* sp.	+		+	+	+	+	+		NA	NA
8	*Gloeocapsa* sp.	+	+	+			+		+	NA	NA
9	*Lyngbya* sp.	+	+		+	+	+	+	+	NA	NA
10	*Merismopedia* sp.	+	+	+		+	+	+	+	NA	NA
11	*Merismopedia tenuissima*	+		+	+	+	+			NA	NA
12	*Microcystis* sp.		+		+			+	+	NA	NA
13	*Microcystis aeruginosa*	+		+			+			NA	NA
14	*Nostoc* sp.		+		+	+	+	+	+	NA	NA
15	*Oscillatoria subbrevis*	+			+		+		+	NA	NA
16	*Spirulina* sp.		+	+	+	+	+	+		NA	NA
17	*Spirulina laxissima*		+	+		+	+		+	NA	NA
	Total	**12**	**11**	**11**	**12**	**13**	**15**	**9**	**12**		
	Bacillariophyceae									NA	NA
1	*Achnanthes* sp.	+	+	+	+		+	+	+	NA	NA
2	*Amphora ovalis*	+				+	+		+	NA	NA
3	*Amphora* sp.	+	+	+	+	+		+		NA	NA
4	*Cocooneis* sp.	+	+		+		+	+	+	NA	NA
5	*Cyclotella* sp.			+		+	+	+	+	NA	NA
6	*Cymbella affinis*	+		+	+		+		+	NA	NA
7	*Eunotia major*	+	+		+	+		+		NA	NA
8	*Fragillaria pinnata*		+	+		+	+		+	NA	NA
9	*Gomphonema* sp.	+			+		+	+	+	NA	NA
10	*Gomphonema lanceolatum*	+	+	+	+	+			+	NA	NA
11	*Melosira* sp.	+	+	+	+	+	+			NA	NA
12	*Melosira granulata*	+				+	+	+		NA	NA
13	*Navicula similis*	+	+	+	+		+	+	+	NA	NA

14	*Navicula subrhyncocephala*	+	+		+		+		+	NA	NA
15	*Nitzschia palea*	+	+		+	+	+			NA	NA
16	*Pinnularia sp.*	+	+	+				+	+	NA	NA
17	*Synedra acus*	+				+	+		+	NA	NA
18	*Synedra ulna*		+		+	+	+	+	+	NA	NA
19	*Tabellaria* sp.	+			+		+			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
Cyanophyceae	12	11	11	12	13	15	9	12
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**

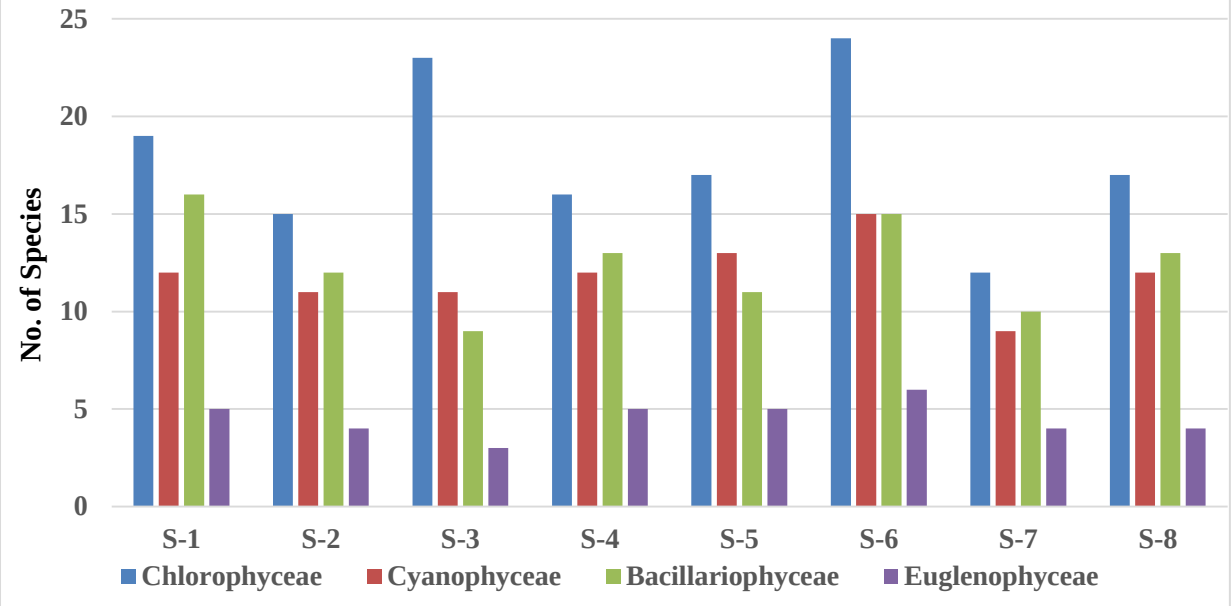

Figure 3.10: Site wise variation of Phytoplankton species in the Core and Buffer Zone

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 and Figure 3.11.

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**

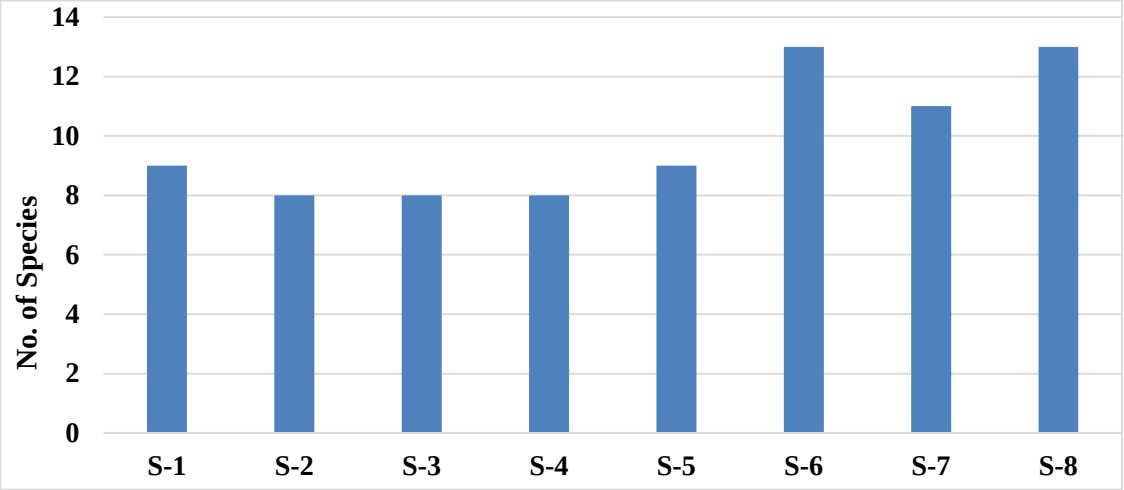

Figure 3.11: Qualitative list of Aquatic Macrophytic vegetation of Core and Buffer Zone

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 102 species of plant species were observed from the study area. Out of 103 plant species, 53 species of tree, 25 species of shrubs/herbs, 14 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 09 different locations and data supported by the Department of

Forest, Lakhisaraidistrict 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 auriculiformis*	Austrelian babul	Fabaceae
2	*Acacia leucophloea*	Safed babul	Mimosaceae
3	*Acacia nilotica*	Babool	Mimosaceae
4	*Acacia nilotica*	Desi babool	Fabaceae
5	*Aegle marmelos*	Bel	Rutaceae
6.	*Ailanthus excels*	Adusa	Simaroubaceae
7	*Albizzia amara*	Siris	Mimosoideae
8	*Albizzia lebbeck*	Sirish	Mimosaceae
9	*Alstonia scholaris*	Saptaparni	Apocynaceae
10	*Anogeissus latifolia*	Dhaura,	Combretaceae
11	*Anthocephalus cadamba*	Kadamb	Rubiaceae
12	*Artocorpus heterophyllus*	Jack fruit	Moraceae
13	*Azadirachta indica*	Neem	Meliaceae
14	*Bambusa arundinacea*	Katang bamboo	Poaceae
15	*Bauhinia racemosa*	Apta	Leguminosae
16	*Bauhinia variegata L.*	Kachnar	Leguminosae
17	*Bombax ceiba*	Semal	Malvaceae
18	*Bombax malabaricum*	Semal tree	Malvaceae
19	*Borassus flabellifer*	Nariyal	Palmae
20	*Butea monosperma*	Palas	Leguminosae
21	*Cassia fistula*	Bahawa	Caesalpinaceae
22	*Cassia siamea*	Chirkundi	Mimosaceae
23	*Dalbergia latifolia*	Shisam	Leguminosae
24	*Dalbergia sissoo*	Shisam	Leguminosae
25	*Delonix regia*	Gulmohar	Fabaceae
26	*Dendrocalamus strictus*	Bamboo	Poaceae

27	*Diospyros melanoxylon*	Tendu	Ebenaceae
28	*Diospyros melanoxylon*	Timru	Ebenaceae
29	*Eucalyptus globules*	Nilgiri	Myrtaceae
30	*Ficus benghalensis*	Vad	Moraceae
31	*Ficus benghalensis*	Bargad	Moraceae
32	*Ficus religiosa*	Pipal	Moraceae
33	*Madhuca longifolia*	Mohua tree	Sapotaceae
34	*Magnifera indica*	Aam	Anacardiaceae
35	*Melia azedarach*	Bukkam Neem	Meliaceae
36	*Moringa olerifera*	Munga	Moringanaceae
37	*Musa paradisiacal*	Banana	Musaceae
38	*Nerium oleamder*	Kaner	Apocynaceae
39	*Phoenix sylvestris*	Date palm	Arecaceae
40	*Phyllanthus emblica*	Awla	Euphorbiaceae
41	*Pisidium guava*	Guava	Myrtaceae
42	*Pongamia pinnata*	Karanj	Leguminosae
43	*Prosopis juliflora*	Vilayati babool	Fabaceae
44	*Pterocarpus marsupium*	Bija	Leguminosae
45	*Punica malus*	Anar	Lythraceae
46	*Sarracca indica*	Ashok	Annonaceae
47	*Shorea robusta*	Sal	Depterocarpaceae
48	*Syzygium cumini*	Jamun	Myrtaceae
49	*Tectona grandis*	Sagwan	Verbenaceae
50	*Terminalia arjuna*	Arjun	Combretaceae
51	*Terminalia chebula*	Harhar	Combretaceae
52	*Zizyphus jujube*	Ber	Rhamnaceae
53	*Zyziphus mauritiana*	Ber	Rhamnaceae
Shrub & Herbs			
54	*Acanthospermum hispidum*	Kanti	Asteraceae
55	*Acheranthus aspera*	Aghada	Amaranthaceae
56	*Antigonum leptopus*	coral vine	Polygonaceae
57	*Argemone mexicana*	Pila dhtura	Papaveraceae
58	*Baugainvellia glabra*	Paper flower	Nyctaginaceae

59	*Calotropis procera*	Aakra	Asclepiadaceae
60	*Cassia auriculata*	Tarwar	Fabaceae
61	*Cassia tora*	Tarota /Takla	Caesalpiniaceae
62	*Chenopodium album*	manure weed	Amaranthaceae
63	*cleome viscosa*	Pivali tilval	Cleomaceae
64	*Dalura metel*	Dhotra	Solanaceae
65	*Echinops echinatus*	Unthkantali	Asteraceae
66	*Ervatamia divaricata*	Chandani	Apocynaceae
67	*Euphorbia hirta*	Mothi dudhi	Evphorbiaceae
68	*Ipomoea carnea*	Besharam	Convolvulaceae
69	*Jatropha gossipifolia*	cotton-leaf	Euphorbiaceae
70	*Lantana camara*	Ghaneri	Verbenaceae
71	*Mimosa pudica*	Chui Mui	Mimosaceae
72	*Ocimum sanctum*	Tulsi	Labiatae
73	*Parthenium hysterophorus*	Gajar grass	Asteraceae
74	*Ricinus communis*	Arand	Euphorbiaceae
75	*Ricinus communis*	castor oil plant	Euphorbiaceae
76	*Solanum surattense*	Bhuiringani	Solanaceae
77	*Tridax procumbens*	Kambarmodi	Asteraceae
78	*Xanthium strumarium*	Chota Dhatura	Asteraceae
Grasses			
79	*Apluda mutica*	Mauntian grass	Poaceae
80	*Apluda mutica*	Banjura grass	Poaceae
81	*Commelina benghalensis*	Bokna	Commelinaceae
82	*Cynodon dactylon*	Doob	Poaceae
83	*Cyperus rotundus*	Motha	cyperaceae
84	*DactylSeptemberenum aegyptium*	Crow foot grass	Poaceae
85	*Digitaria ternate*	--	Graminae
86	*Kyllinga tenufolia*	--	Cyperaceae
87	*Pennisetum purpureum*	Elephant grass	Poaceae
88	*Saccharum spontaneum*	kans	Poaceae
Climbers			
89	*Abrus precatorius*	Gunja	Fabaceae

90	*Antigonon leptopus*	Anantalata	Polygonaceae
90	*Bougainvillea glabra*	Booganbel	Nyctaginaceae
92	*Celastrus paniculata*	Kujari	Celastraceae
93	*Cissampelos pareira*	Khariya lata	Menispermaceae
94	*Clitoria ternatea*	Blue pea	Fabaceae
95	*Coccinia grandis*	Jungli Kundru	Cucurbitaceae
96	*Combretum indicum*	Madhu Malati	Combretaceae
97	*Cuscuta reflexa*	Amarbel	Convolvulaceae
98	*Cuscuta reflexa*	Amar bel	Convolvulaceae
99	*Hemidesmus indicus*	Anantamul	Apocynaceae
100	*Ipomoea cairica*	Neeli Bel	Convolvulaceae
101	*Tilospora cordifolia*	Giloy	Menispermaceae
102	*Zizyphus oenoplia*	Makor	Rhamnaceae

Source: Primary data of P&M Solution, Noida and data supported by the Department of Forest,
Lakhisaraidistrict 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 Goat (*Capra aegagrus*); Buffalo (*Bubalus 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 (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.	Common skink	*Eutropis carinata*	Scincidae	IV	LC
10.	King cobra	Ophiophagus hannah	Elapidae	II	LC
11.	Cobra	Naja naja	Elapidae	II	LC
12.	Pit viper	Crotolus sp	Viperadae	II	LC
13.	Garden lizard	Calotes versicolor	Agamidae	IV	NE
14.	House Gecko	Hemidactylus flaviviridis	Gekkonidae	--	
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
5	Ardeola grayii	Indian pond heron	Ardeidae	IV	LC
6	Bubulcus ibis	Cattle egret	Ardeidae	IV	LC
7	*Columba livia*	Pigeon	Columbidae	IV	LC
8	*Corvus macrorhynchos*	Jungle crow	Corvidae	IV	LC
9	*Corvus splendens*	Crow	Corvidae	V	LC
10	*Dicrurus adsimilis*	Black drango	Dicruridae	IV	LC
11	*Gallinule chloropus*	Common moorhen	Rallidae	IV	LC
12	*Milvus migrans*	Black Kite	Accipitridae	IV	LC
13	*Passer domesticus*	House sparrow	Passeridae	IV	LC
14	*Phalacrocorax niger*	Little cormorant	Phalacrocoracidae	IV	LC
15	*Pycnonotus cafer*	Red-vented bulbul	Pycnonotidae	IV	LC
16	Saxicoloides fulicatus	Indian robin	Psittaculidae	IV	LC
17	*Turdoides caudate*	Common babbler	Leiothrichidae	IV	LC
18	*Upupa epops*	Common hoopoe	Upupidae	IV	LC
19	*Vanellus indicus*	Red-wattled lapwing	Charadriidae	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, Lakhisaraidistrict 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,
Lakhisaraidistrict 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 zone

To prepare a detailed report on the status of faunal biodiversity of the present study area (1 km buffer) of Lakhisaraidistrict 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 (*Bubalus 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	Canidae	II	LC

		Mongoose			
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	*Eutropis carinata*	Common skink	Scincidae	IV	LC
8	Hemidactylus flaviviridis	House Gecko	Gekkonidae	--	NE
9	*Naja naja*	Cobra	Elapidae	II	LC
10	Ophiophagus hannah	King cobra	Elapidae	II	LC
11	Ptyas mucosa	Rat Snake	Colubridae	II	NE
12	Rana temporaria	Common frog	Ranidae	IV	LC
13	Testudo graeca	Common Tortoise	Testudinidae	IV	VU
14	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, LakhisaraiDistrict.

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	*Amaurornis phoenicurus*	White-breasted waterhen	Rallidae	IV	LC
6	*Ardea cinerea*	Grey heron	Ardeidae	IV	LC
7	*Ardea purpurea*	Purple heron	Ardeidae	IV	LC
8	Ardeola grayii	Indian pond heron	Ardeidae	IV	LC
9	Athene brama	Spotted Owlet	Strigidae	IV	LC
10	Bubulcus ibis	Cattle egret	Ardeidae	IV	LC
11	*Butorides striatus*	Striated heron	Ardeidae	IV	LC
12	*Casmerodius albus*	Great egret	Ardeidae	IV	LC
13	*Centropus sinensis*	Crow pheasant	Cuculidae	IV	LC
14	*Ceryle rudis*	Pied kingfisher	Alcedinidae	IV	LC
15	*Charadrius dubius*	Little ringed plover	Charadriidae	IV	LC
16	*Ciconia episcopus*	White-necked stork	Ciconidae	IV	NT
17	Cinnyris asiaticus	Purple Sunbird	Psittaculidae	IV	LC
18	*Columba livia*	Pigeon	Columbidae	IV	LC
19	*Corvus macrorhynchos*	Jungle crow	Corvidae	IV	LC
20	*Corvus splendens*	Crow	Corvidae	V	LC
21	*Dendrocygna icolour*	Fulvous whistling duck	Anatidae	IV	LC
22	*Dicrurus adsimilis*	Black drango	Dicruridae	IV	LC
23	Egretta alba	Larger egret	Ardeidae	IV	LC

24	*Egretta garzetta*	Little egret	Ardeidae	IV	LC
25	*Francolinus pondicerianus*	Titar	Phasianidae	IV	LC
26	*Gallinule chloropus*	Common moorhen	Rallidae	IV	LC
27	*Gallus gallus*	Jungle hen	Phasianidae	IV	LC
28	*Halcyon smymensis*	White-throated kingfisher	Alcedinidae	IV	LC
29	*Milvus migrans*	Black Kite	Accipitridae	IV	LC
30	*Nycticorax nycticorax*	Black-crowned night heron	Ardeidae	IV	LC
31	*Passer domesticus*	House sparrow	Passeridae	IV	LC
32	*Pelecanus onocrotalus*	Great white pelican	Pelecanidae	IV	LC
33	*Phalacrocorax carbo*	Great cormorant	Phalacrocoracidae	IV	LC
34	*Phalacrocorax niger*	Little cormorant	Phalacrocoracidae	IV	LC
35	*Pluvialis fulva*	Pacific golden plover	Charadriidae	IV	LC
36	*Pseudibis papillosa*	Red-naped ibis	Threskiornithidae	IV	LC
37	*Psittacula krameri*	Rose ringed Parakeet	Psittacidae	IV	LC
38	*Pycnonotus cafer*	Red-vented bulbul	Pycnonotidae	IV	LC
39	*Sarkidiornis melanotos*	Knob-billed duck	Anatidae	IV	LC
40	Saxicoloides fulicatus	Indian robin	Psittaculidae	IV	LC
41	Spilopelia senegalensis	Little brown dove	Columbidae	IV	LC
42	Sturnia pagodarum	Brahminy Starling	Sturnidae	IV	LC
43	*Sturnus contra*	Asian pied starling	Sturnidae	IV	LC
44	*Tachybaptus ruficolli*	Little grebe	Podicipitidae	IV	LC
45	*Tadorna ferruginea*	Ruddy shelduck	Anatidae	IV	LC
5	*Tringa tetanus*	Common redshank	Charadriidae	IV	LC
46	*Turdoides caudate*	Common babbler	Leiothrichidae	IV	LC
47	*Upupa epops*	Common hoopoe	Upupidae	IV	LC
48	*Vanellus indicus*	Red-wattled lapwing	Charadriidae	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, Lakhisarai, 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	*Crocothemis erythraea*	Scarlet dragonfly	Libellulidae	LC
4	*Danaus chrysippus*	Plain Tiger	Nymphalidae	LC
5	*Danaus genutia*	Stripped Tiger	Nymphalidae	LC
6	*Euploea core*	Common crow	Nymphalidae	LC
7	*Eurema brigitta*	Small grass yellow	Pieridae	LC
8	*Tirumala limniace*	Blue tiger	Nymphalidae	LC

Source: Primary Survey data of P&M Solution and the data supported by Department of Forest, Lakhisarai, 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.). Jammuari 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 (LakhisaraiDistrict) 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 60 zooplankton species was recorded and

identified comprising of class Protozoa (10 species), Rotifera (23 species), Cladocera (12 species), Copepoda (11 species), and Ostracoda (4 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 WPA (1972)	IUCN Status
	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	*Difflugia* sp.	+	+	+	+		+	+	+	NA	NA
7	*Difflugia cuminata*	+	+		+	+	+		+	NA	NA
8	*Euglypha* sp.	+		+	+	+	+	+	+	NA	NA
9	*Metopus* sp.		+	+	+		+			NA	NA
10	*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	*Keratella Tropica*	+	+		+		+	+		NA	NA
17	*Lecane* sp.				+		+	+	+	NA	NA
18	*Lecane luna*	+		+		+	+		+	NA	NA
19	*Monostyla quadridentatus*		+	+						NA	NA
20	*Mytilina* sp.	+			+	+	+	+	+	NA	NA
21	*Polyarthra vulgaris*	+		+		+			+	NA	NA
22	*Testudinella patina*		+		+		+	+		NA	NA
23	*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	*Daphnia pulex*	+			+	+	+		+	NA	NA
9	*Diaphnosoma excisum*	+	+	+			+	+		NA	NA
10	*Leydgia* sp.		+	+		+	+		+	NA	NA
11	*Moina daphnia*	+			+		+	+	+	NA	NA
12	*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
9	*Paradiaptomus* sp.	+		+	+		+		+	NA	NA
10	*Thermocyclops* sp.	+	+	+	+	+	+	+	+	NA	NA
11	*Thermocyclops crassus*	+	+	+	+	+	+	+	+	NA	NA
	Total	**10**	**10**	**8**	**9**	**7**	**11**	**7**	**9**		
	Ostracoda										
1	*Cyprinotus* sp.	+		+	+	+	+	+	+	NA	NA
2	*Cypris sp.*	+	+	+	+		+	+	+	NA	NA
3	*Stenocypris* sp.	+	+	+	+	+	+	+	+	NA	NA
4	*Stenocypris malcolmsoni*	+	+	+	+	+	+		+	NA	NA
	Total	**4**	**3**	**4**	**4**	**3**	**4**	3	**4**		

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

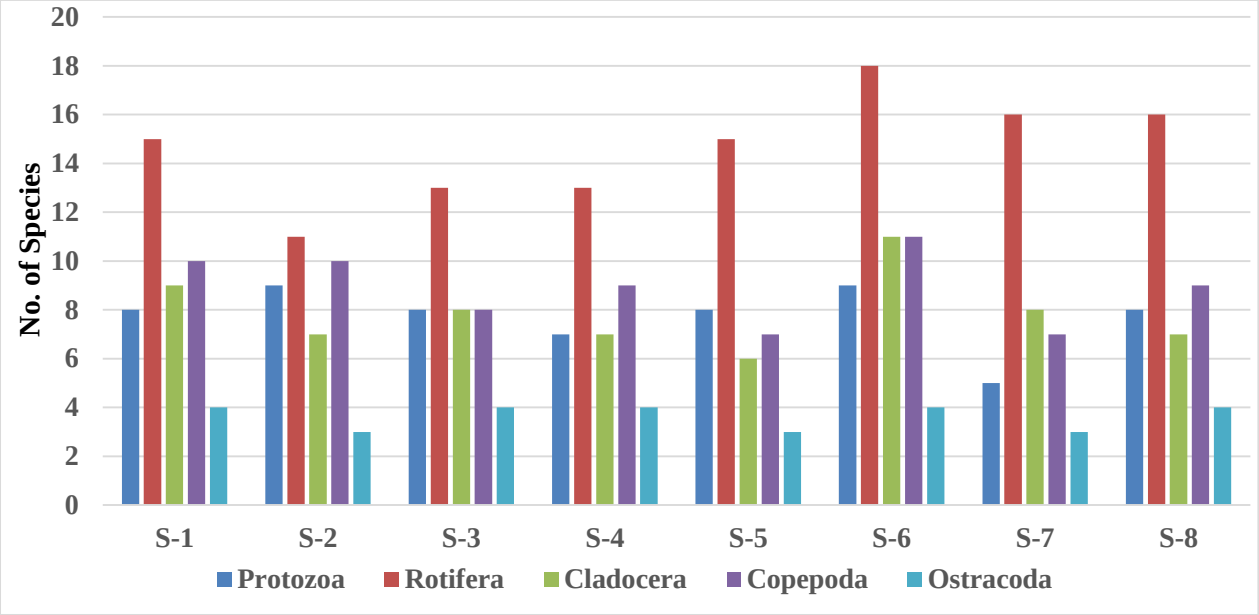

Figure 3.12: Site wise qualitative variation in Zooplankton species in the study area

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	*Dragon flies nymphs*	+		+	+		+	+	+	NA	NE
7	*Ephydra larvae*	+	+	+	+	+	+			NA	NE
8	*Hirudineria glossophonia*		+			+	+	+	+	NA	NE
9	*Hirudineria sp.*	+	+	+			+	+	+	NA	NE
10	*Limnodrillus hoffmeisteri*	+					+			NA	NE
11	*Mayflies nymphs*		+		+		+	+	+	NA	NE
12	*Mosquitos larvae*	+	+	+	+	+	+	+	+	NA	NE
13	*Ranatra elongata*	+	+			+	+	+	+	NA	NE
14	*Ranatra filliformis*	+		+	+	+	+	+	+	NA	NE
15	*Stone flies nymphs*			+	+		+			NA	NE
16	*Tubifex tubifex*	+	+	+		+	+	+	+	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	*Pila sp.*	+		+	+	+	+	+	+	NA	NE
11	*Thira sp.*	+	+	+			+	+	+	NA	NE
12	*Thira tuberculata*	+	+	+	+		+		+	NA	NE
13	*Unio tigridis*			+	+		+	+	+	NA	NE
14	*Vivipara bengalensis*			+	+	+	+	+		NA	NE
	Total	**9**	**8**	**12**	**10**	**8**	**13**	**9**	**11**		
	Source: Primary Survey data of P&M Solution, Noida.										

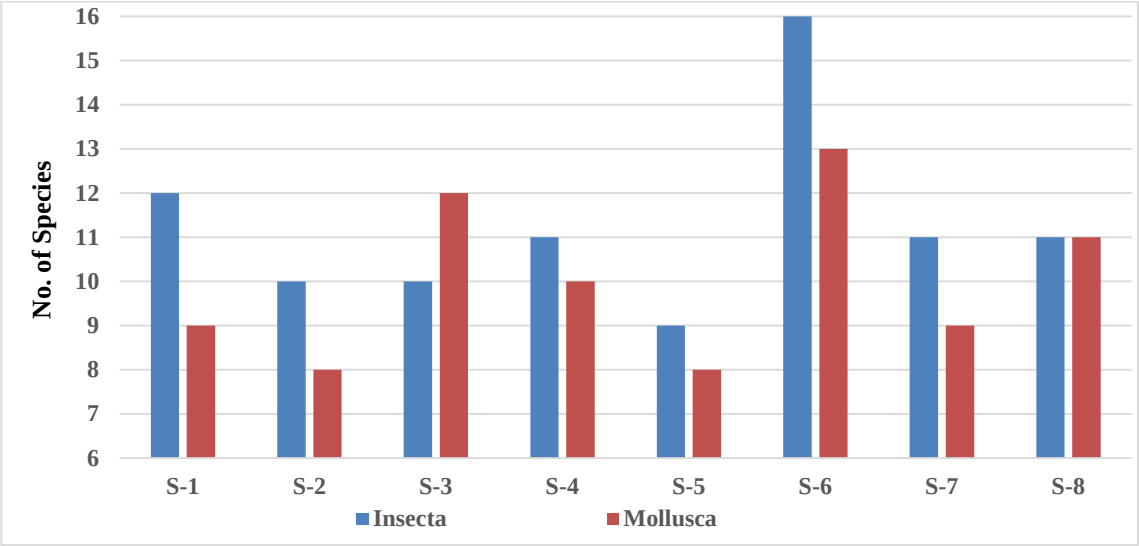

Figure 3.13: Site wise variation in macro-invertebrates in the study area (Core & Buffer zone)

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	*Agama buberculatus*	Rock Lizard	+	+	+	+	+	+	+	+	IV	LC
2	*Bufo melanostictus*	Common toad	+	+	+	+	+	+	+	+	IV	LC
3	*Bungarus caeruleus*	Common Krait	+	+	+	+	+	+	+	+	IV	LC
4	*Bungarus fasciatus*	Banded Krait	+	+	+	+	+	+	+	+	IV	LC
5	*Euphlyctis cyanophlyctis*	Indian skipper frog	+	+	+	+	+	+	+	+	IV	LC
6	*Hoplobatrachus tigerinus*	(Indian bullfrog).	+	+	+	+	+	+	+	+	IV	LC
7	*Chamelion calcarata*	Chameleon	+	+	+	+	+	+	+	+	II	LC
8	*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, Lakhisaraidistrict, 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
13	*Xenentodon cancila*	Belonidae	+					+			LC	NA
14	Pangasius buchanani	Pangasiidae	+	+	+	+	+	+		+	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, LakhisaraiDistrict, Bihar.

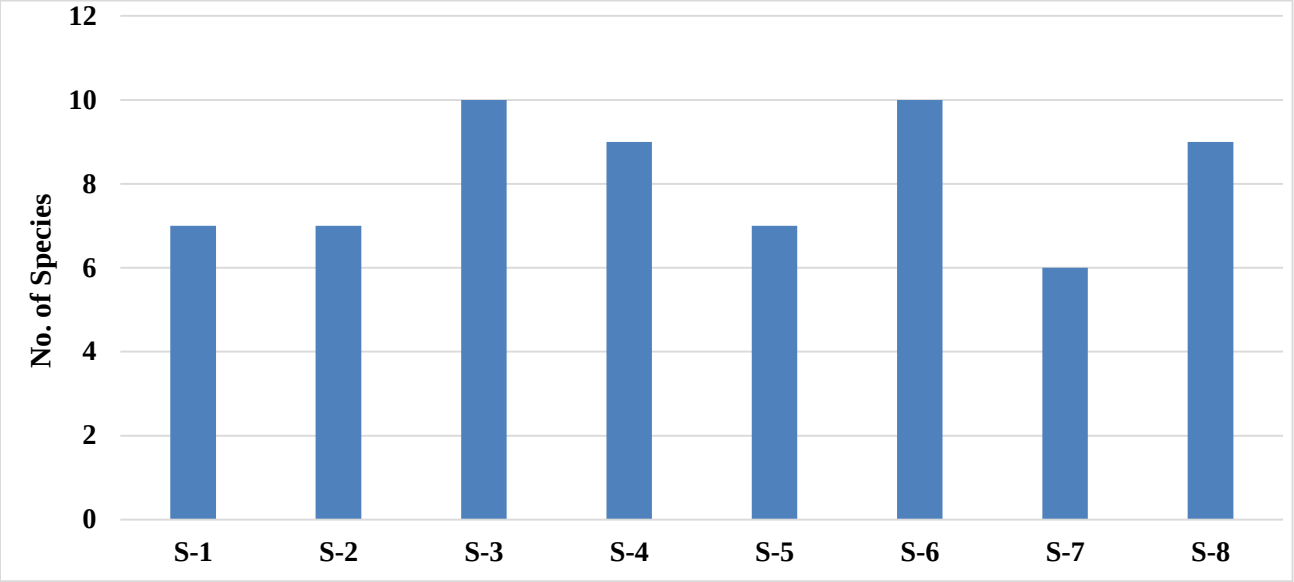

Figure 3.14: Site wise diversity variation of fishes in the study area (Core & Buffer zone)

3.6.13 Observations of Present Study (Flora & Fauna)

3.6.13.1 Flora

Most of the parts of the present study area (Lakhisaraidistrict) 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.

3.7 Socio-Economic Environment

Demography& Socio-Economic Features

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 area, Census data 2011, for 2 concerned districtsnamely Lakhisarai and Jamui of Biharstate was compiled and placed in the form of tabulation and graphical representation.

Demography of the LakhisaraiDistrict

As per the census records 2011, Lakhisaraidistrict had a population of 10, 00,912persons of which male and female were 5, 26,345and 4, 74,567respectively.Out of the total population, about 8, 57,901persons (85.7%) lived in rural part and 1, 43,011persons (14.3%) lived in urban part of the district. Decadal growth in the population of this district during 2001-11 decade has been of the order of 24.8%. The rural population in the district has increased by 25.3% while the urban population growth over the decade has been to the extent of 21.5%.

Lakhisaraidistrict has a sex ratio of 902 females to 1,000 males followed by 903 for rural and 895 for urban part of the district. Child (0-6 Yrsage) sex ratio was also recorded as 920 females per 1000 males followed by 925 for rural and 884 for urban part of the district.The district has a population density of 815 inhabitants per square kilometre (2,110/sq mi) .[6]

The literacy rate of Lakhisarai district was also recorded as 62.4% followed by 71.3% in males and 52.6% in females of the district.In 2011 Census, Lakhisaraidistrict returned 1, 53,209 persons as Scheduled Castes and 8,333 persons as Scheduled Tribes. These accounted for 15.3&0.83% of the total population of the district respectively.

Religion

The population of the Lakhisarai district during 2011 was 1,000,912. Hindus constitute 95.55 percent (956,396 persons) of the population in the district followed by Muslims 4.08 percent (40,886 persons). All other four major religious communities have almost negligible percentages.

Mother Tongue

Spoken language, which is medium of conversation, is an important attribute of population. TheCensus of India has been the richest source of language data collected and published during thesuccessive decennial censuses over a century. During 2001 census, as in the previous censuses, themother tongue as returned by each individual was collected.

The population of the Lakhisarai district during 2001 was 8, 02,225. As per distribution ofdifferent mother tongues (languages mentioned under 8th Schedule of Constitution of India) as returnedduring the 2001 Census for Lakhisarai district, Hindi, the main mother tongue of the district wasreturned by 96.4 percent (7,73,338 persons) of the population. The corresponding percentage for theUrdu, the second most prominent language spoken in Lakhisarai district, was 2.8 percent (22,789persons). Speakers of other Scheduled languages were very thin in number than the two describedabove.

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, mainly for 2 concerned districtsnamedLakhisarai&Jamui of

Bihar state respectively 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 '*SandMining Project'*, 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.

Description of Social Environment

As per the Census Records 2011, the study area has a total of 135 villagesunder two (02) districts Lakhisarai&Jamui of Bihar state. Overall study area villages are falling mainly underSeven (07 Villages) tehsils namelyLakhisarai (07 villages), Chanan* (55 villages), RamgarhChowk (16 villages), Halsi (25 villages) under Lakhisarai district and Sikandra (02 villages), Jamui (29 villages) &Lakshmipur (01 village) under Jamui district in Bihar state respectively.There are forteen (14) villages*of Lakhisarai&Jamui district* in Biharstate found as uninhabited villages in the study area.

Population Distribution within 10 km radial Study Zone

As per the Census Records 2011, the total population of 10 km study zone was recorded as 278221persons of 135villagesof Lakhisarai and JamuidistrictsofBihar state. Male-female wise total population was recorded as 144700 males (52.0%) and 133521(48.0%) females respectively.

Total number of 'Households' was observed as 46,326in the 10 km radius study zone. Scheduled Caste ('SC') population was observed as 56292persons consisting of 29077males (51.7%) and 27215 females (48.3%) in the 10km study zone. Scheduled Tribes ('ST') population was also observed as 1878 persons (0.7%) consisting of 940 males (50.1%) and 938 females (49.9%) in the 10 km study zone.The child population (0-6 Age) of the study area is recorded as 54690(19.7%) and comprising of 28080 (51.3%)males&26610 (48.7%) females respectively.

Village wise details of population distributionare given as follows in**Table 3.32 & 3.33.**

Table:3.32 Village-wise Population Distribution (10km)

Name of Village/Town	No of Households	Total Population			Child Population (0-6 Years)		
		Persons	Male	Female	Persons	Male	Female
1. District Lakhisarai, Bihar							
Dumrahi	Uninhabited Village						
Jhinaura	330	1730	869	861	380	200	180
Bihraura	486	2976	1561	1415	672	328	344
Mahsauna	915	5331	2755	2576	1040	510	530
Panghara	187	1186	612	574	239	117	122
Kharagwara	388	2502	1290	1212	571	289	282
Chamghara	339	1981	1050	931	327	162	165
LakhoChak	785	4223	2253	1970	887	452	435
Patharkatti	Uninhabited Village						
Itahara	276	1602	854	748	360	191	169
Mohanpur	88	568	297	271	115	51	64
Singh Chak	547	3331	1749	1582	823	431	392
Ramshir	483	2944	1541	1403	585	290	295
Darhishir	245	1600	805	795	332	162	170
Gulni	91	583	301	282	132	68	64
Bhuinka	170	1184	630	554	227	104	123
BannuBagaicha	362	2024	1085	939	467	241	226
Sahroi	31	200	103	97	46	21	25

Barare	238	1389	719	670	302	159	143
Dhanwo	532	3264	1688	1576	712	360	352
Bataspur	211	1398	716	682	291	146	145
Maheshpur	288	1689	914	775	314	166	148
Jankidih	636	4394	2279	2115	858	462	396
Sangrampur	1586	9143	4710	4433	1720	892	828
Bhatta	Uninhabited Village						
Mahulia	210	1449	751	698	302	163	139
ChauramanBigha	317	2041	1064	977	337	169	168
Gopalpur	588	3673	1879	1794	664	335	329
Kumadar	608	3616	1858	1758	622	307	315
Raota	506	3056	1590	1466	575	275	300
RamalBigha	228	1207	641	566	250	130	120
Bhalui	420	2773	1496	1277	534	281	253
Batta	86	449	234	215	93	52	41
Rampur	713	3936	2063	1873	777	400	377
Itaun English Kita Doem	12	57	25	32	9	3	6
Itaun	843	4731	2436	2295	924	470	454
Manpur	389	2292	1109	1183	477	229	248
TitaiChak	255	1459	767	692	279	131	148
Kharkuan	25	164	77	87	39	16	23
Harbanspur	51	261	131	130	59	32	27

Balahpur	217	1336	709	627	284	150	134
Sobhnagar	50	345	190	155	72	36	36
Kamiapur	261	1417	744	673	275	127	148
Gohri	310	2066	1047	1019	418	206	212
Agaia	49	283	146	137	56	25	31
Dharampur	222	1495	780	715	298	150	148
Janpur	Uninhabited Village						
Kalianpur	Uninhabited Village						
Athmalpur	Uninhabited Village						
Malia	417	2480	1298	1182	525	285	240
Nagardar	280	1514	815	699	300	141	159
Banauli	Uninhabited Village						
Khuttupar	336	2100	1112	988	408	209	199
Pacham	329	1996	1021	975	405	210	195
Mahadeo Nagar	46	328	183	145	60	32	28
Mohan Kundi	372	2326	1193	1133	452	230	222
Rai Kundi	31	156	82	74	33	15	18
Jagirsher Khan	Uninhabited Village						
GhosiKundi	312	2080	1107	973	467	242	225
Mananpur	347	2117	1123	994	379	214	165
Baskund	132	699	351	348	172	85	87
Kachhua	91	506	274	232	116	63	53

Sarma	825	5173	2673	2500	949	506	443
Ursanwan	Uninhabited Village						
Bartara	239	1650	842	808	379	182	197
Sondhi	285	1686	834	852	343	189	154
Narainpur	194	1230	648	582	237	126	111
Kathautia	34	220	114	106	49	23	26
Dudi	355	2203	1177	1026	439	222	217
Shahnagar	228	1526	794	732	362	176	186
Nandnawan	1464	8415	4354	4061	1505	783	722
Barui	125	892	451	441	176	79	97
SawanKherawan	230	1481	743	738	307	162	145
Gulni	774	4833	2540	2293	981	498	483
Tetarhat	1017	6265	3269	2996	1218	631	587
Nongarh	784	4830	2463	2367	981	525	456
Satsanda	769	5066	2632	2434	1111	596	515
Ramgarh	261	1478	762	716	293	149	144
Halsi	1036	6334	3280	3054	1223	624	599
Mohiuddin Nagar	621	3598	1861	1737	632	311	321
Kaini	733	4798	2480	2318	907	445	462
Kakrauri	299	1823	966	857	418	214	204
Mohia	103	637	346	291	123	68	55
Shekhpurwa	238	1433	733	700	287	149	138

Giddha	288	2132	1120	1012	448	232	216
Fatehpur	52	328	165	163	68	35	33
Manpur	189	1126	587	539	213	102	111
Mahsauni	90	672	344	328	138	72	66
Baghaur	203	1474	797	677	319	184	135
Konag	219	1293	672	621	220	118	102
Rata	329	2173	1148	1025	411	218	193
Bahranwan	301	2036	1088	948	390	201	189
Kharanwan	229	1229	638	591	223	125	98
Silwe	279	1901	967	934	433	213	220
GeruaPursanda	702	4583	2338	2245	897	457	440
Bela	Uninhabited Village						
Sibsona	446	2884	1519	1365	530	273	257
RawanBarna	44	262	133	129	61	22	39
Bazidpur	100	618	336	282	148	99	49
SaitnaSalaunja	604	4037	2125	1912	867	459	408
Harewa	161	792	402	390	190	90	100
Dira	322	2048	995	1053	423	213	210
Bardokhar	309	1937	982	955	343	175	168
2. District Jamui, Bihar							
Tal Saharsa	391	2590	1399	1191	441	237	204
Bakshanpur	24	156	87	69	24	14	10

Daulatpur	850	4661	2456	2205	810	420	390
Majhwe	841	5225	2699	2526	965	489	476
ChhatthuDhanawan	235	1535	826	709	254	128	126
Tikoi	Uninhabited Village						
LakhanDhanawan	242	1461	731	730	315	152	163
Domanpura	281	1761	927	834	263	140	123
Nabinagar	700	4250	2296	1954	786	422	364
Lakhapur	397	2483	1274	1209	528	262	266
Kakan	1309	7121	3648	3473	1342	663	679
Sonai	385	2288	1203	1085	429	244	185
Dhandh	379	2272	1207	1065	381	184	197
Lakhanpur	453	2371	1279	1092	361	185	176
Partapur	321	1786	955	831	328	189	139
Rajpura	128	815	430	385	175	91	84
Marwa	311	1817	929	888	414	219	195
Dighoi	85	681	364	317	138	84	54
SemariaBikrampur	171	1188	631	557	216	117	99
AmmaSarari	704	3631	1893	1738	759	406	353
RamalBigha	Uninhabited Village						
MisirBigha	152	964	485	479	224	111	113
Sangthu	739	3806	1970	1836	759	382	377
DeochandNawada	Uninhabited Village						

Bhagwana	204	1328	691	637	276	135	141
Jamua	Uninhabited Village						
Kundri Son KurhaHarla	1142	5734	2918	2816	1116	567	549
Chandwara	221	1357	724	633	227	115	112
Kharsari	898	4725	2441	2284	924	473	451
Ganesh Nawada	86	502	270	232	90	53	37
Mahgain	153	812	433	379	136	75	61
Harla	776	4155	2139	2016	706	362	344
TOTAL (10km)	**46326**	**278221**	**144700**	**133521**	**54690**	**28080**	**26610**

Source-Census of India, 2011

Table: 3.33 Village-wise SC & STPopulation Distribution (10km)

Name of Village/Town	**Total Population**	**Scheduled Castes**			**Scheduled Tribes**		
		Persons	**Males**	**Females**	**Persons**	**Males**	**Females**
1. District Lakhisarai, Bihar							
Dumrahi	Uninhabited Village						
Jhinaura	1730	559	277	282	0	0	0
Bihraura	2976	294	157	137	6	0	6
Mahsauna	5331	1216	608	608	10	4	6
Panghara	1186	131	67	64	0	0	0

Kharagwara	2502	24	14	10	0	0	0
Chamghara	1981	5	4	1	0	0	0
LakhoChak	4223	412	218	194	0	0	0
Patharkatti	Uninhabited Village						
Itahara	1602	246	134	112	2	2	0
Mohanpur	568	28	11	17	0	0	0
Singh Chak	3331	276	135	141	0	0	0
Ramshir	2944	466	238	228	4	4	0
Darhishir	1600	122	66	56	8	4	4
Gulni	583	351	183	168	2	1	1
Bhuinka	1184	0	0	0	0	0	0
BannuBagaicha	2024	206	105	101	0	0	0
Sahroi	200	0	0	0	0	0	0
Barare	1389	521	267	254	2	1	1
Dhanwo	3264	601	319	282	3	1	2
Bataspur	1398	53	29	24	0	0	0
Maheshpur	1689	783	421	362	0	0	0
Jankidih	4394	749	378	371	4	1	3
Sangrampur	9143	1354	711	643	19	10	9
Bhatta	Uninhabited Village						
Mahulia	1449	99	54	45	0	0	0
ChauramanBigha	2041	59	31	28	0	0	0

Gopalpur	3673	540	270	270	116	55	61
Kumadar	3616	755	384	371	332	157	175
Raota	3056	731	368	363	4	2	2
RamalBigha	1207	656	346	310	16	6	10
Bhalui	2773	388	202	186	0	0	0
Batta	449	15	9	6	0	0	0
Rampur	3936	1035	538	497	17	7	10
Itaun English Kita Doem	57	6	3	3	0	0	0
Itaun	4731	1096	552	544	4	1	3
Manpur	2292	459	212	247	12	5	7
TitaiChak	1459	408	216	192	0	0	0
Kharkuan	164	0	0	0	0	0	0
Harbanspur	261	0	0	0	0	0	0
Balahpur	1336	130	70	60	0	0	0
Sobhnagar	345	0	0	0	0	0	0
Kamiapur	1417	255	131	124	1	1	0
Gohri	2066	109	48	61	0	0	0
Agaia	283	0	0	0	0	0	0
Dharampur	1495	409	210	199	4	3	1
Janpur	Uninhabited Village						
Kalianpur	Uninhabited Village						
Athmalpur	Uninhabited Village						

Malia	2480	646	328	318	2	0	2
Nagardar	1514	0	0	0	0	0	0
Banauli	Uninhabited Village						
Khuttupar	2100	284	145	139	8	3	5
Pacham	1996	263	127	136	0	0	0
Mahadeo Nagar	328	21	10	11	0	0	0
Mohan Kundi	2326	665	327	338	5	1	4
Rai Kundi	156	69	39	30	0	0	0
Jagirsher Khan	Uninhabited Village						
GhosiKundi	2080	623	316	307	13	6	7
Mananpur	2117	490	277	213	1	1	0
Baskund	699	19	12	7	678	338	340
Kachhua	506	0	0	0	443	236	207
Sarma	5173	1291	679	612	0	0	0
Ursanwan	Uninhabited Village						
Bartara	1650	305	152	153	1	1	0
Sondhi	1686	340	174	166	4	4	0
Narainpur	1230	213	107	106	2	0	2
Kathautia	220	220	114	106	0	0	0
Dudi	2203	599	328	271	4	2	2
Shahnagar	1526	129	66	63	0	0	0
Nandnawan	8415	2455	1270	1185	14	10	4

Barui	892	59	24	35	0	0	0
SawanKherawan	1481	196	101	95	0	0	0
Gulni	4833	967	506	461	8	5	3
Tetarhat	6265	867	446	421	21	10	11
Nongarh	4830	733	380	353	11	6	5
Satsanda	5066	474	234	240	0	0	0
Ramgarh	1478	492	249	243	3	2	1
Halsi	6334	1541	811	730	6	2	4
Mohiuddin Nagar	3598	657	342	315	3	1	2
Kaini	4798	1086	570	516	9	6	3
Kakrauri	1823	224	119	105	1	1	0
Mohia	637	395	213	182	1	0	1
Shekhpurwa	1433	376	195	181	0	0	0
Giddha	2132	357	187	170	1	1	0
Fatehpur	328	140	66	74	0	0	0
Manpur	1126	394	205	189	0	0	0
Mahsauni	672	179	97	82	0	0	0
Baghaur	1474	180	101	79	0	0	0
Konag	1293	475	255	220	0	0	0
Rata	2173	467	250	217	4	2	2
Bahranwan	2036	681	365	316	2	2	0
Kharanwan	1229	299	141	158	0	0	0

Silwe	1901	261	146	115	0	0	0
GeruaPursanda	4583	743	388	355	0	0	0
Bela	Uninhabited Village						
Sibsona	2884	779	417	362	3	0	3
RawanBarna	262	0	0	0	0	0	0
Bazidpur	618	201	107	94	0	0	0
SaitnaSalaunja	4037	991	509	482	1	1	0
Harewa	792	465	227	238	0	0	0
Dira	2048	284	121	163	1	0	1
Bardokhar	1937	472	246	226	1	1	0
2. District Jamui, Bihar							
Tal Saharsa	2590	374	196	178	3	2	1
Bakshanpur	156	152	85	67	0	0	0
Daulatpur	4661	928	485	443	0	0	0
Majhwe	5225	609	301	308	0	0	0
ChhatthuDhanawan	1535	76	41	35	0	0	0
Tikoi	Uninhabited Village						
LakhanDhanawan	1461	491	235	256	3	3	0
Domanpura	1761	319	159	160	1	1	0
Nabinagar	4250	886	481	405	6	2	4
Lakhapur	2483	918	461	457	4	1	3
Kakan	7121	1933	971	962	0	0	0

Sonai	2288	725	387	338	2	1	1
Dhandh	2272	412	207	205	6	3	3
Lakhanpur	2371	408	205	203	2	1	1
Partapur	1786	292	154	138	5	5	0
Rajpura	815	147	72	75	0	0	0
Marwa	1817	612	308	304	9	5	4
Dighoi	681	0	0	0	0	0	0
SemariaBikrampur	1188	64	33	31	0	0	0
AmmaSarari	3631	657	353	304	0	0	0
RamalBigha	Uninhabited Village						
MisirBigha	964	264	127	137	1	1	0
Sangthu	3806	645	337	308	10	3	7
DeochandNawada	Uninhabited Village						
Bhagwana	1328	132	67	65	0	0	0
Jamua	Uninhabited Village						
Kundri Son KurhaHarla	5734	1845	941	904	3	1	2
Chandwara	1357	464	248	216	3	2	1
Kharsari	4725	1500	779	721	2	2	0
Ganesh Nawada	502	144	73	71	0	0	0
Mahgain	812	360	198	162	0	0	0
Harla	4155	1321	698	623	1	0	1
TOTAL (10km)	**278221**	**56292**	**2907**	**27215**	**1878**	**940**	**938**

			7				

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 902females per 1000 males in the District. The same was recorded as 923females for every 1000 males in the study area. The child (0-6 yr age) sex ratio of the study area was observed as 948 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 3.15.**

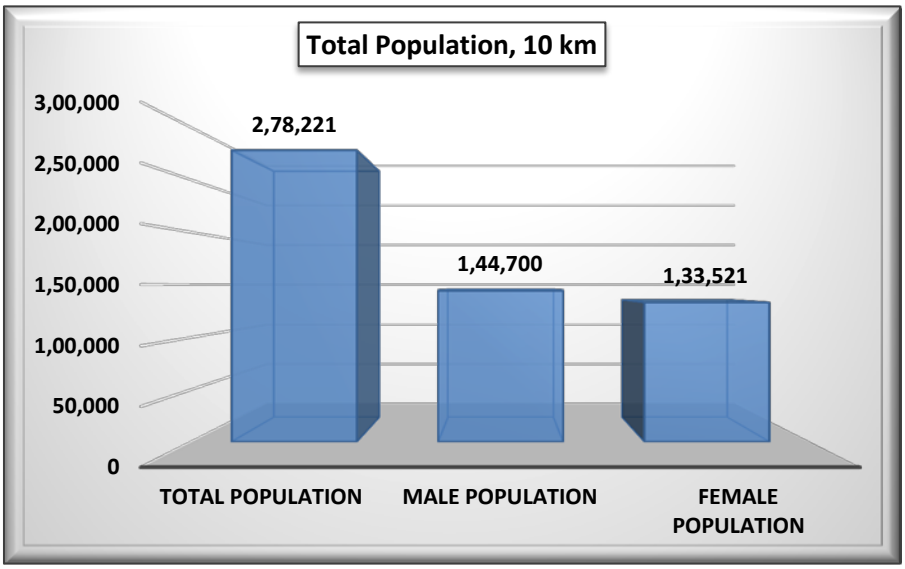

Figure 3.15 :Male-Female Wise Population Distribution

Scheduled Caste & Scheduled Tribe Population

On the basis of the village wise SC & ST population distribution of the study area during 2011, the *'Scheduled Castes'*population was observed as 56292persons consisting of 29077 males and 27215females respectively in the study area which accounts as 20.2% to the total

population (278221persons) of the study area. Scheduled Tribes ('ST') population was observed as 1878 persons,accounts as 0.7% to the total population of the study zone consisting of 940males and 938females in the 10 km radius study zone.It implies that the rest 70.1% 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 3.16 & 3.17** as follows.

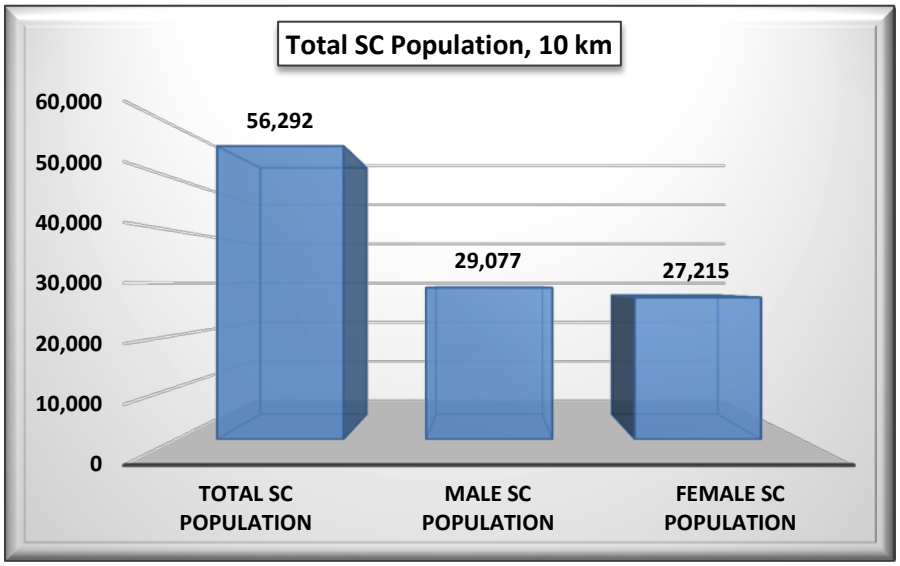

Figure 3.17 :Scheduled Caste Population in the Study Area

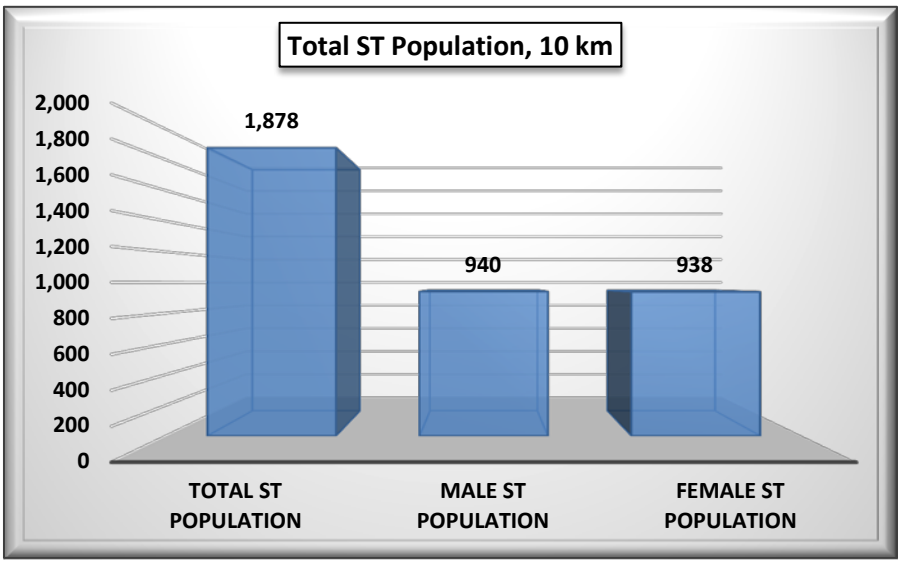

Figure: 3.17 Scheduled Tribes Population in the Study Area

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 **Table …..**.Total literate's population was recorded as130512 persons (47.0%) in the study area.**Table 3.35** reveals that Male-Female wise literates are observed as 79738&50774 persons respectively, implies that the 'Literacy Rate' is recorded as 47.0% with male-female wise percentages being 28.7% &18.3% respectively.

The Male-Female wise graphical representation of literates &illiterate's population in study area villages/town is shown in **Figure 3.18.**

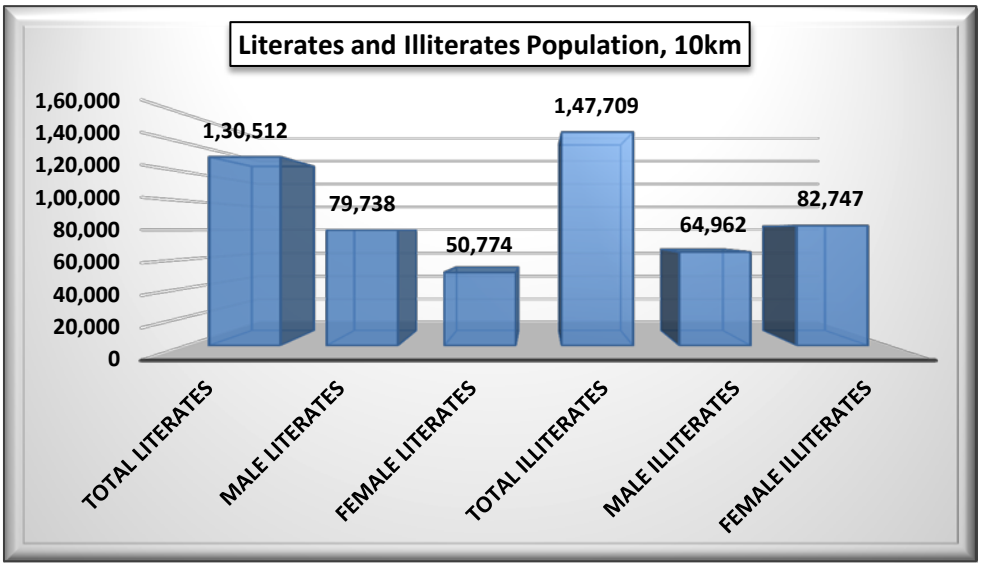

Figure 3.18 Male-Female Wise Distribution of Literates & Illiterates

Table 3.35 Male-Female Wise Literates and Illiterates(10km)

Name of Village/Town	Total Population	Literates			Illiterates		
		Persons	Males	Females	Persons	Males	Females
1. District Lakhisarai, Bihar							
Dumrahi	Uninhabited Village						
Jhinaura	1730	603	346	257	1127	523	604
Bihraura	2976	1285	792	493	1691	769	922

Mahsauna	5331	2333	1452	881	2998	1303	1695
Panghara	1186	603	373	230	583	239	344
Kharagwara	2502	888	606	282	1614	684	930
Chamghara	1981	894	602	292	1087	448	639
LakhoChak	4223	2107	1398	709	2116	855	1261
Patharkatti	Uninhabited Village						
Itahara	1602	772	493	279	830	361	469
Mohanpur	568	284	199	85	284	98	186
Singh Chak	3331	1378	887	491	1953	862	1091
Ramshir	2944	1446	913	533	1498	628	870
Darhishir	1600	586	405	181	1014	400	614
Gulni	583	268	167	101	315	134	181
Bhuinka	1184	597	401	196	587	229	358
BannuBagaicha	2024	879	612	267	1145	473	672
Sahroi	200	82	56	26	118	47	71
Barare	1389	461	254	207	928	465	463
Dhanwo	3264	1192	764	428	2072	924	1148
Bataspur	1398	663	411	252	735	305	430
Maheshpur	1689	969	591	378	720	323	397
Jankidih	4394	1596	1040	556	2798	1239	1559
Sangrampur	9143	4013	2558	1455	5130	2152	2978
Bhatta	Uninhabited Village						

Mahulia	1449	473	305	168	976	446	530
ChauramanBigha	2041	1116	699	417	925	365	560
Gopalpur	3673	1736	1035	701	1937	844	1093
Kumadar	3616	1513	994	519	2103	864	1239
Raota	3056	1348	859	489	1708	731	977
RamalBigha	1207	492	304	188	715	337	378
Bhalui	2773	1215	854	361	1558	642	916
Batta	449	232	145	87	217	89	128
Rampur	3936	2024	1230	794	1912	833	1079
Itaun English Kita Doem	57	40	19	21	17	6	11
Itaun	4731	2243	1369	874	2488	1067	1421
Manpur	2292	1110	651	459	1182	458	724
TitaiChak	1459	544	361	183	915	406	509
Kharkuan	164	57	37	20	107	40	67
Harbanspur	261	132	82	50	129	49	80
Balahpur	1336	699	433	266	637	276	361
Sobhnagar	345	102	73	29	243	117	126
Kamiapur	1417	658	439	219	759	305	454
Gohri	2066	951	591	360	1115	456	659
Agaia	283	101	75	26	182	71	111
Dharampur	1495	685	449	236	810	331	479
Janpur	Uninhabited Village						

Kalianpur	Uninhabited Village						
Athmalpur	Uninhabited Village						
Malia	2480	994	617	377	1486	681	805
Nagardar	1514	528	362	166	986	453	533
Banauli	Uninhabited Village						
Khuttupar	2100	1053	680	373	1047	432	615
Pacham	1996	776	491	285	1220	530	690
Mahadeo Nagar	328	178	118	60	150	65	85
Mohan Kundi	2326	851	520	331	1475	673	802
Rai Kundi	156	25	14	11	131	68	63
Jagirsher Khan	Uninhabited Village						
GhosiKundi	2080	746	496	250	1334	611	723
Mananpur	2117	759	462	297	1358	661	697
Baskund	699	52	31	21	647	320	327
Kachhua	506	41	27	14	465	247	218
Sarma	5173	3013	1666	1347	2160	1007	1153
Ursanwan	Uninhabited Village						
Bartara	1650	649	408	241	1001	434	567
Sondhi	1686	824	449	375	862	385	477
Narainpur	1230	727	441	286	503	207	296
Kathautia	220	114	68	46	106	46	60
Dudi	2203	1090	710	380	1113	467	646

Shahnagar	1526	558	360	198	968	434	534
Nandnawan	8415	4547	2556	1991	3868	1798	2070
Barui	892	337	210	127	555	241	314
SawanKherawan	1481	846	460	386	635	283	352
Gulni	4833	2525	1531	994	2308	1009	1299
Tetarhat	6265	3344	1972	1372	2921	1297	1624
Nongarh	4830	2208	1241	967	2622	1222	1400
Satsanda	5066	2355	1394	961	2711	1238	1473
Ramgarh	1478	851	492	359	627	270	357
Halsi	6334	2864	1683	1181	3470	1597	1873
Mohiuddin Nagar	3598	1656	1047	609	1942	814	1128
Kaini	4798	2463	1524	939	2335	956	1379
Kakrauri	1823	811	542	269	1012	424	588
Mohia	637	315	206	109	322	140	182
Shekhpurwa	1433	594	389	205	839	344	495
Giddha	2132	1130	700	430	1002	420	582
Fatehpur	328	170	102	68	158	63	95
Manpur	1126	566	361	205	560	226	334
Mahsauni	672	396	202	194	276	142	134
Baghaur	1474	734	435	299	740	362	378
Konag	1293	792	393	399	501	279	222
Rata	2173	909	577	332	1264	571	693

Bahranwan	2036	868	491	377	1168	597	571
Kharanwan	1229	706	401	305	523	237	286
Silwe	1901	786	503	283	1115	464	651
GeruaPursanda	4583	1842	1056	786	2741	1282	1459
Bela	Uninhabited Village						
Sibsona	2884	1307	828	479	1577	691	886
RawanBarna	262	18	10	8	244	123	121
Bazidpur	618	242	140	102	376	196	180
SaitnaSalaunja	4037	1604	977	627	2433	1148	1285
Harewa	792	275	175	100	517	227	290
Dira	2048	1063	574	489	985	421	564
Bardokhar	1937	1013	615	398	924	367	557
2. District Jamui, Bihar							
Tal Saharsa	2590	1293	838	455	1297	561	736
Bakshanpur	156	100	66	34	56	21	35
Daulatpur	4661	2443	1493	950	2218	963	1255
Majhwe	5225	2078	1265	813	3147	1434	1713
ChhatthuDhanawan	1535	855	571	284	680	255	425
Tikoi	Uninhabited Village						
LakhanDhanawan	1461	592	367	225	869	364	505
Domanpura	1761	685	436	249	1076	491	585
Nabinagar	4250	2295	1400	895	1955	896	1059

Lakhapur	2483	1037	635	402	1446	639	807
Kakan	7121	3227	1919	1308	3894	1729	2165
Sonai	2288	1016	590	426	1272	613	659
Dhandh	2272	1237	767	470	1035	440	595
Lakhanpur	2371	1423	915	508	948	364	584
Partapur	1786	944	576	368	842	379	463
Rajpura	815	301	199	102	514	231	283
Marwa	1817	691	425	266	1126	504	622
Dighoi	681	325	211	114	356	153	203
SemariaBikrampur	1188	618	419	199	570	212	358
AmmaSarari	3631	1918	1139	779	1713	754	959
RamalBigha	Uninhabited Village						
MisirBigha	964	347	230	117	617	255	362
Sangthu	3806	2102	1196	906	1704	774	930
DeochandNawada	Uninhabited Village						
Bhagwana	1328	619	434	185	709	257	452
Jamua	Uninhabited Village						
Kundri Son KurhaHarla	5734	3226	1846	1380	2508	1072	1436
Chandwara	1357	870	499	371	487	225	262
Kharsari	4725	2490	1333	1157	2235	1108	1127
Ganesh Nawada	502	308	177	131	194	93	101
Mahgain	812	423	248	175	389	185	204

Harla	4155	2564	1513	1051	1591	626	965
TOTAL (10km)	**278221**	**130512**	**79738**	**50774**	**147709**	**64962**	**82747**

Source-Census of India, 2011

Economic Profile of the District:

In 2006 the Ministry of Panchayati Raj named Lakhisarai one of the country's 250 districts (out of a total of 640).[2] It is one of the 36 districts in Bihar currently receiving funds from the Backward Regions Grant Fund Programme (BRGF).[2]

Industrial background; there are various fertilizer and pesticide factories in the district, including Bihar Mineral Industries. The market for fabrics in the district also flourishes with many old and new shops, and there are many factories like Sindur.

National Thermal Power Corporation Limited and Bihar State Power Generation Company Ltd has signed Memorandum of Understanding to set up 1320MW thermal power plant in Kajra.[3]

Trade and Commerce –The development of the means of communication has had a great impact on the trade and commerce of the district. The district may now be said to be fairly well- connected by Road and Rail. Lakhisarai is hub of the trade and commerce in the district. Important items produced are Rice, Wheat and Maize. Banarasi Sari, Silk, Kaleen, Dari and Agricultural products are the main articles, which are traded in and out of the district.

Workers Scenario:

Occupational studied to assess the skills of people in the study area. Occupational pattern helps in identifying major economic activities of the area. In the study area the Main and Marginal Workers population was observed as 51034(18.0%) and 47122(17.0%) to the total population (278221), while the remaining 180065(65.0%) persons were recorded as non-workers. Thus it implies that the semi-skilled and non-skilled work-force required in study area 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 …….**

Table 3.36 : Village-wise Occupational Pattern (10km)

Name of the Village	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
1. District Lakhisarai, Bihar										
Dumrahi	Uninhabited Village									
Jhinaura	461	146	220	8	87	64	9	48	0	7
Bihraura	692	285	355	10	42	357	26	310	5	16
Mahsauna	991	228	441	37	285	510	48	354	11	97
Panghara	119	96	9	1	13	218	102	105	1	10
Kharagwara	623	504	96	4	19	154	22	123	6	3
Chamghara	516	450	51	0	15	114	24	68	14	8
LakhoChak	607	225	218	0	164	388	14	351	0	23
Patharkatti	Uninhabited Village									
Itahara	52	7	5	1	39	372	38	268	9	57

Mohanpur	125	30	73	9	13	23	0	7	4	12
Singh Chak	488	284	164	3	37	672	259	402	3	8
Ramshir	826	434	236	38	118	496	30	394	16	56
Darhishir	182	160	18	0	4	211	116	93	0	2
Gulni	51	43	0	0	8	244	43	200	0	1
Bhuinka	219	153	2	2	62	251	97	126	1	27
BannuBagaicha	441	234	92	17	98	375	157	209	1	8
Sahroi	20	18	1	0	1	18	0	18	0	0
Barare	246	94	133	6	13	144	13	13	44	74
Dhanwo	296	61	121	17	97	665	16	519	50	80
Bataspur	266	130	90	0	46	72	22	33	0	17
Maheshpur	320	98	186	1	35	487	78	380	3	26
Jankidih	922	387	284	14	237	722	219	341	103	59

Sangrampur	1567	516	788	16	247	1479	215	1047	101	116
Bhatta	Uninhabited Village									
Mahulia	306	283	20	2	1	28	23	0	1	4
ChauramanBigha	383	167	88	35	93	215	145	55	0	15
Gopalpur	366	118	146	7	95	764	290	403	4	67
Kumadar	353	93	193	21	46	686	118	557	3	8
Raota	638	9	562	7	60	919	406	469	7	37
RamalBigha	374	102	259	3	10	19	11	3	0	5
Bhalui	786	331	410	18	27	41	6	30	2	3
Batta	113	71	38	0	4	5	0	5	0	0
Rampur	983	277	544	20	142	568	417	123	8	20
Itaun English Kita Doem	8	0	2	0	6	11	0	7	0	4

Itaun	961	168	566	24	203	404	11	343	2	48
Manpur	333	72	180	4	77	654	30	569	9	46
TitaiChak	256	120	99	1	36	142	16	88	2	36
Kharkuan	40	5	28	0	7	5	0	1	0	4
Harbanspur	96	36	5	2	53	12	0	1	0	11
Balahpur	53	0	49	0	4	310	1	307	0	2
Sobhnagar	9	0	0	0	9	126	0	123	0	3
Kamiapur	312	20	269	0	23	261	6	241	0	14
Gohri	422	125	218	19	60	272	10	262	0	0
Agaia	79	0	77	0	2	57	0	56	0	1
Dharampur	36	3	13	1	19	404	34	351	2	17
Janpur	Uninhabited Village									
Kalianpur	Uninhabited Village									

Athmalpur	Uninhabited Village									
Malia	511	269	219	2	21	223	5	202	1	15
Nagardar	329	163	156	2	8	54	4	48	0	2
Banauli	Uninhabited Village									
Khuttupar	154	18	94	0	42	577	20	533	4	20
Pacham	271	130	58	9	74	156	4	147	0	5
Mahadeo Nagar	74	24	0	6	44	66	38	25	0	3
Mohan Kundi	377	142	193	3	39	315	59	250	2	4
Rai Kundi	56	0	55	0	1	24	0	24	0	0
JagirsherKhan	Uninhabited Village									
GhosiKundi	359	48	300	1	10	161	20	135	2	4
Mananpur	792	407	332	13	40	234	64	129	31	10
Baskund	341	0	341	0	0	0	0	0	0	0

Kachhua	125	123	0	0	2	0	0	0	0	0
Sarma	965	662	224	16	63	672	107	540	20	5
Ursanwan	Uninhabited Village									
Bartara	261	253	1	0	7	256	3	253	0	0
Sondhi	194	138	29	0	27	395	4	368	7	16
Narainpur	270	158	85	0	27	57	4	45	4	4
Kathautia	2	0	0	0	2	78	0	74	1	3
Dudi	665	147	349	1	168	72	16	45	0	11
Shahnagar	446	93	311	2	40	133	31	100	0	2
Nandnawan	1458	514	696	9	239	1167	95	855	28	189
Barui	102	63	27	2	10	44	5	24	6	9
SawanKherawan	171	101	46	5	19	438	185	250	2	1
Gulni	510	264	149	6	91	1268	21	1207	5	35

Tetarhat	698	273	191	34	200	1227	157	722	71	277
Nongarh	929	510	350	6	63	753	92	572	31	58
Satsanda	757	277	417	8	55	931	119	708	5	99
Ramgarh	82	27	16	0	39	404	12	358	6	28
Halsi	1002	379	379	59	185	1499	108	1317	8	66
Mohiuddin Nagar	1130	496	587	5	42	255	13	236	5	1
Kaini	1036	458	469	17	92	647	37	557	26	27
Kakrauri	139	17	73	3	46	344	144	118	27	55
Mohia	15	0	6	3	6	263	0	128	128	7
Shekhpurwa	475	228	234	5	8	15	10	5	0	0
Giddha	309	280	16	2	11	352	46	303	0	3
Fatehpur	65	54	11	0	0	9	3	2	0	4
Manpur	303	128	157	0	18	40	1	38	0	1

Mahsauni	10	0	6	0	4	232	117	113	2	0
Baghaur	435	150	267	0	18	112	6	105	0	1
Konag	453	138	281	2	32	10	1	2	0	7
Rata	480	349	107	4	20	321	225	76	1	19
Bahranwan	500	0	485	0	15	473	84	378	1	10
Kharanwan	378	146	188	4	40	9	0	5	0	4
Silwe	571	154	373	4	40	285	33	251	0	1
GeruaPursanda	1215	654	442	18	101	624	83	498	3	40
Bela	Uninhabited Village									
Sibsona	150	54	64	2	30	1103	31	726	23	323
RawanBarna	8	8	0	0	0	39	38	0	0	1
Bazidpur	71	65	1	0	5	156	27	109	0	20
SaitnaSalaunja	611	201	219	1	190	1108	22	1021	25	40

Harewa	193	9	169	3	12	131	7	112	1	11
Dira	403	225	137	5	36	330	147	137	22	24
Bardokhar	270	120	134	2	14	605	28	558	0	19
2. District Jamui, Bihar										
Tal Saharsa	619	106	361	16	136	577	31	513	27	6
Bakshanpur	36	3	27	2	4	41	1	33	0	7
Daulatpur	917	88	199	80	550	519	56	368	25	70
Majhwe	513	195	197	15	106	1186	184	755	13	234
ChhatthuDhanawan	403	12	337	3	51	202	16	108	2	76
Tikoi	Uninhabited Village									
LakhanDhanawan	162	143	10	4	5	326	75	246	3	2
Domanpura	111	49	38	5	19	711	65	633	7	6

Nabinagar	1189	398	590	27	174	525	117	331	17	60
Lakhapur	300	258	12	1	29	473	45	426	1	1
Kakan	1324	218	979	13	114	1474	122	683	90	579
Sonai	579	55	383	23	118	286	14	207	4	61
Dhandh	444	64	319	2	59	252	47	164	6	35
Lakhanpur	546	209	237	1	99	215	39	161	3	12
Partapur	282	39	146	3	94	243	4	231	0	8
Rajpura	106	4	56	5	41	125	0	112	1	12
Marwa	540	67	431	9	33	48	5	21	3	19
Dighoi	46	0	35	0	11	122	3	117	0	2
SemariaBikrampur	263	131	93	3	36	271	15	142	85	29
AmmaSarari	79	34	6	3	36	1408	102	1237	35	34
RamalBigha	Uninhabited Village									

MisirBigha	291	1	283	1	6	38	3	35	0	0
Sangthu	807	412	274	4	117	913	238	621	4	50
DeochandNawada	Uninhabited Village									
Bhagwana	55	50	3	0	2	521	32	480	0	9
Jamua	Uninhabited Village									
Kundri Son KurhaHarla	809	330	370	35	74	1686	225	1426	8	27
Chandwara	172	161	6	0	5	325	15	260	13	37
Kharsari	1054	312	682	3	57	1046	172	820	4	50
Ganesh Nawada	12	4	1	0	7	155	70	84	0	1
Mahgain	373	41	303	6	23	34	4	28	2	0
Harla	944	185	656	8	95	794	18	569	7	200
TOTAL (10km)	**51034**	**19269**	**23827**	**884**	**7054**	**47122**	**7066**	**34623**	**1270**	**4163**

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 workers**

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 ….**as follows;

Table 3.37: Distribution of Work Participation Rate(10km)

Occupation Class	**Year, 2011**
Main Workers	**51034 (18.0%)**
Male	40072(78.5%)
Female	10962(21.5%)
Marginal Workers	**47122(17.0%)**
Male	26893(57.0%)
Female	20229(43.0%)
Non-Workers	**18865(65.0%)**
Male	77735 (43.2%)
Female	102330(56.8%)
Total Population (10km)	**278221**
Source: Census of India Records, 2011	

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

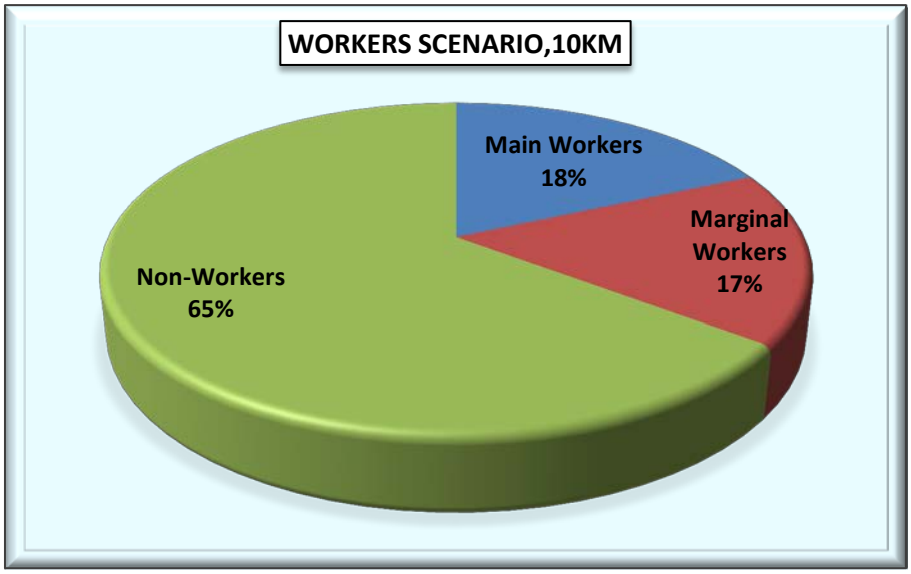

Figure: 3.19 Workers Scenario of Study Area

Composition of Main Workers:

The 'Main Workers' were observed as 51034persons (18.0%) to the total population (278221) of the study area and its composition is made-up of Casual laborers as 19269 (38.0%), Agricultural laborers as 23827(46.0%), Household workers 884(2.0%) and other workers as 7054(14.0%) respectively.

Composition of Main workers is shown below as **Figure 3.20**

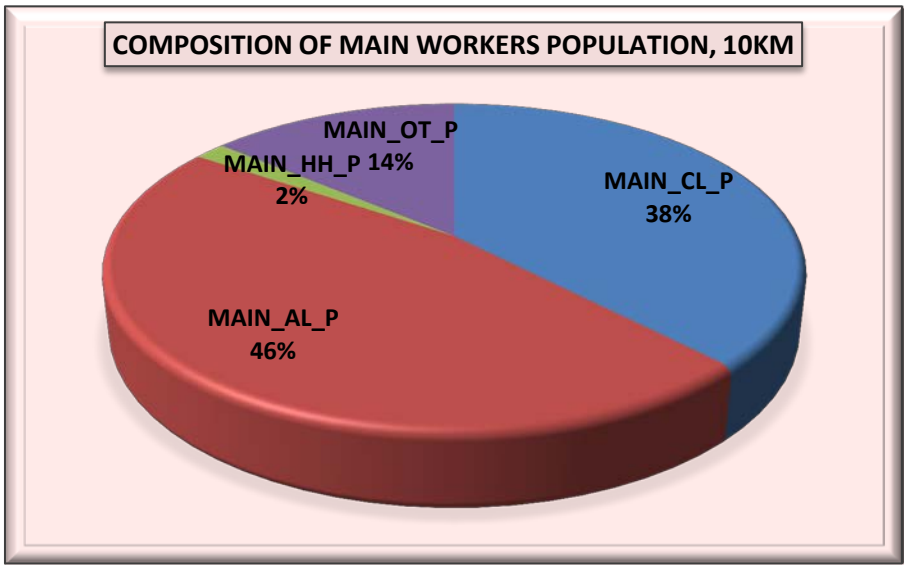

Figure:Composition of Main Workers Population

Composition of Marginal Workers:

The total marginal workers are observed as 47122 which constitute 17.0% to the total population (278221) comprise of Marginal Casual Laborers as 7066 (15.0%), Marginal Agricultural Laborers as 34623(73.0%), Marginal Household laborers as 1270 (3.0%) and marginal other workers were also observed as 4163 (9.0%) of the total marginal workers respectively.

Details about marginal workers in the study area are tabulated in**Table 3.38**. Composition of Marginal workers is shown in**Figure 3.21** as follows.

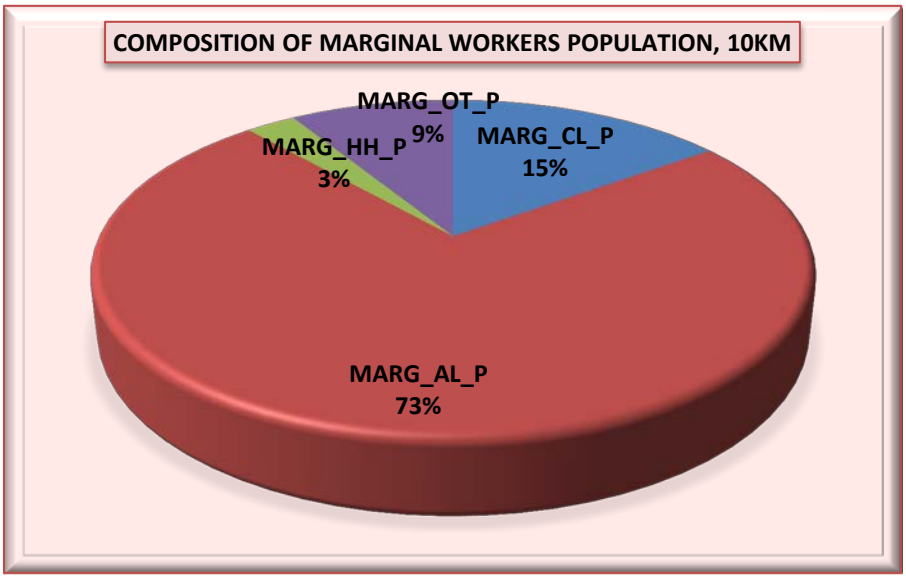

Figure: 3.21 Composition of Marginal Workers

Composition of Non-Workers:

The total Non-worker's population was observed as 180065which accounts65.0% to the total population (278221) of the study area. Male-female wise Non-worker's population was recorded as 77735 Males (43.2%) and 102330Females (56.8%) respectively.

Details about Total Non-workers in the study area are compiled in**Table 3.39** Graphical representation of Non-worker's population is shown as follows in**Figure 3.22**

Table 3.39 :Composition of Non-Workers

Non-Workers Population		
Persons	**Males**	**Females**

180065	77735 (43.2%)	102330(56.8%)

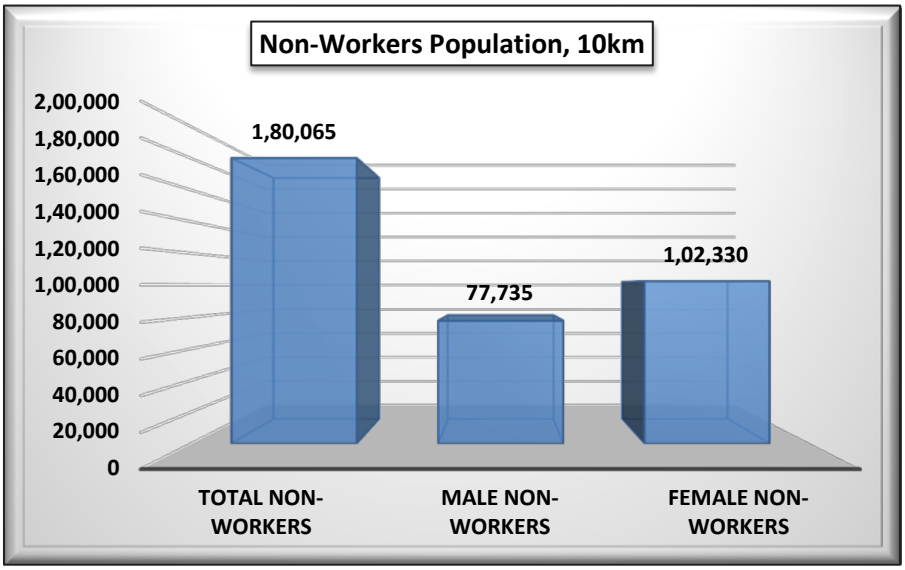

Figure: 3.22 Compositions of Non-Workers

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 study area inhabited villages of Lakhisarai and JamuiDistricts in Bihar state.The study area has average level of basic infrastructure facilities like educational, medical, potable water and power supply and transport& communication network.

As per the Census Records 2011, the study area has a total of 135 villages under two (02) districts Lakhisarai&Jamui of Bihar state. Overall study area villages are falling mainly under Seven (07 Villages) tehsils namely Lakhisarai (07 villages), Chanan* (55 villages), RamgarhChowk (16 villages), Halsi (25 villages) under Lakhisarai district and Sikandra (02 villages), Jamui (29 villages) &Lakshmipur (01 village) under Jamui district in Bihar state respectively. There are Sixteen (16) villages *of Lakhisarai&Jamui district* in Bihar state found as uninhabited villages in the study area.

Educational Facilities

There isa total no. of164 Primary schools existing in the 10km radius study area.Seventy-five (75) no of Middle schools are foundin the study area. Only sixteen (16)Higher Secondary School (SS) andNine (09)Senior Secondary School (SSS) facility is available in the study

area. 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.No town was found in the 10 km radial study area.

Availability of University Education in the Lakhisarai District

There are several affiliated and constituted colleges of the TilkaManjhi University, Bhagalpur which impart under graduate and post graduate education in the district. IGNOU (Indira Gandhi National Open University) has opened special study center in MahilaMahavidyalaya, Barahiya of the district where one can study many distance courses of under graduate, post graduate and vocational etc. Nalanda Open University has also opened study center in K.S.S College of the district.

Medical Facilities

The medical facilities are provided by different agencies like Govt. & Private individuals and voluntary organizations in the study area. As per the census 2011, only Ten(10) primary health centersexistsin the study area; most of the study area villages depend upon the towns & district HQ of the study area having such facility. No community health centre exists in the study area. Only twenty-seven (27)Primary Health Sub-Centers exists in the villages of the study area. Only twenty-five(25) no of Mother & Child Welfare Centersarefound in the study area. Noallopathic hospitalexists in the study area andseven (07)Dispensaries exist in the study area. Only twenty-five (25) Family Welfare Centersare found in the study area. Overall study area villages are served by average medical facilities. Specialized medical facilities are available only in towns and District Headquarter (HQ) only.

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. Out of the total 135 villages,only50 villages (37.0%)are served with River/Canal water in the study area. As per the census records 2011, about33(24.4%) villagesare being served with Tank/Pond/Lake as potable water facility in the study area.

Communication, Road & Transport Facilities

Apart from Post &Telegraph Office (PTO) services, transport is the main communication linkage in the study area. Compiled census 2011, data shows that the study area has good postal facilities in the 10km radius zone. About 37 villages(27.4%) were foundserving with Post Office facilities in the study area, remaining villages are depending upon towns of the study area. The study area has average rail and road network, passes from the area.

Only 14villageswere found with railway station facility in the study area.Nearest railway station is Lakhisarai Railway station, situated toward Northeast direction from the mine lease area site. Nearest town is Lakhisarai, situated in Northwest direction. Nearest State Highway (SH-18) is passing towards West Direction.Nearest airport is Jayprakash Narayan International Airport, in Bihar state, situated at >120 km in NW direction from the mine lease area site.

Roads - The district of Lakhisarai is well served by a network of roads. Road communication is the main mode of transportation in this district. The roads are classified as the National Highways, State Highways, Major district roads and other district roads. They are maintained by the Public Works Department, the Rural Engineering Organisation, the ZilaParishad and Municipalities. It is also connected with the interior of the district by metalled road. SH-6 and SH-18 also pass through the district.

Railways - The district of Lakhisarai has a railway communication system. It is served by East Central Railway. A branch rail line is running from Kiul to Gaya. Lakhisarai is connected to Jamalpur by loop line.

Airway - Airways facilities are not available in the district.

Boats – Waterways facilities are not available in the district.

Banking Facility

The study area has almost all the schedule commercial banks with ATM facility at urban areas and the district HQ.

Power Supply

It is revealed from the compiled information on amenities availability as per the census record of 2011; most of the villages and towns are electrified for Domestic, Agriculture, and

Commercial& for allpurposes. About eighty-seven (87) villages (64.4%) and towns of the study area are electrified for domestic purpose, only 35villages (26.0%) for agricultural purpose, 23 (17.0%) villages for commercial purpose and only 31villages (23.0%) for all purposes in the study area.Out of 135 villages in the study area, 50villages (37.0%) including 14uninhabited villages (10.4%)are not electrified for any purpose in the study area.

The district receives its entire power supply from Bihar State Electricity Board. All the towns of Lakhisarai district have electricity. In the rural areas, the Government is trying to extend electric line to the maximum number of villages by implementing various schemes for rural electrification. 279 Villages of the district are electrified.

Village/town wise Basic Infrastructure and Amenities availabilities data for the entire study area is compiled and presented in**Table.3.40** as follows;

Table 3.40 : Village wise Basic Amenities Availability

Name of the Village/Town	Educational				Medical							Drinking Water				CT	Communication & Transport				Approach to the Village				Power Supply				Nearest Town & Distance, km
	P	P	SS	SSS	CHC	PHC	PHSC	MCWC	H	D	FWC	HP	TW	R	Tk		PO	PTO	BS	RS	PR	KR	NW	FP	ED	EAg.	EC	EA	
1. District Lakhisarai, Bihar																													
Dumrahi	Uninhabited Village																												Lakhisarai
Jhinaura	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	2	1	1	2	1	2	2	2	2	Lakhisarai,7km
Bihraura	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	1	1	1	2	1	1	1	1	1	Lakhisarai,3km
Mahsauna	1	1	0	0	0	0	0	0	0	0	0	1	1	1	2	2	1	2	2	2	1	1	2	1	1	1	1	1	Lakhisarai,3km
Panghara	1	0	0	0	0	0	0	0	0	0	0	1	2	1	1	2	2	2	2	2	1	1	2	1	1	1	2	2	Lakhisarai,3km
Kharagwara	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	2	1	1	2	1	1	1	2	2	Lakhisarai,3km

chamghara	1	1	0	0	0	0	0	0	0	0	0	1	2	1	1	2	2	2	2	2	1	1	2	1	1	1	2	2	Lakhisarai,5km
LakhoChak	1	1	1	1	0	0	0	0	0	0	0	1	1	1	2	2	2	2	2	1	1	1	2	1	1	1	2	2	Lakhisarai,10km
Patharkatti	Uninhabited Village																												Lakhisarai
Itahara	1	1	0	0	0	0	1	1	0	0	1	1	2	2	2	2	2	2	2	2	1	2	2	1	1	2	2	2	Lakhisarai,15km
Mohanpur	1	0	0	0	0	0	0	0	0	0	0	1	2	1	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,12km
Singh Chak	2	1	0	0	0	0	0	0	0	0	0	1	2	1	2	2	1	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,12km
Ramshir	1	1	0	0	0	0	0	0	0	0	0	1	2	1	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,13km
Darhishir	1	1	1	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,15km
Gulni	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,14km

Bhuinka	1	1	0	0	0	0	0	0	0	0	0	1	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	Lakhisarai,10km
BannuBagaicha	1	1	0	0	0	0	1	1	0	0	1	1	2	1	2	2	1	2	2	2	1	2	2	1	1	2	2	2	Lakhisarai,15km
Sahroi	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	Lakhisarai,14km
Barare	2	1	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,16km
Dhanwo	2	2	0	0	0	0	0	0	0	0	0	1	2	2	2	2	1	2	1	2	1	1	2	1	1	2	2	2	Lakhisarai,16km
Bataspur	2	0	0	0	0	0	0	0	0	0	0	1	2	1	1	2	2	2	1	2	1	1	2	1	1	2	2	2	Lakhisarai,18km
Maheshpur	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	2	2	1	1	2	2	2	Lakhisarai,22km
Jankidih	2	1	0	0	0	0	0	0	0	0	0	1	2	1	1	2	1	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,15km

Sangrampur	1	1	0	0	0	0	0	0	0	0	0	1	2	1	2	2	1	2	2	2	1	1	2	1	2	2	2	2	Lakhisarai,25km
Bhatta	Uninhabited Village																												Lakhisarai
Mahulia	1	1	1	0	0	0	0	0	0	0	0	1	2	2	2	2	1	2	2	1	1	1	2	1	2	2	2	2	Lakhisarai,30km
ChauramanBigha	1	1	0	0	0	0	0	0	0	0	0	1	2	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Lakhisarai,30km
Gopalpur	4	1	0	0	0	0	0	0	0	0	0	1	2	1	2	2	1	2	2	1	1	1	2	1	2	2	2	2	Lakhisarai,29km
Kumadar	1	1	0	0	0	0	0	0	0	0	0	1	2	1	2	2	2	2	2	1	1	1	2	1	2	2	2	2	Lakhisarai,30km
Raota	1	1	1	0	0	0	1	1	0	0	1	1	2	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Lakhisarai,27km
RamalBigha	3	1	1	0	0	0	0	0	0	0	0	1	2	2	2	2	1	2	2	1	1	1	2	1	2	2	2	2	Lakhisarai,30km
Bhalui	1	1	1	0	0	0	0	0	0	0	0	1	2	2	2	2	1	2	2	1	1	1	2	1	2	2	2	2	Lakhisarai,30k

																													m
Batta	1	0	0	0	0	1	1	1	0	0	1	1	2	1	1	2	2	2	2	1	2	1	2	1	1	2	2	2	Lakhisarai,25km
Rampur	2	1	1	0	0	0	0	0	0	0	0	1	2	1	1	2	1	2	1	1	1	1	2	1	1	2	2	2	Lakhisarai,27km
Itaun English Kita Doem	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	1	1	1	1	2	1	2	1	2	2	2	2	Lakhisarai,25km
Itaun	1	1	0	0	0	0	0	0	0	0	0	1	2	2	1	1	2	2	2	1	1	1	2	1	1	2	2	2	Lakhisarai,25km
Manpur	1	1	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,25km
TitaiChak	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	2	2	1	1	2	2	2	Lakhisarai,26km
Kharkuan	1	0	0	0	0	0	0	0	0	0	0	1	2	1	1	2	2	2	1	2	1	1	2	1	1	2	2	2	Lakhisarai,16km
Harbanspur	1	1	0	0	0	0	0	0	0	0	0	1	2	1	1	2	2	2	1	2	1	1	2	1	1	2	2	2	Lakhisarai,16km

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Balahpur	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,14km
Sobhnagar	1	1	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,16km
Kamiapur	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,16km
Gohri	1	1	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	1	1	1	2	1	1	2	2	2	Lakhisarai,15km
Agaia	1	0	0	0	0	0	0	0	0	0	0	1	2	1	2	2	2	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,16km
Dharampur	1	1	0	0	0	0	0	0	0	0	0	1	2	1	2	2	2	2	2	2	1	2	2	1	2	2	2	2	Lakhisarai,27km
Janpur	Uninhabited Village																											Lakhisarai
Kalianpur	Uninhabited Village																											Lakhisarai

Athmalpur	Uninhabited Village																												Lakhisarai
Malia	2	1	0	0	0	0	0	0	0	0	0	1	2	2	2	2	1	2	2	2	1	2	2	1	2	2	2	2	Lakhisarai,25km
Nagardar	1	1	0	0	0	0	0	0	0	0	0	1	2	2	2	2	1	2	2	2	1	1	2	1	2	2	2	2	Lakhisarai,25km
Banauli	Uninhabited Village																												Lakhisarai
Khuttupar	1	1	0	0	0	0	0	0	0	0	0	1	1	2	2	2	1	2	2	2	2	2	2	1	1	1	1	1	Lakhisarai,17km
Pacham	2	1	0	0	0	0	1	1	0	0	1	1	2	1	2	2	1	2	2	1	2	1	2	1	1	1	1	1	Lakhisarai,12km
Mahadeo Nagar	0	0	0	0	0	0	0	0	0	0	0	1	2	1	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Lakhisarai,17km
Mohan Kundi	4	0	0	0	0	0	0	0	0	0	0	1	2	1	2	2	2	2	2	2	2	1	2	1	1	1	1	1	Lakhisarai,10km
Rai Kundi	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	Lakhisarai,17km

Jagirsher Khan	Uninhabited Village																												Lakhisarai
GhosiKundi	2	1	0	0	0	0	0	0	0	0	0	1	1	2	2	1	2	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,4km
Mananpur	2	2	2	0	0	0	0	0	0	0	0	1	1	2	2	2	1	2	2	1	1	1	2	1	2	2	2	2	Lakhisarai,30km
Baskund	1	1	0	0	0	0	0	0	0	0	0	1	2	2	2	2	1	2	2	2	2	1	2	1	2	2	2	2	Lakhisarai,30km
Kachhua	2	0	0	0	0	0	0	0	0	0	0	1	2	1	1	2	2	2	2	2	1	1	2	1	2	2	2	2	Lakhisarai,30km
Sarma	2	1	1	1	0	0	0	0	0	0	0	1	1	2	1	2	1	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,9km
Ursanwan	Uninhabited Village																												Lakhisarai
Bartara	2	0	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,7km
Sondhi	1	1	0	0	0	0	0	0	0	0	0	1	1	2	1	2	2	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,8km
Narainpur	1	1	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,5km
Kathautia	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Lakhisarai,13km

Dudi	2	1	0	0	0	0	0	0	0	0	0	1	1	2	1	2	2	2	1	2	1	1	2	1	1	2	2	2	Lakhisarai,7km
Shahnagar	1	1	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisaraim,11 km
Nandnawan	4	1	0	0	0	0	1	1	0	0	1	1	1	2	1	2	1	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,12k m
Barui	1	0	0	0	0	0	0	0	0	0	0	1	1	2	1	2	2	2	2	2	2	1	2	1	2	2	2	2	Lakhisarai,14k m
SawanKherawan	1	1	0	1	0	0	0	0	0	0	0	1	2	1	1	2	1	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,15k m
Gulni	1	1	0	0	0	0	1	1	0	0	1	1	2	1	2	2	2	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,11k m
Tetarhat	1	1	1	1	0	0	1	1	0	0	1	1	2	1	2	2	1	2	1	2	1	1	2	1	1	2	2	2	Lakhisarai,8km
Nongarh	2	1	0	0	0	0	1	1	0	0	1	1	2	1	1	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,14k m
Satsanda	3	2	0	0	0	0	1	1	0	0	1	1	2	1	1	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,12k m

Ramgarh	1	1	0	0	0	0	1	1	0	0	1	1	1	2	1	2	1	2	1	2	1	1	2	1	1	2	2	2	Lakhisarai,5km
Halsi	3	2	1	1	0	1	1	1	0	0	1	1	1	1	1	2	1	2	2	2	1	1	2	1	1	1	1	1	Lakhisarai,15km
Mohiuddin Nagar	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	2	1	2	1	2	1	1	2	1	2	2	2	2	Lakhisarai,17km
Kaini	3	1	1	1	0	0	0	0	0	0	0	1	1	1	1	2	1	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,18km
Kakrauri	1	0	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Lakhisarai,17km
Mohia	1	1	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Lakhisarai,17km
Shekhpurwa	1	1	0	0	0	0	0	0	0	0	0	1	1	2	1	2	2	2	2	2	1	2	2	1	1	2	2	2	Lakhisarai,14km
Giddha	2	1	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,15km
Fatehpur	1	0	0	0	0	0	1	1	0	0	1	1	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	Lakhisarai,15k

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Manpur	1	1	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	Lakhisarai,15km
Mahsauni	1	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Lakhisarai,20km
Baghaur	1	1	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Lakhisarai,19km
Konag	2	1	0	0	0	0	1	1	0	0	1	1	1	1	2	2	1	2	2	2	2	1	2	1	2	2	2	2	Lakhisarai,18km
Rata	1	1	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,21km
Bahranwan	1	1	1	1	0	0	1	1	0	0	1	1	1	2	1	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,35km
Kharanwan	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,36km
Silwe	2	0	0	0	0	0	1	1	0	0	1	1	1	2	1	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,38km

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GeruaPursanda	1	1	0	1	0	1	1	1	0	0	1	1	1	1	2	2	2	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,34km
Bela	Uninhabited Village																												Lakhisarai
Sibsona	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	2	1	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,35km
RawanBarna	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Lakhisarai,42km
Bazidpur	1	0	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	Lakhisarai,41km
SaitnaSalaunja	3	1	0	0	0	0	1	1	0	0	1	1	1	1	1	2	1	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,30km
Harewa	1	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	2	2	2	1	2	1	1	2	2	2	Lakhisarai,27km
Dira	1	1	0	0	0	0	0	0	0	0	0	1	2	1	2	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,25km

Bardokhar	3	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	2	1	1	2	1	1	2	2	2	Lakhisarai,29km
2. District Jamui, Bihar																													
Tal Saharsa	1	1	0	0	0	0	0	0	0	0	0	1	1	2	2	2	1	2	2	2	1	2	2	1	1	1	1	1	Jamui,30km
Bakshanpur	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	2	2	1	2	2	2	2	Jamui,26km
Daulatpur	1	1	1	0	0	1	1	1	0	1	1	1	2	1	2	2	1	2	2	2	1	1	2	1	1	1	1	1	Jamui,6km
Majhwe	1	0	0	0	0	0	0	0	0	0	0	1	1	2	2	2	1	2	2	2	1	1	2	1	1	1	1	1	Jamui,13km
ChhatthuDhanawan	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,13km
Tikoi	Uninhabited Village																												Jamui
LakhanDhanawan	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,13km
Domanpura	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	1	2	2	2	1	1	2	1	1	1	1	1	Jamui,15km
Nabinagar	5	1	0	0	0	1	1	1	0	1	1	1	1	2	2	2	1	2	1	2	1	1	2	1	1	1	1	1	Jamui,15km
Lakhapur	2	0	0	0	0	1	1	1	0	1	1	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,15km
Kakan	3	1	0	0	0	1	1	1	0	1	1	1	1	2	2	2	1	2	2	2	1	1	2	1	1	1	1	1	Jamui,15km

Sonai	1	0	0	0	0	1	1	1	0	1	1	1	2	2	2	2	1	2	2	2	1	1	2	1	1	1	1	1	Jamui,12km
Dhandh	1	0	0	0	0	0	1	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,12km
Lakhanpur	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,12km
Partapur	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,11km
Rajpura	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jamui,6km
Marwa	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,9km
Dighoi	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jamui,6km
SemariaBikrampur	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,7km
AmmaSarari	1	0	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,6km
RamalBigha	Uninhabited Village																												Jamui
MisirBigha	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jamui,14km
Sangthu	1	0	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,10km
DeochandNawada	Uninhabited Village																												Jamui

Bhagwana	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,13km
Jamua	Uninhabited Village																												Jamui
Kundri Son KurhaHarla	4	0	0	0	0	1	1	1	0	1	1	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,15km
Chandwara	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	1	2	1	2	1	1	2	1	1	1	1	1	Jamui,19km
Kharsari	2	1	0	0	0	1	1	1	0	1	1	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	Jamui,14km
Ganesh Nawada	1	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jamui,15km
Mahgain	1	0	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	Jamui,15km
Harla	1	1	0	0	0	0	1	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	Jamui,15km
TOTAL (10km)	**164**	**75**	**16**	**9**	**0**	**10**	**27**	**25**	**0**	**7**	**25**	*Status for Availability and Non-Availability is shown as A (1) & NA (2) respectively*																		

Source-http://www.censusindia.gov.in/2011census/dchb/DCHB.html

Abbreviations:

Educational Facilities: P-Primary School, M-Middle School, SS-Higher Secondary Schools, SSS-Senior Secondary School

Medical Facilities: CHC-Community Health Centre, PHC-Primary Health Centre, PHSC-Primary Health Sub-Centre, MCWC-Maternity and Child Welfare Centre, H-Hospital, D-Dispensary, FWC-Family Welfare Centre

Drinking Water Facilities: T-Tap Water, W-Well Water, HP-Hand Pump, TW-Tube Well Water, R-River Water, Tk-Tank Water, O-Other Drinking Water Facility, CT-Community Toilet

Communication & Transport Facilities: PO-Post Office, SPO-Sub-Post Office, PTO-Post & Telegraph Office, Tel. -Telephone Connection, Mob. -Mobile Phone Coverage, BS-Bus Services, RS-Railways Services

Approach to Village: PR-Paved Roads, KR-Kuchha Road, FP-Foot Path

Power Supply: ED-Power Supply for Domestic use, E Ag. -Power Supply for Agricultural use, EC- Power supply for Commercial use, EA-Electricity for All Purposes

Nearest Town & Distance, km : a for < 5 Km, b for 5-10 Km and c for 10+ km of nearest place where facility is available is given.

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;

Sringirishi Ashram - The most ancient and holy place with natural scenic beauty is the place called Shringirishi Ashram. It is in the Vindhyan range and is 20 km. From district head quarters. It is said to have been the abode of the great sage Sringirishi who performed the PutrayesthiYagnya for the King Dashrath. The King gave his adopted daughter Shanta to the Rishi. There is a temple of Lord Mahadeo at this place. This place presents a picturesque natural scene. It is situated near a big reservoir and is surrounded by forests.

Ashok Dham or IndraDamaneshwarMahadeo - It has been proved from scriptures like Padma- Puran that Lord Rama crossed to the Southern side of the Ganga on his way to Shringirishi and performed Pooja of Lord Shiva named as Shri IndraDamaneshwarMahadeo at Ashok Dham. From historical records it has been established that Lord Buddha resided here for one full year for this discourses on Niravana.

JalappaAsthan - It is situated near about 4 km. from Dhanauri Station in loop line section. It is the abode of Goddess Jalappa who is known as Goddess of milchcattles.

TripurBalaSundari Maharani Asthan

It is situated in Barahiya. It is the abode of Goddess TripurSundari. The temple is made of the finest white Makrana marble. It is famous as Shakti Peeth.

JainagarPahaari - Situated on the Southern part of Lakhisarai town it contains the foundation of the fort of the Pal rulers at the top of a hillock called Jainagar. It is on the main Road of the town.

Social, Cultural Events

In the district of Lakhisarai, no major social or cultural event has taken place during the decade. However, the district has been famous for fairs and melas held at different places

throughout the year as already mentioned in the earlier chapters. Fairs and festivals are held regularly in the district. No significant activity worth mentioning had taken place in the district during the decade.

Rehabilitation & Resettlement (R & R)

Policy to be adopted (Central/State) in respect of the project affected persons including home or landoustees and landless labour.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 Kiul 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 1m 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.

Based on the above consideration that there was low emission of PM10 during transportation of ore and overburden, however during loading & unloading, transportation of ore over the haul road, emission of PM10 of the exposed area due to wind erosion and movement of light vehicles on the road were not considered and combined with mining activities. US EPA based Dispersion ISCST-3 model was used for prediction of impact with 24-h meteorological data of the study period for the assessment of GLC.

4.3.2 Meteorological Data

The meteorological data recorded at hourly interval during the month of Dec to feb 2023 on wind speed 0.92 m/s, wind direction, dry & wet bulb temperature, humidity, cloud cover and rainfall was processed to extract hourly mean meteorological data as per the guidelines of CPCB/MoEF for prediction of impacts from the area source. Stability was computed by Turner's method and mixing height was obtained from publication of IMD "Atlas of Hourly Mixing Height in India, 2008.

Data recorded from authorized source/Govt. agency were used as meteorological input for Dispersion Model which was stored in the computer for further analysis and interpretation to study the local meteorology of the study area. It was observed that westerly & north westerly was pre-dominant wind during summer as shown in wind rose (Figure 4.1) with low wind speed and 13.6 % calm condition was observed during study period at the site which was very much

close and cumbersome with long term meteorological data of IMD. Average wind speed was 0.92m/s. Impact of the pollutants was anticipated in southeast sector under influence of northeasterly & westerly winds. Ambient air quality locations were selected based on the long term wind rose pattern of the area. Air quality sampling locations were finalized to study the baseline status around the proposed site and to study impact at various locations. 24-h maximum impact of PM10 was envisaged in southeast sector at very short distance from the site due to moderate to low wind speed.

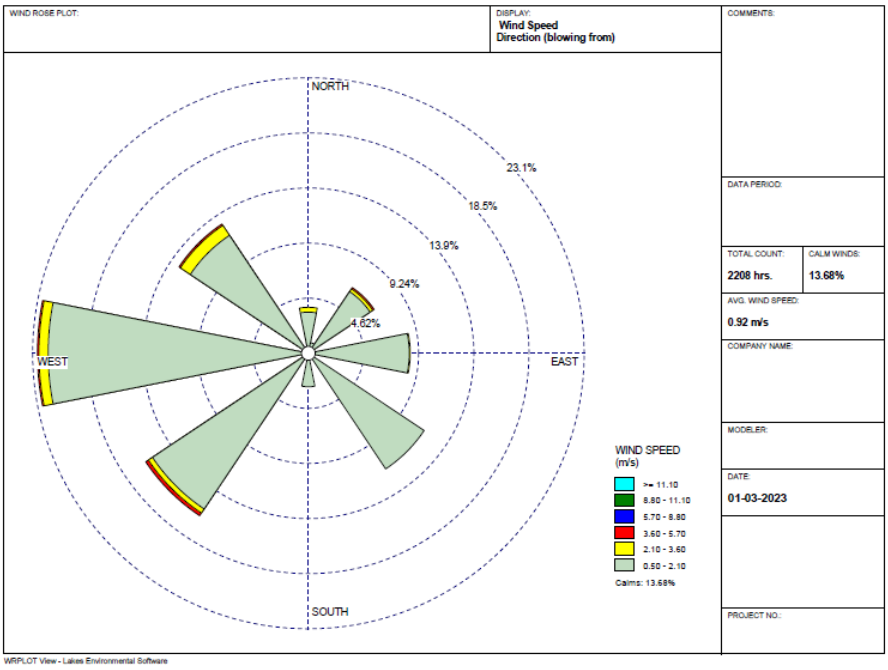

Figure 4.1: Wind Rose Diagram

Stable atmospheric condition E & F dominates in early morning and night hours and B, C & D in day hours were observed. Pollutants were dispersed from the proposed source under influence of local meteorology and dispersed on the ground in downwind direction close (~100 m) to the source under influence of moderate to low wind speed. High temperature and low humidity were observed at site with high temperature in day hours and low during night. There was no significant rain fall received and sky was clear of clouds in most of the days.

4.3.3 Frame work of Computation & Model details

By using the above-mentioned inputs, ground level concentrations due to the mining activities have been estimated to know the incremental rise in ambient air quality and impact in the study area. The effect of air pollutants upon receptors are influenced by concentration of pollutants and their dispersion in the atmosphere. Air quality modeling is an important tool for prediction, planning and evaluation of air pollution control activities besides identifying the requirements for emission control to meet the regulatory standards and to apply mitigation measures to reduce impact caused by mining activities.

PM10 was the major pollutant occurred during mining activities. Impact of area source emission was considered and prediction of impact was made on various monitoring locations in the study area due to i) loading and unloading and iii) transportation of vehicles on the haul road in the mining area. Impact was predicted in the worst case scenario due to combined impact of loading and unloading and emission due to transportation of vehicles on mine on haul road of mining area and other mining activities will occur simultaneously.

Impact was predicted over the distance of 10,000 m and 2,000 m around the source in grids of 200m & 20 m respectively in Cartesian coordinates(X,Y) to assess the impact at each receptor separately at the various locations and maximum incremental GLC value at the project site. Maximum impact of PM10 was observed close to the source due to low to moderate wind speeds. Incremental value of PM10 was superimposed on the base line data monitored at the proposed site to predict total GLC of PM10 due to combined impacts.

4.3.4 Model Results

The Air Quality Impact Prediction has been done by using "Industrial Source Complex Short Term version 3 (ISCST3), of USEPA". The main sources of air pollution with regard to the proposed project for the purpose of estimation of increase in PM10 are identified due to –

(i) Loading/unloading of ore

(ii) Transportation of ore by trucks on the Haul roads from mining benches.

Combined impact of PM10 was considered due to mining activities occurred simultaneously on various sampling locations is given in below table:

Table 4.1 Incremental Concentration of PM10 in the Study Area

SITE	Location	Distance, direction	98th percentile	Incremental Value	Total Value
AAQ 1	Mine site	--	82.9	9.5	92.4
AAQ 2	Nongarh	1.75, NW	79.7	<0.001	79.7
AAQ 3	Near Mine site	--	85.7	<0.001	85.7
AAQ 4	Bhalui village	0.24 Km, East	81.4	<0.001	81.4
AAQ 5	Mananpur	5.05 Km, East	82.3	<0.001	82.3
AAQ 6	Mahuliya	3.46 Km, East	84.1	<0.001	84.1
AAQ 7	Gopalpur	3.09km, SE	89.29	<0.001	89.29
AAQ 8	Shahnagar	7.25 Km, NW	70.50	<0.001	70.50
AAQ 9	Sadhmaf	7.00 Km, SW	84.00	<0.001	84.00
AAQ 10	Dhandh	4.11 Km, S	74.21	<0.001	74.21
AAQ 11	Ursanwan Village	0.67 Km, NW	82.08	<0.001	82.08
AAQ 12	Dhanwah Village	5.87 Km, NE	83.28	<0.001	83.28
AAQ 13	Manjhway	2.32 Km, W	81.45	<0.001	81.45
AAQ 14	Banshipur	9.56 Km, N	94.89	<0.001	94.89

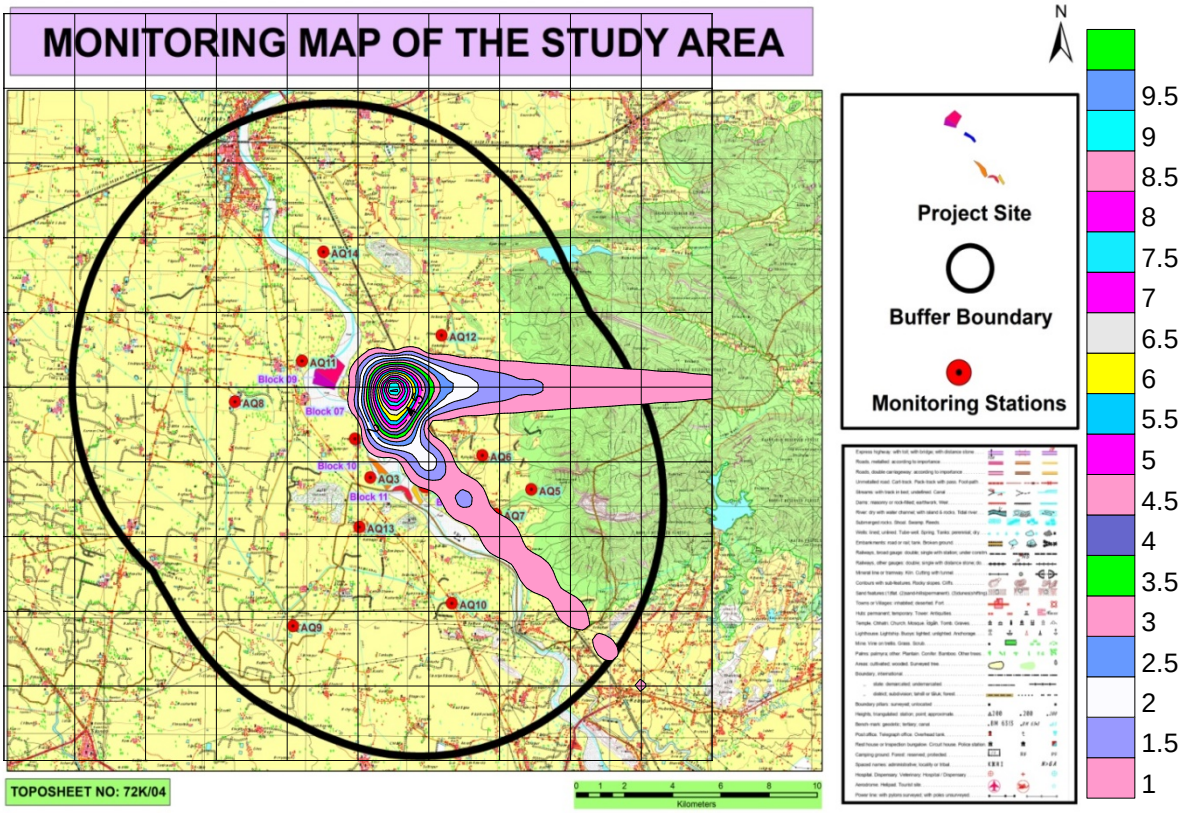

Figure 4-1, Iso-pleth of PM10

(Iso-pleth of PM10 is 9.5 µg/m^3 occurred near the project site at 2000 m x2000 m grid network during

i) ii) loading and unloading and

ii) iii) Transportation of ore over the haul road.

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 4.2, Damage risk criteria for hearing loss OSHA regulations

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

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

a. Mitigation measures

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

- 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 Kiul 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.

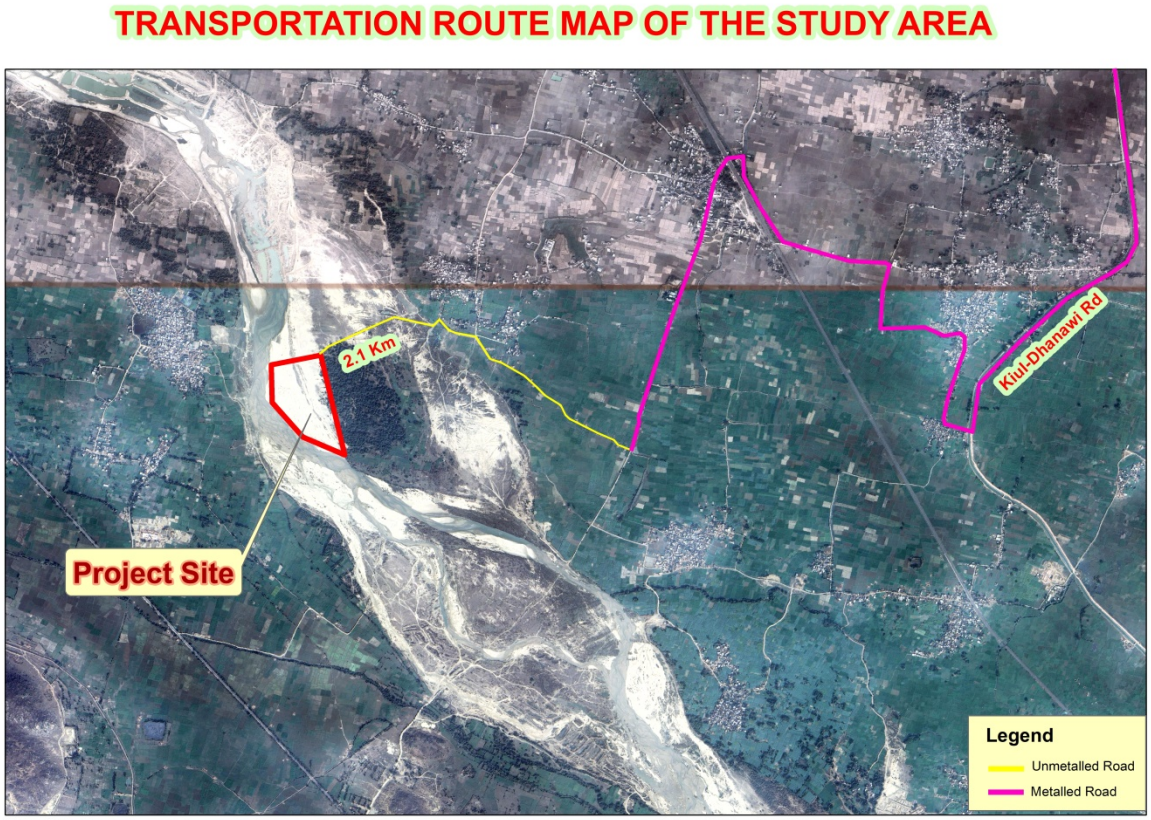

FIGURE 4.1 MAP SHOWING EVACUATION ROUTE

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 4.3 (i): Existing Traffic Scenario & LOS

Road	V	C	Existing V/C Ratio	LOS
State Highway (SH-18)	2500	15,000	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 **Cluster of Block 9**

Proposed Capacity of Mine/annum : 157734 TPA.

No. of working days : 250 days

Proposed Capacity of mine/day : 630 TPD

Truck Capacity : 16 tonnes

No. of trucks deployed/day : 52.5or say 53

Increase in PCU/day (57*3) : 159

Table 4.3 (ii): Modified Traffic Scenario & LOS

Road	V	C	Modified V/C Ratio	LOS
State Highway (SH-18)	2500+159=2659	15000	0.17	A

Results

From the above analysis it can be seen that the LOS has changed from 0.16 to 0.17 at Highway intersection that is Remain 'A' i.e Excellent', as per classification, as per classification. Hence, there will not so much adverse affect on the proposed evacuation roads due to additional traffic. Traffic management has been proposed as given 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.

TRAFFIC MANAGEMENT FOR PROJECTS IN CLUSTER

Table 4.4 Production Details of Cluster of project:

S no	Block No	Production Details
1	Block 7	305532
2	Block 8	412344
3	Block 9	157734
4	Block 10	488106
5	Block 11	228528
6	Block 12	168912
Total Production in cluster		**1761156**

Table 4.5 (i): Existing Traffic Scenario & LOS for

Cluster of Block 7, Block-8, Block-9 Block-10, Block-11-12

Road	V	C	Existing V/C Ratio	LOS
State Highway (SH-18)	2500	15,000	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 **Cluster of Block 7, 8, 9, 10, 11, & Block 12**

Proposed Capacity of Mine/annum : **1761156** TPA

No. of working days : 250 days

Proposed Capacity of mine/day : 7044.62 or say 7045 TPD

Truck Capacity : 16 tonnes

No. of trucks deployed/day : 441

Increase in PCU/day (441*3) : 1323

Table 4.5 (ii): Modified Traffic Scenario & LOS

Road	V	C	Modified V/C Ratio	LOS
State Highway (SH-18)	2500+1323=3823	15000	0.254	B

Results

From the above analysis it can be seen that the LOS has changed from 0.16 to 0.254 at Highway intersection that is from ‘A’ to 'B' i.e from Excellent’ to 'Very Good' respectively, as per classification. Hence, there will not so much adverse effect on the proposed evacuation roads due to additional traffic. Traffic management has been proposed as given below.

Traffic Management:

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

****

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

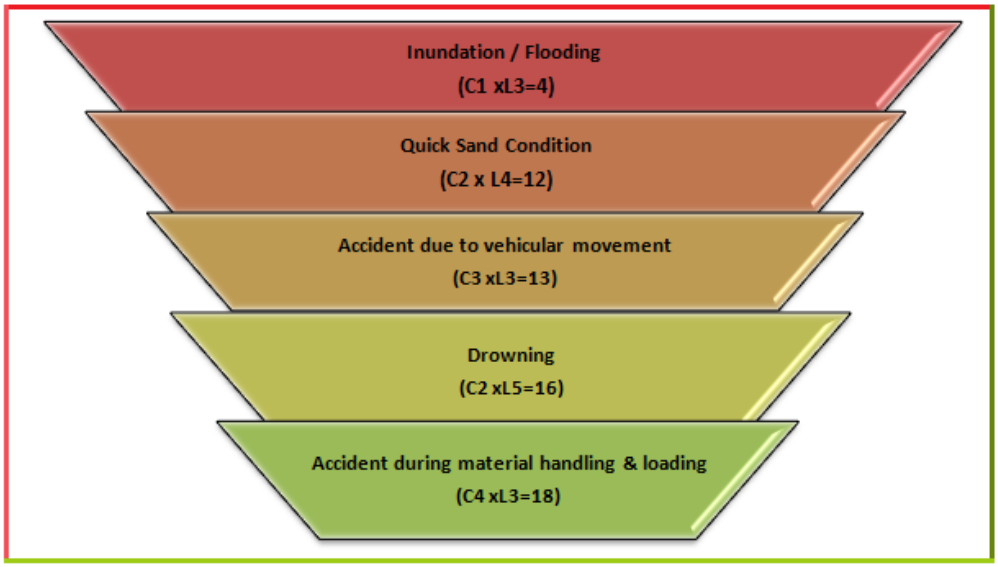
Risk Rank **Likelihood Consequence**	**L1** **Almost certain**	**L2** **Likely**	**L3** **Possible**	**L4** **Unlikely**	**L5** **Rare**
C1 **Catastrophic**	**1**	**2**	**4**	**7**	**11**
C2 **Major**	**3**	**5**	**8**	**12**	**16**
C3	**6**	**9**	**13**	**17**	**20**

Moderate					
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**: Lakhisarai District like other areas of Bihar is moderately vulnerable to earthquake as it exists in Zone III. 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 Lakhisarai 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 53 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 Kiul 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 Ghat Mining Project (Lakhisarai Block No. - 09) At Riverbed Of Kiul River at Mauza– Nongarh, Chanan Dist - Lakhisarai (Bihar) provides employment to local people who are in search of the same. The granting of environment clearance to 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 Kiul 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 Kiul 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.	**0.50**
	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.

CSR cost will be 2% of the total project cost. This amount will be used for social welfare. CSR COST is 12,31,63,000 x 2% = Rs. 24,63,260/-.

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:

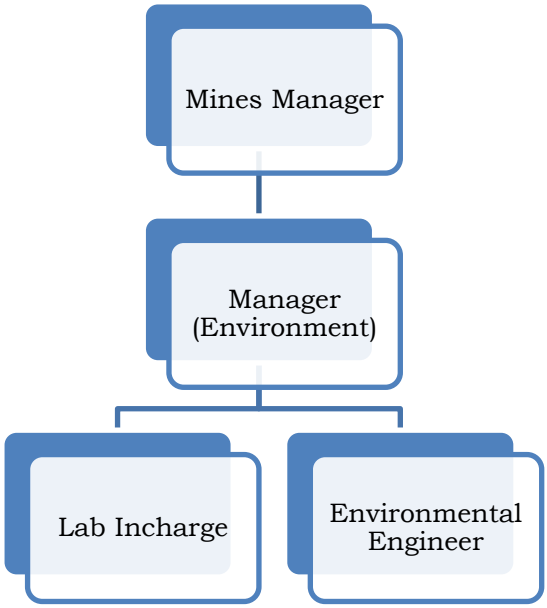

Figure 9.1 Environment Management Cell

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 1.0 m maximum 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, as 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. 127 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.
- Total Number of plants for are given below.

Sand Ghat	Area (Ha)	Plants
Block 9	12.7	12.7*10 Plants= 127 plants
Total Plants		127 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	*Azadirachtaindica*	Neem	Tolerant to SO_2
3	*Pithecolibiumducle*	Jungle jalebi	Tolerant to SO_2 and Dust control
4	*Mangiferaindica*	Aam	Tolerant to Dust control
5	*Tectonagrandis*	Sagon	Tolerant to Dust control
6	*Ficusbenghalensis*	Bargad	Tolerant to Dust control
7	*Scigiumcumuni*	Jamun	To stop river bank erosion
8	*Terminaliaarjuna*	Arjun	To stop river bank erosion
9	*Populus ciliate*	Popular	Fast growing, broad leaf
10	*Ficusreligiosa*	Peepal	Dust particles absorbance

9.6 LAND USE PLANNING

Degradation 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 Mining Project on Kiul River Block No –07 Sand Ghat at fall in Mauza– Nagardar & Chanan Dist - Lakhisarai (Bihar). 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

Sanjay Kumar For sand ghat block no 9 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 (Block-09)

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	**Nil**	**2.0**
2	Pollution Monitoring i) Air pollution ii) Water pollution iv) Noise Pollution	--	2.0
3	Plantation and salary for one gardener (part time basis).	1.27	0.5
4	Haul road Maintenance Cost	5.25	0.5
TOTAL		**6.52**	**5**

Note: *127plants * 1000 Rs (for each plants including hedges and fences) = Rs 127000/-

- 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 *2.1 km haul road) = 5,25,000/-

****

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 project is proposed by Sanjay Kumar; Mauza- Nongarh, Chanan, Dist-Lakhisarai (Bihar). Proposed Area of the Project is 12.7 ha & proposed production of Sand is 76200 cum/year or 157734 TPA.

The project is proposed is proposed for excavation of sand from the bed of river Kiul at block no-9. The proposed project is opencast semi-mechanized/OTFM mining project.

CLUSTER SITUATION As per District Survey Report Lakhisarai (Page no 53) the Proposed sand Ghats of block 7, block 8, block 9, block 10, block 11 & block 12 are comes in cluster situation whose combined cluster area is 141.8 ha. All the lease area of homogeneous minerals is coming within 500 m radius from each other confirming a cluster situation.

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 Details of Cluster is given below:

Sand Block Name	Area (Ha)	Khata	Khasra No.	Production (TPA)	Address
Block 7	24.6	89			Eklavya Stone And Mines Pvt. Ltd. Director – Nidhi

			01, 15, 366	305532	Kumari W/o – Eklavya Kumar or Kumari Priti W/o – Shree Akhilesh Kumar, Village – Pathra English, Post- Orhanpur, P.S. Muffassil, District- Nawada (Bihar).
Block 8	33.2			412344	--
Block 9	12.7	295	555	157734	Sanjay Kumar S/o Ramashray Singh Add.- New Court Area Naya Bazar, Lakhisarai.
Block 10	39.3	295, 296	555, 2316	488106	Amit Singh S/o – Late Niwas Singh Village – Paharpur, Post – Dariyapur, P.S – Barahiya, Dist – Lakhisarai (Bihar)
Block 11	18.4	65, 188	01, 555, 1226	228528	Gopal Kumar, S/o - Kedar Prasad Sharma Address : Valipur, Pipariya, Lakhisarai (Bihar).
Block 12	13.6			168912	
TOTAL	**141.8**			1761156 TPA	

10.3 BRIEF DESCRIPTION OF PROJECT

The proposed project is Open Cast Semi-Mechanized Mining of Sand with a proposed production of 157734 Tonnes per annum.

The project has been proposed by (Block 9) Sanjay Kumar S/o Ramashray Singh Add.- New Court Area Naya Bazar, Lakhisarai.

The proposed project is over an cluster area 141.8 ha on Kiul River at Tahasil - Lakhisarai Dist- Lakhisarai, 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 **Sand Block 9**- is RS-12,31,63,000 (including auction cost).

The proposed mining lease area falls in Survey of India Toposheet 72K/4.

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

Table: 10.1 Mine lease Co-ordinates (Block 9)

Pillar No	Latitude (N)	Longitude (E)
A	25° 3'48.24"N	86° 9'8.22"E
B	25° 3'30.13"N	86° 9'12.62"E
C	25° 3'33.26"N	86° 9'4.89"E
D	25° 3'39.76"N	86° 8'59.42"E
E	25° 3'46.63"N	86° 8'59.32"E

Table-10.2: Details of Environmental Setting

<table>
<tr><th>Sr. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Location</td><td></td></tr>
<tr><td>a</td><td>Village</td><td>Block No.- 9 Mauza– Nongarh, Chanan Dist - Lakhisarai (Bihar).</td></tr>
<tr><td>b</td><td>Tehsil</td><td>--</td></tr>
<tr><td>c</td><td>District</td><td>Lakhisarai</td></tr>
<tr><td>d</td><td>State</td><td>Bihar</td></tr>
<tr><td>2</td><td>Elevation above</td><td>Block No.- 09 (55 ASML to 54 ASML),</td></tr>
<tr><td>3</td><td>Nearest National Highway/State Highway</td><td>SH-18 is approx 1.40 km in SW.</td></tr>
<tr><td>4</td><td>Nearest Railway station</td><td>
<table>
<tr><th>Blocks</th><th>Railway Station</th><th>Distance (Km) Direction</th></tr>
<tr><td>Block 9</td><td>Mananpur</td><td>Mananpur Railway station at distance of approx. 2.50 Km in NE</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>5</td><td>Nearest Airport</td><td>
<table>
<tr><th>Blocks</th><th>Airport</th><th>Distance (Km) Direction</th></tr>
<tr><td>Block 9</td><td>Jayprakash Narayan Airport, Patna</td><td>Approx. 122 NW</td></tr>
</table>
</td></tr>
<tr><td>6</td><td>Ecological Sensitive Areas (Wildlife Sanctuaries)</td><td>Bhimbandh Wild life Sanctuary is in E direction from the site.</td></tr>
<tr><td>7</td><td>Seismic Zone</td><td>Zone-IV
Source BMTC 2nd edition
https://www.bmtpc.org/disaster%20resistnace%20technolgies/ZONE%20III.htm</td></tr>
</table>

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 On Kiul River at Lakhisarai Block No.- 09 Sand Ghat, Mauza– Nongarh, Chanan Dist - Lakhisarai (Bihar)
2	Mining Capacity	1761156 TPA in cluster Block 9- 157734 TPA.
3	Method of mining	Open cast semi-mechanized mining/OTFM
4	Total ML area	141.8 Ha in cluster (12.7 ha individual lease area of block 9)
5	Depth of mining	1 m depth
6	Manpower	20 persons
9	Water Requirement	BLOCK 09 – 13.50 KLD

Sr. No.	Parameter	Description
10	Source of Water	Tanker/ Nearby village.

10.4.2 Mineral Reserves and production

Slices of height 1.0m & width 6.0 m has been drawn in geological sections to calculate the mineable reserves. The area of each bench level has been calculated & multiplied by strike influence to get the volume. Volume is multiplied by bulk density (2.07 kg/m3) to get Tonnes.

Table 10.4 Classification Mineral Reserves

Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
55-54	494	235	1	116090	240307
Total				116090	240307

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 Block 09 Sand Ghat. However, as the digging depth will be restricted to 1.0 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: 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 Sand 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. 246 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

Three 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 Dec 2022 to Jan-Feb 2023 representing winter season. It was observed that the during study period, temperature ranged from 06 ^{0}C to 25.0 ^{0}C.

10.7.3 Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) has been carried out at 14 locations. The Particulate

Matter (PM_{10}) conc. ranged 51.4 µg/$m^3$to 95.9 µg/m^3. The Particulate Matter ($PM_{2.5}$) ranged from 24.5 µg/m^3 to 51.5 µg/m^3. Sulphur dioxide (SO_2) between BDL µg/m^3 to 11.3 µg/m^3.Oxides of Nitrogen (NO_2) between 5.7 µg/$m^3$to 21.4 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

To assess the physical and chemical properties of water in the region, water samples from 06 locations were collected from various water sources around the mine lease area. The pH was varying for ground waters from 7.31 to 7.64.The total dissolved solids are varying from 382 mg/l to 340 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 38.67 dB(A) , 55.45 dB(A). The minimum & maximum noise levels at night time were found to be 32.54 dB (A) & 43.54 dB(A) at NQ11respectively.

10.7.6 Ecological Environment

Based on the field studies and review of published literature, it is observed that there are. Bhimbandh Wild life Sanctuary is about 2 Km away in NE direction from the site and there are no National Parks within the study area of 10-km radius.

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 Kiul 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

Table 10.6 (a), Budget of EMP (Block-09)

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	**Nil**	**2.0**

2	Pollution Monitoring i) Air pollution ii) Water pollution iv) Noise Pollution	--	2.0
3	Plantation and salary for one gardener (part time basis).	1.27	0.5
4	Haul road Maintenance Cost	5.25	0.5
TOTAL		**6.52**	**5**

Note: *127plants * 1000 Rs (for each plants including hedges and fences) = Rs 127000/-

- 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 *2.1 km haul road) = 5,25,000/-

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.

CSR cost will be 2% of the total project cost. This amount will be used for social welfare. CSR COST is 3,03,58,000 x 2% = Rs. 6,07,160/-.

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.

****

Project: Sand Ghat Mining Project (Lakhisarai Block No.- 09) At Riverbed Of Kiul River at Mauza– Nongarh, Chanan Dist - Lakhisarai (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)		Cat.
		NABET	MoEFCC	
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
Dated: February 3, 2020

Certificate No.
NABET/EIA/1922/IA0053

Valid till
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/23/2698 March 07, 2023

To

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

Sub.: Extension of Validity of Accreditation till June 06, 2023 – regarding
Ref.. Certificate no. NABET/EIA/1922/IA0053

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 June 06, 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

CHAPTER-11 DISCLOSURE OF CONSULTANT

Project: Sand Ghat Mining Project (Lakhisarai Block No.- 09) At Riverbed Of Kiul River at Mauza– Nongarh, Chanan Dist - Lakhisarai (Bihar).

Consultant Contact Details:

P and M Solution

Address –C-88, Sector 65 Noida

Mobile no. - +8377871554, 8826287364

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

****

ANNEXURE - I

TOR

File No.SIA/1(a)/2290/2023

Goverment of India

State Level Environment Impact Assessment Authority

Bihar

***

To,

M/s SANJAY KUMAR
S/o - Ramashray Singh, New Court Area, Naya Bajar, Lakhisarai,
Lakhisarai-811105
Bihar

Tel.No.-; Email:sanjay15286lkr@gmail.com

Sub. Terms of Reference to the Sand Ghat Mining Project (Lakhisarai Block No.- 09) at Riverbed of Kiul River, S/o - Ramashray Singh, New Court Area, Naya Bajar, Lakhisarai

Dear Sir/Madam,

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

1. Proposal No.:	SIA/BR/MIN/415660/2023
2. Name of the Proposal:	Sand Ghat Mining Project (Lakhisarai Block No. - 09) at Riverbed of Kiul River
3. Category of the Proposal:	Non-Coal Mining
4. Project/Activity applied for:	1(a) Mining of minerals
5. Date of submission for TOR:	24 Jan 2023

Date : 14-02-2023

Mr. Sudhir Kumar
(Member Secretary)

Office : **2nd Floor, Beltron B**
Phone No : Mobile : **9661208124**
Email id : **seiaa.ms.br@gmail.com**

Note : This is auto tor granted letter.

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

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

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

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

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

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

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

2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.

3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.

4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the areashould be provided. Such an Imagery of

the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

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

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

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

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

9) The study rea will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

10) Land use of the study rea delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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ANNEXURE - II

LOI

जिला खनन कार्यालय, लखीसराय।

पत्रांक– 1557 /एम0, दिनांक 08/12/2022 /

प्रेषित,

संजय कुमार,
पिता– रामाश्रय सिंह,
पता– न्यू कोर्ट एरिया नया बाजार, लखीसराय।
मो0 नं0– 9110965575

विषय :– लखीसराय जिलान्तर्गत किउल नदी ब्लॉक नं0– 09 की बन्दोबस्ती हेतु सैद्धान्तिक स्वीकृत्यादेश निर्गत करने के संबंध में।

महाशय,

उपर्युक्त विषय के संबंध में सूचित करना है कि लखीसराय जिलान्तर्गत किउल नदी ब्लॉक नं0–09, मौजा–नोनगढ़, चानन की ई निलामी द्वारा बन्दोबस्ती में संजय कुमार, पिता– रामाश्रय सिंह, पता– न्यू कोर्ट एरिया नया बाजार, लखीसराय द्वारा उच्चतम बोली की राशि–12,11,58,000/– (बारह करोड़ ग्यारह लाख अंठावन हजार) रूपये मात्र की बोली लगाकर नीलामी ली गई है। नीलामी की राशि का 25% प्रतिभूति राशि (अग्रधन की राशि को समायोजित करते हुए) कुल– 2,74,32,000/–(दो करोड़ चौहत्तर लाख बत्तीस हजार) रू0 मात्र जमा करने के उपरांत सैद्धान्तिक स्वीकृत्यादेश निर्गत किया गया है।

1. बालू खनन क्षेत्रों का विवरण निम्न प्रकार है :–

क्रं0 सं0	नदी, घाट का नाम एवं पता	Area (Hectare)	GPS CO- ORDINATES LATITUDE & LONGITUDE		
1	किउल नदी, ब्लॉक नं0–09, मौजा– नोनगढ़, चानन, लखीसराय।	12.7	A	25° 3'48.24"N	86° 9' 8.22"E
			B	25° 3'30.13"N	86° 9' 12.62"E
			C	25° 3'33.26"N	86° 9' 4.89"E
			D	25° 3'39.76"N	86° 8' 59.42"E
			E	25° 3'46.63"N	86° 8' 59.32"E
2	भीमबांध वन्य प्राणी आश्रयणी के ESZ से दूरी	3.6km			
3	सुरक्षित क्षेत्र/वन अभ्यारण्य क्षेत्र/पक्षी अभ्यारण्य/वन्य जीव आश्रयण क्षेत्र से दूरी	5.8 km			
4	बालूघाट/बालूखण्ड से 500 मीटर के अन्दर खनन पट्टा क्षेत्र की स्थिति	हाँ { ब्लॉक –08 , रकवा–33.2 हेक्टेयर ब्लॉक– 10, रकवा–39.3 हेक्टेयर }			
5	पुरातात्विक स्थल से दूरी	लागू नहीं			
6	खनन योग्य मात्रा	76200M^3			
7	मौजा	नोनगढ़ / 186			
8	खाता	295			
9	खसरा	555			

2. भुगतान की शर्तें:–

(i) नीलामी– राशि केवल प्रथम वर्ष के लिए बंदोबस्ती की राशि मानी जाएगी। दूसरे वर्ष और उसके अनुक्रमी वर्षो में बंदोबस्ती की राशि गत् वर्ष की बंदोबस्ती राशि के 120 प्रतिशत् अथवा समय–समय पर सरकार द्वारा निर्धारित निदेशो के अनुरूप होगा।

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

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

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

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

5. जिला खनिज फाउन्डेशनः–सफल डाकवक्ता को बंदोबस्ती राशि की 2 प्रतिशत राशि जिला खनिज फाउण्डेशन को जिला पदाधिकारी के पदनाम से भुगतेय बैंक ड्राफ्ट के माध्यम से जिला खनिज फाउण्डेशन नियमावली, 2018 के अनुसार करना होगा।

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

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

ii. पर्यावरणीय स्वीकृतिः–सफल डाकवक्ता/बंदोबस्तधारी खनन योजना अनुमोदन के 15 दिनों के अन्दर पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार के सक्षम प्राधिकार के समक्ष पर्यावरणीय स्वीकृति (EC)के लिए प्रस्ताव समर्पित करेगा। समयबद्ध रीति से पर्यावरणीय एवं अन्य वैधानिक स्वीकृति प्राप्त करना सफल डाकवक्ता की जिम्मेवारी होगी। अपेक्षित

पर्यावरणीय स्वीकृति एवं अन्य आवश्यक स्वीकृति प्राप्त करने में किसी भी प्रकार की देरी के लिए सफल डाकवक्ता स्वंय जिम्मेवार होंगे एवं इस संबंध में किसी भी प्रकार की क्षतिपूर्ति के लिए कोई भी दावा मान्य नहीं होगा।

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

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

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

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

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

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

8. निविदा के निम्नलिखित शर्तों एवं बन्धेजों का अनुपालन सुनिश्चित करना होगा।

(i) निविदादाता/सफल डाकवक्ता/बंदोबस्तधारी द्वारा ई—मेल के माध्यम से किया गया पत्राचार ही मान्य होगा।

(ii) बन्दोबस्ती लेने के बाद सभी बालूघाटों के लिये बालू के उत्तोलन कार्य में संलग्न सभी सहयोगी व्यक्तियों/प्रबंधकों की सूची, पूर्ण पता एवं फोटो के साथ एक माह के अन्दर समाहर्त्ता को उपलब्ध कराना एवं पोर्टल पर अपलोड करना होगा। यदिइसमें कोई बदलाव होता है तो उसकी भी सूची अविलम्ब पोर्टल पर अपलोड/उपलब्ध करायेंगे।

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

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

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

(vi) बालूघाट की सुरक्षा की जिम्मेदारी बंदोस्तधारी की होगी।

(vii) बन्दोबस्तधारी बंदोबस्त क्षेत्र के भीतर किसी अवैध खनन के लिए जिम्मेवार होंगे और पाई गई किसी शिकायत पर गंभीरता से विचार किया जाएगा तथा बंदोबस्तधारी के विरूद्ध अपराधिक मामला दायर किया जाएगा।

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

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

(ix) बालू बंदोबस्तधारी को बालू लदे भारी वाहनों का परिवहन जल संसाधन विभाग द्वारा नहरों एवं बांधो पर निर्मित प्रतिबंधित सड़क या परिवहन विभाग द्वारा प्रतिबंधित सड़क/पुल–पुलिया से नहीं करना है।

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

(xi) बंदोबस्तधारी द्वारा बालूघाटों से बालू का परिवहन बिहार खनिज (समानुदान, अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली 2019, (यथा संशोधित) के प्रावधानों एवं इस संबंध में अन्य अधिसूचित नियम के तहत किया जाएगा। अनियमितता की स्थिति में उपरोक्त नियमावली के तहत जुर्माना लगाया जाएगा।

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

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

Sandheer
08/12/2022

खनिज विकास पदाधिकारी,
लखीसराय।

खनिज विकास पदाधिकारी का कार्यालय
सत्यमेव जयते
लखीसराय

ANNEXURE - III

MINE PLAN

बिहार सरकार,
खान एवं भूतत्व विभाग।

पत्रांक– 189 /एम0, पटना, दिनांक– 12/1/2023

प्रेषक,

मो0 मोईज उद्दीन,
संयुक्त सचिव।

सेवा में,

Email

संजय कुमार,
पिता– रामाश्रय सिंह,
पता-- न्यू कोर्ट एरिया नया बाजार, लखीसराय।
Email- sanjay15286lkr@gmail.com

विषयः– **लखीसराय जिला के किउल नदी ब्लॉक नं0– 09 के खनन योजना के अनुमोदन के संबंध में।**

महाशय,

उपर्युक्त विषय के संबंध में कहना है कि बिहार बालू खनन नीति–2019 यथा संशोधित एवं बिहार खनिज (समानुदान अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली, 2019 (यथा संशांधित 2021) के नियम–17 में वर्णित प्रावधानों के तहत् **लखीसराय जिला के किउल नदी ब्लॉक नं0– 09** से संबंधित समर्पित खनन योजना के अनुमोदन पर प्राधिकृत समिति द्वारा समीक्षा की गई। समीक्षोपरांत निम्न शर्त्तों एवं बंधेजों के तहत् खनन योजना अनुमोदित की जाती है –

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

P.T.O.

MINING PLAN

WITH

PROGRESSIVE MINE CLOSURE PLAN

Submitted under Rule (17) of Bihar Minerals (concession, prevention of illegal transportation & storage) Rules 2019

OF

BLOCK NO.- 09 SAND GHAT
RIVER - KIUL

in Mauza– Nongarh, Chanan,

District- Lakhisarai (Bihar).

APPLIED AREA- 51.3 HECTARES

PLAN PERIOD: FOR FIVE YEARS

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

SETTLEE
Sanjay Kumar
S/o Ramashray Singh
Add.- New Court Area Naya Bazar, Lakhisarai.
Mob.- 9110965575.

Prepared By:
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CONTENT

LIST OF ANNEXURES

ANNEXURE NO.	NAME OF ANNEXURE
1	COPY OF LETTER OF INTENT
2	COPY OF RQP CERTIFICATE

LIST OF PLATES

PLATE NO.	LIST OF PLATES
1	LOCATION MAP
2	GOOGLE & ROUTE MAP
3	KEY PLAN
4	LEASE MAP
5	SURFACE GEOLOGICAL PLAN
6	GEOLOGICAL SECTION
7A	DEVELOPMENT PLAN (PRE MONSOON)
7B	DEVELOPMENT PLAN (MONSOON)
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8	CONCEPTUAL PLAN
9	PROGRESSIVE MINE CLOSURE PLAN

MINING PLAN

PART A

CHAPTER–1

1. INTRODUCTION

1.1	Settlee Name & Full address Phone. No. E-Mail ID	Sanjay Kumar S/o Ramashray Singh Add.- New Court Area Naya Bazar, Lakhisarai. 9110965575. -
1.2	Letter no. / date of lease execution & lease period	District Magistrate issue LOI on letter no. 1557/M Dated. 08.12.2022 for a period of 05 years (Annexure No. -1)
1.3	Settlee post/social status	Private
1.4	Mineral or Minerals which the Settlee intends to mine	Sand
1.5	Applied area for mining lease	Block No.- 09 Sand Ghat Lease has an applied area of 12.7 Hectare.
1.6	Name & address of RQP & Regd. No. Mobile No. E-mail ID	Er. Pravin Kr Sinha Reg. No. - RQP/BIH/SR.NO.20 LETTER NO.3825 DATED 07/11/2019 **Consultant** P & M Solution 201,Mangal Market Raja Bazar, Pastna 9889024004 & 7542949027 indusminingbihar@gmail.com
1.7	RQP Certificate	RQP certificate copy attached as **Annexure 2**
1.8	Name of the Prospecting agency	The base data is collected from various geological reports of the Department of Mines & Geology and local authorities as well as detailed prospecting of the area is carried out by the RQP.
1.9	Status of Environmental clearance	After Mining Plan approval then Settlee shall submit application to state Environment Impact Assessment Authority (SEIAA) of Bihar for environment clearance.
2.0	Date of Survey	10.12.2022

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CHAPTER–2

2. PROJECT DESCRIPTION

2.1 JUSTIFICATION OF PROJECT

Sand is a 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. 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 sand, etc. which travelled as sediments with the flow. Huge amount of sand get deposited along the river course wherever conditions were favorable. As a result of continuous deposit of sand, the rivers may change their course, by widening itself and expanding, can result in flooding, inundation and breaking their banks, may cause devastation of property and loss of life. The rivers thus, needed channelization and therefore, extraction of sand through mining was expedient. The haphazard mining of sand 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 sand is a 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.

2.2 BACKGROUND OF THE PROJECT

The Department of Mines & Geology, Bihar required under Bihar Minerals (Concession, Prevention of Illegal Mining, Transportation & Storage) Rules, 2019 & Bihar Sand Mining Policy, 2019. The general conditions of mining lease for minor minerals are mentioned here below:

- First the State Government shall identify the areas which are suitable for river bed mining based on quantity of the minor minerals available and suitable from ecological and environmental aspects as well.
- Under rule 17 (4) Approval and submission of Mining Plan - All Mineral Concession Holders or the Government/Corporation as the case may be shall submit a mining Plan duly prepared by an RQP and approved by the Director or any officer / person/academic institution/Govt. agency authorized by the Department in this regard within a period of three months from the date on which communication regarding grant of mineral concession is received or such other period as may be decided/ allowed by the department for the submission of the approved Mining Plan.
- While preparing the mining plan, proper attention has been paid to ensure that the relevant provisions under MMDR Act-1957, MMR- 2019, Mines Act-1952, Mines Rules-1955, Sustainable Sand Mining Guidelines – 2016 and Enforcement & Monitoring Guidelines for sand Mining - 2020 have been followed. All safety measures, provided in the statue, will be taken into consideration. On 17.09.2019 Bihar Government took its policy decision vides notification no. – 4/V.Mu-20-93 / 18-3174 /M . That all Mining Lessee / Settlee under rule 17 of the said Rules, the lessee shall submit the mining plan with Progressive Mine closure plan for approval to the competent officer , Department of Mines & Geology, Bihar
- Mining operation to be in accordance with Environmental clearance.
- For baseline, data assistance has been taken from the data, available from local authorities.

2.3 Restricted areas for sand quarrying

i. The quarrying of sand shall be prohibited within up to a distance of 1 kilometre (1 km) from major bridges and highways on both sides, or five times (5x) of the span (x) of bridge/public civil structure (including water intake points) on up-stream side and ten times (10x) the span of such bridge on down-stream side, subjected to a minimum of 250 meters on the upstream side and 500 meters on the downstream side.

ii. No quarrying shall be permitted within 50 (fifty) meters of any public place i.e. cremation Ghat or any religious place etc.

iii. No quarrying shall be allowed to be extracted where erosion may occur, such as at the concave bank.

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iv. The quarrying of sand shall be prohibited within 100 (one hundred) meters upstream and downstream from any dam/weir or any other structure erected for irrigation purpose.

v. Sand Ghats should preferably be located on the river side embankment. For low embankment less than 6 meters height, quarrying should not be done within 25 meter from toe/heel of the embankment and depth of mining should not be more than 1.0 meter. In case of higher embankments, the distance should not be less than 50 meter and depth of mining should be maximum 1.50 meter and at a distance of 75 meter of more mining depth should be maximum 2.0 meter. In order to obviate the development of flow parallel to embankment, crossbars of width eight times the depth of mining pits spaced at 50 to 60 meters center to center should be left in the mining pits.

vi. The irrigation outlet shall be maintained at the same level as that of the river bed and in no case, the river bed level shall be permitted to be below the irrigation outlet level. No quarrying shall be permitted around the infiltration well/intake well up to a distance of 5 meters.

vii. No quarrying of sand shall be permitted in any private land owned by a person other than a settlee unless the settlee obtains the consent of the concerned land owner/raiyat.

viii. No quarrying of sand shall be permitted in any area which the State Government notifies as restricted area.

ix. Mining depth should be restricted to 3 meters and distance from the bank should be ¼th or river width and should not be less than 7.5 meters.

x. Demarcation of mining area with pillars and geo-referencing should be done prior to the start of mining.

xi. A buffer distance /un-mined block of 50 meters after every block of 1000 meters over which mining is undertaken or at such distance as may be the directed/prescribed by the regulatory authority shall be maintained.

xii. River bed sand mining shall be restricted within the central 3/4th width of the river/rivulet or 7.5 meters (inward) from river banks but up to 10% of the width of the river, as the case may be and decided by regulatory authority while granting environmental clearance in consultation with irrigation department. Regulating authority while regulating the zone of river bed mining shall ensure that the objective to minimize the effects of riverbank erosion and consequential channel migration are achieved to the extent possible. In general, the area for removal of minerals shall not exceed 60% of the mine lease area, and any deviation or relaxation in this regard shall be adequately supported by the scientific report.

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CHAPTER–3

3. LOCATION, GENERAL AND ACCESSIBILITY

3.1 LOCATION

(a) Details of the area

(i)	**Lease-hold area**	12.7 Hect.		
	Location	Block No.- 09 Sand Ghat fall in Mauza– Nongarh, Chanan, District- Lakhisarai (Bihar). The location map is enclosed **(Plate No. 1)**		
(ii)	**Mining Lease Map**	Khata no.- 295. Khesra No.- 555. Google Map of Block No.- 09 Sand Ghat is attached as **Annexure no. 3.**		
(iii)	**District & State**	Lakhisarai , Bihar		
(iv)	**Mining Plot**	**Sand Ghat**	**River**	**Area (ha)**
		Block No.- 09	Kiul	12.7
(v)	**Name of Ghat**	Block No.- 09 Sand Ghat of 12.7 hectares.		
(vi)	**Ghat details**	12.7 ha (Kiul River bed)		
(vii)	**Coordinates**	The area & geographical coordinates of Block No.- 09 Sand Ghat is given in **Table No.1**		
(viii)	**Topo sheet No.**	**72 K/4 & 72L/1.**		

BLOCK NO.- 09 SAND GHAT CO-ORDINATES

S. No	Sand Ghat	Area (in Ha)	Co-ordinates		Ghat/Village	River
1	BLOCK NO.- 09	12.7	A	25° 3'48.24"N 86° 9'8.22"E	Mauza– Nongarh, Chanan, District- Lakhisarai (Bihar).	Kiul
			B	25° 3'30.13"N 86° 9'12.62"E		
			C	25° 3'33.26"N 86° 9'4.89"E		
			D	25° 3'39.76"N 86° 8'59.42"E		
			E	25° 3'46.63"N 86° 8'59.32"E		

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(b) Key plan of area:-

Key plan of Sand Ghat (Kiul River) is attached as **Plate-2.**

Total mining area is completely outside of any restricted or protected area by any state or central government.

3.2 GENERAL

(a) Mineral being worked	Sand
(b) Period of Mining Lease	The lease period has been granted for Five years.
(c) Category of Land used	The mining area is inactive channel of riverbed
(d) Relief of Plot	Block No.- 09 Sand Ghat (53.7 ASML to 55.5 ASML)
(e) Existing pits	As the mining area is of river bed and it will be replenished every year no pits will be formed.
(f) Type of lease area:	Total area is almost hundred percent river bed flood plain land & it is free from forest land.
(g) Present land use pattern:	The existing land use is given below:

Sr. No.	Land use	River bed (Ha)	Forest Land (Ha)	Barren land (Ha)	Grazing Land (Ha)
1	Mining pits Quarry	-	-	-	-
2	Approach Road	-	-		-
3	Dumps	-	-	-	-
4	Office, Resht Shelter etc.	-	-	-	-
5	Balance undisturbed land	12.7	-	-	-
	Total	12.7	-	-	

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3.2 ACCESSIBILITY

Lakhisarai is a beautiful and important place in the state of Bihar. This district was established on the 3rd of July 1994. Before coming into existence as a new district, Lakhisarai was a sub-division within Munger District. Historians established on the basis of analysis of evidences, that this place was a reputed religious center for the Hindus in the period of Pal. The ruler of that time was fond of making Temples and other religious spots. It is one of the reasons that there are so many temples and other religious places within this region. Some significant temples and religious spots within the district are Ashokdham, Bhagwati Mandir of Barahiya, Sringi Rishi, Jalappa Asthan, Abhainath Asthan on Abhaipur Mountains, Maharani Asthan of Abhaipur, Govindbaba Asthan (Mandap) Rampur and Durga Asthan Lakhisarai etc.

Project site is falls in Mauza- Nongarh, Chanan. Site is well connected by SH-18 Rd which is at distance of approx. 1.50 Km in West direction. Nearest NH/SH is SH-18 at distance of 1.50 Km in West direction. Nearest railway station is Mananpur Railway Station at distance of approx. 4.50 km in NE. Nearest airport is JPN International Airport Patna at distance of approx. 121 km in NW.

CHAPTER-4

4.1 GEOLOGY & EXPLORATION

4.1.1 TOPOGRAPHY

The area represents a rough and rugged topography. A detailed geological map on 1:1000 scales with contour interval. The area shows a general slope toward N-E while the highest RL of 47.2 m occurring on the South –East side of the area along boundary pillar, whereas the lowest RL of 40.7 m within the lease area is found along N-E slope near boundary line. The surface plan of the area is shown in Plate No-05.

Geomorphology

The district has a diverse landscape ranging from hills to flood plains. The major geomorphic units are rocky upland, pedi-plain, alluvial plain and flood plains.

The Rocky Upland area comprises series of Kachhua and Kajra hills. These hill tracts constitute elevated and rugged landmasses surrounded by alluvial plains. The altitude of hills varies from 250 to 50 0m amsl. It comprises mainly quartzite, phyllite and schist of Kharagpur formation. The rocks of Kharagpur formation have undergone tectonic deformation giving rise to variety of deformational structures. The rocky uplands are limited mainly in Suraj garha block.

Pedi plain is represented by an area formed through coalescence of pediments and thus forms rolling topography and comprises residual soil overlain by mixture of sheet wash deposits. It extends all along the Kharagpur hills.

Older Alluvial Plain forms a major part of the district. It comprises sediments deposited by Ganga river and also the sediments derived from the denudation of Chota Nagpur plateau and Kharagpur hills. This is also known as marginal alluvial plain due to its limited thickness. Although the thickness of this alluvium at Ashok dham village is about 123m but reduces considerably in the southeastern parts ranging from 15 to 20m.

Younger Alluvial Plain forms the northern parts of the district and stretches few km to the south of Ganga rive. Almost all of Pipariya and some part of Barahiya blocks are considered as flood prone area. These areas remain inundated in rainy season. Locally, this is called "Tal" area. Diara area is level to gently undulating ground. The mighty Ganga meanders in this parts and usually remains flooded from middle of July to the end of September. The relief of this plain varies on an average from 25 to 65m above mean sea level.

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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-4.1:- Geological Succession and their Occurrences 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

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4.1.2 GEOLOGY OF THE AREA

The Archaeans are the oldest rock formation in the state. The most predominant rocktype is mainly of gneisses and granitic rocks with lesser amount of schists, quartzites, basicintrusives and pegmatoides. They are exposed in Aurangabad, Gaya, Nawada, Jamui, Bhagalpur and Banka districts.

Based on broad geomorphic parameters such as relief, drainage pattern and geology, Bihar may be divided into three geomorphic domains.

(i) Uplifted block of hilly southern highlands comprising the northern part of the Kodarma- Santhal Pargana planation surface, falling in parts of Bihar, northern fringe or escarpment of Chotanagpur plateau and Rohtas plateau

(ii) The transition zone between the southern highlands and the Great Ganga Plains, constituting the central Bihar Plains, and

(iii) The Ganga foredeep of the North Bihar Plains bounded by the rising Himalaya in the north and the Ganga R. in the South

4.1.3 Local Geology

Kiul River is a tributary of Ganges. It originates in Giridih of Jharkhand and flows through Lakhisarai, Sheikhpura and Jamui districts of the Indian state of Bihar and joins Harohar river in the Diara region. Kiul originates from the Tisri Hill Range in Kharagdiha police station area of Giridih district. After forming the boundary of the district for a short distance it enters Jamui district through a narrow gorge near the Satpahari hill. It first flows in an easterly direction close to the southern base of the Girdheswari Hills. It turns northward at their eastern extremity and passes near the town of Jamui. Two miles south of Jamui it is joined by Barnar, below this point it receives the Alai, a mountain stream and near Jamui railway station it is joined by the Anjan. It then flows north-east up to Lakhisarai, It passes below the railway bridge between Kiul junction and Lakhisari station and is joined a few miles north of that place, near RahuaGhat, by the Harohar (Halahar or Harhobar), a continuation of the Sakri River. After this it turns due east and falls into the Ganges near Surajgarha. Until it meets the Harohar the Kiul has broad sandy bed and in some places is as much as half a mile wide, though it contains very little water in summer.

The litho units encountered in the riverbed and surrounding areas belongs to the Shivalik super groups. The size of the sediments towards the source i.e. host rock is course and at the tale end of the river the grain size is reduced to smaller sizes resulted in the formation of clay beds. The following sequences have been observed in the area, i.e. Top soil/ Alluvium followed by sand deposition (as shown in the figure below).

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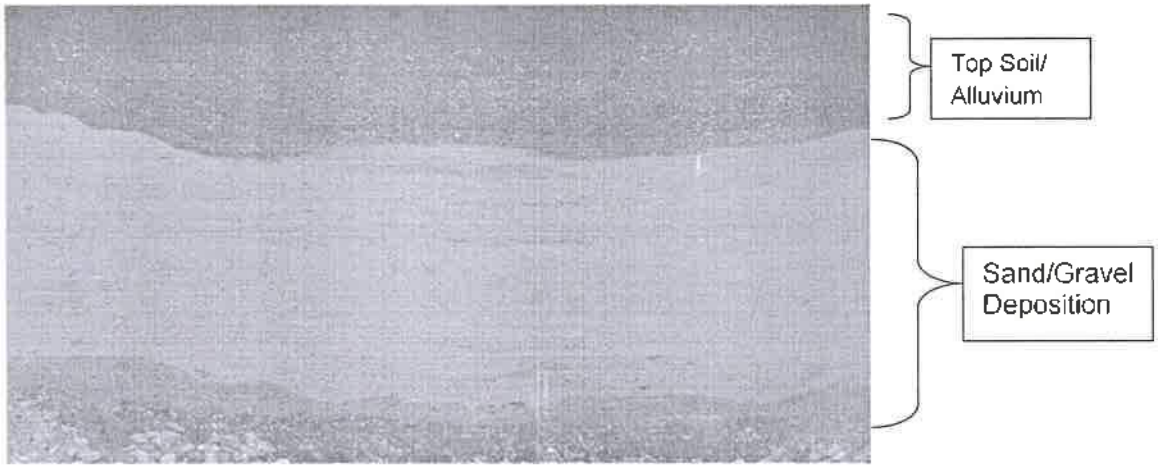

Sand and silt are deposited in the middle of the river whereas fine sand and soil are deposited at the fringe of the riverbanks.

Soil/ alluvium varying in thickness from 0.20m to 0.60m m constitute the top horizons in the area suitable for agriculture. River Ganga meanders through the area exposing the alluvium and soil at the banks. Sand is found in the river bed upto a depth of more than 1.0 m. The major part of bed remains dry as water flows in a single stream during the non-monsoon seasons. Only during rainy seasons the entire flood plain has water, when there will be no mining done.

4.2 ORIGIN & CONTROL OF MINERALIZATION (ANNUAL REPLENISHMENT OF MINERAL IN RIVER BED AREA/SEDIMENTATION)

Sedimentation, in the geological sciences, is a process of deposition of a solid material from a state of suspension or solution in a fluid (usually air or water). Broadly defined river sand is a product of natural weathering of rocks over a period of millions of years and these materials get collected under the impetus of gravity alone, as in talus deposits, or accumulations of rock debris at the base of cliffs. The term is commonly used as a synonym for sedimentary petrology and sedimentology.

Sedimentation is generally considered by geologists in terms of the textures, structures, and fossil content of the deposits lay down in different geographic and geomorphic environments.

The factors which affects the "Computation of Sediment":

Geomorphology & Drainage Pattern: The following geomorphic units plays important role:

- Structural Plain
- Structural Hill
- Structural Ridge
- Denudation Ridge & Valley
- Plain & Plateau of Gangetic plain

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- Highly Dissected pediment
- Un-dissected pediment
- Distribution of Basin Area River wise
- Drainage System/Pattern of the area, Rainfall & Climate: Year wise Rainfall data for previous 5 years .
- As per Dandy & Bolton study "Sediment Yield" can be related to
- Catchment Area and
- Mean Annual Run-off

Sand is an essential minor mineral used extensively across the country as a useful construction constituent and variety of other uses in sports, agriculture, glass making (a form of sand with high silica content) etc. It is common knowledge that minerals are non-renewable but this form of mineral naturally gets replenished from time to time in a given river system and is very much interrelated to the hydrological cycle in a river basin.

Sand mining has become a widely spread activity and does not require a huge set up or technology, the number of ventures has increased extensively and it has become a footloose industry in itself but the backward-forward linkages are becoming stronger as many are getting employed as well as the construction activity / industry requires this mineral at consistent rates. Riverine environmental systems are unique in themselves and provide environmental services, natural resources to meet variety of needs of urban and rural communities.

4.2.1 REPLENISHMENT STUDY OF MINED AREA OF KIUL RIVER:-

Replenishment Rate is the rate at which sand is transported into the river channel, which is under examination or subjected to sand extraction. This volume is often considered as sustainable yield of that river. Estimation of sand discharge through stream bed and its residence period (temporary deposition) is one of the most difficult task in sediment budgeting.

The rate of gross or absolute silt production (erosion) in the watershed and the ability of the stream system to transport the eroded material in a river and then to a reservoir has the direct relation with the quantity of sediment delivered into a reservoir. It has been observed that the average rate of sediment production decreases as the size of drainage area increase and the larger watershed the lesser is the variation between the rates. The larger watershed presents more opportunity for deposition of silt during its traverse from the point of production.. The total amount of eroded material, which reaches a particular hydraulic control point, is termed as sediment yield. The sediment control of inflow is governed by Character of run-off; Susceptibility of soils; the extent and density of vegetative cover in the area; and the hydraulic efficiency of the drainage system.

M/S SANJAY KUMAR
Proprietor

This report quantifies the annual replenishment of bed material in the Kiul River during periods of sediment transport at high flows within the mined area. It provides estimates of the amounts of sand & bajri which will be used in construction and for other uses.

4.2.2. METHODOLOGY FOR REPLENISHMENT STUDY:-

The methodology used for Replenishment study is based on the measurement of volumetric survey at selected points as monitoring stations within the lease area in Pre-monsoon season & Post Monsoon season respectively. For the said project replenishment study has been done during the post-monsoon season has done by field survey (volumetric survey) method. Firstly Volumetric Survey was done in the proposed mining block. By this method spot RL/level are marked & mapped and sections are drawn for several monitoring locations within the mine area. After that, for post-monsoon season again spot RL/level are marked & mapped on the same location and sections are drawn. The RL(m) observed during Pre-monsoon season of all locations.

Table 7. Volumetric survey measurement

Classification		Code	Quantity of Sand
A)	Mineral Reserves		Cum
1)	Proved Mineral Reserve	111	127000
Total			127000

Replenished quantity of sand = 127000 cum. or 262890 tonnes.

4.3 EXPLORATION

Mining of sand is being done since long time therefore no specific method of exploration is required as the sand, deposited all along the bed and its pale channels, which is very well exposed on the surface. The minerals excavated from the river bed will be replenished gradually during the monsoon season every year. And the area pertaining to paleochannels of the river will be leveled & restored back. Adequate quantity of Sand in reserves is available for meeting consumer demand.

4.4 MINERAL RESERVES

The Mineral reserves have been estimated as per the Indian Standard Procedures. The area of the mining lease is 12.7 Hectares and the average thickness of the river bed minerals estimated as 1.0 mt.

4.4.1 Parameters of Reserve Estimation:

The geological reserves have been estimated as per UNFC guidelines in all the three axis.

Economic Axis (E-1): The Sand is exists with in the entire stretch & having no problem selling in the market. The road is near the Ghat & sand shall loaded into tipper with the deployment of an excavator & transport to various parties. The land is State Govt. land & State Govt. has given its consent for the exploitation of Sand on their expensive land. On the feasibility study, economic viability of deposit has been established sand in economic viable, therefore economic axis has been considered as E-1.

Feasibility Status (F-1): Feasibility study has been carried out & is considered to be feasibility status. A feasibility study provides a preliminary assessment with a level of confidence as compared to that of feasibility study. It has been revealed that exploitation of sand is feasible & economic viable & feasibility axis under UNFC code has been considered as F-1:

Geological Axis: The exposure of sand is seen in the entire stretch & thickness of sand varies 2.5m to 3.0m. Therefore geological axis has been considered as G-1.

Geological Reserves

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.

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

Classification	Code	Quantity of Sand
A) Mineral Reserves		Cum
1) Proved Mineral Reserve	111	127000
Total		127000

Total Geological Reserve = **127000 cum. or 262890 tonnes.**

M/S SANJAY KUMAR
Proprietor

4.4.2 Mineable Reserves:

Mineable reserves have been computed up to 1m depth from surface. The volume multiplied by bulk density (2.07 kg/m3) to get the tonnage.

The minerals excavated from the river bed will be replenished gradually during the monsoon season every year. And the area pertaining to paleochannels of the river will be leveled & restored back.

Table-4.4:- Summary of minable reserves of Block No.- 09 Sand Ghat as below :

BLOCK NO.- 09 SAND GHAT OF KIUL RIVER

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
55-54	494	235	1	116090	240307
Total				116090	240307

Total Mineable Reserve = **116090 CUM or 240307 Tonnes**

- Mineable reserve has been consider 60% approx. of geological reserve after applying the guideline of Enforcement & Monitoring Guidelines for Sand Mining 2020.
- The proposed production grant in LOI is 76200 cum per year which is within the sustainable limit of mineable reserve.
- The BD for Sand has been adopted at **2.07 kg/m^3** [Lab Report of Rapid Test Lab Private Limited]

- **CLASSIFICATION MINERAL RESERVES:**

Sand Ghat	Area (Hect)	Geological Reserves (M3)	Mineable Reserves (M3)	Annual Mineable Permitted Reserve (M3)
Block No.- 09	12.7	127000	116090	76200

The annual extractable RBM comes to 76200 CUM or 157734 Tonnes. It will be replenished after rainy season every year.

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Proprietor

4.5 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.

M/S SANJAY KUMAR
Proprietor

CHAPTER – 5

5.0 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.
- Mining will be done only during the day time and completely stopped during the monsoon season.

Restriction on mining:

i) Sand and gravel shall not be extracted up to a distance of 1 km from major bridges and highways on both sides, or five times (5x) of the span (x) of a bridge/public civil structure (including water intake points) on up-stream side and ten times (10x) the span of such bridge on down side, subjected to a minimum of 250 meters on the upstream side and 500 meters on the downstream side.

ii) No quarrying shall be permitted within 50 (fifty) metres of any public place i.e. cremation ghat or any religious place etc.

iii) No quarrying shall be permitted within 5 (five) metres from both banks of the river.

iv) The quarrying of sand shall be prohibited within 100 (one hundred) metres upstream and downstream from any dam/weir or any other structure erected for irrigation purpose.

v) Sand ghats should preferably be located on the river side embankment. For low embankment less than 6 metres height, quarrying should not be done within 25 metre from toe/heel of the embankment and depth of mining should not be more than 1.00 metre. In case of higher embankments, the distance should not be less than 50 metre and depth of mining should be maximum 1.50 metre and at a distance of 75 metre of more mining depth should be maximum 2.00 metre. In order to obviate the development of flow parallel to embankment, crossbars of width eight times the depth of mining pits spaced at 50 to 60 metres center to center should be left in the mining pits.

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Proprietor

vi) The irrigation outlet shall be maintained at the same level as that of the river bed and in no case the river bed level shall be permitted to be below the irrigation outlet level. No quarrying shall be permitted around the infiltration well/intake well up to a distance of 5 metres.

vii) The extraction of sand shall be permitted only after obtaining a No Objection Certificate from the Water Resources Department in the case of rivers where from irrigation channels are out flowing.

viii) No quarrying of sand shall be permitted in any private land owned by a person other than the settlee unless the settle obtains the consent of the concerned land owner/raiyat.

ix) No quarrying of sand shall be permitted in any area which the State Government notifies as a restricted area.

x) Sand and gravel shall not be allowed to be extracted where erosion may occur, such as at the concave bank.

xi) Mining depth should be restricted to 3 meters and distance from the bank should be ¼th or river width and should not be less than 7.5 meters.

5.2.1 Proposed method of mining:

- Mining activity will be carried out by open cast manual/Mechanically method.
- No OB/ waste material will be produced in river bed. The sand shall be exploited upto depth of 1.0m only. The sand shall be exploited with the deployment of an excavator & filled into Tractors/Trucks & transported to various buyers.
- No drilling/ blasting are required as the material is loose in nature.
- Roads will be properly made and sprayed by water for suppression of dust.
- Roads in the applied area for the movement of loaded tractors/ trucks will not have slopes more than 1 in 16.
- The mined out area shall be replenished each year during monsoon period and maintained in maximum original topography.
- Approach roads from the various blocks as already described earlier will be merging with permanent tar roads on both sides of the river for transportation of the mineral to final destinations.
- The Sand transportation shall be insured after the covering the vehicle Tarpaulin.

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Proprietor

5.3 Year wise Production Schedule:

Year wise annual exploitation of sand from Block No.- 09 Sand Ghat are given below :-

YEAR	Over burden (cum)	ROM Sand (cum)	Saleable Sand (cum)
1ST	-	**76200**	**76200**
2ND	-	**76200**	**76200**
3RD	-	**76200**	**76200**
4TH	-	**76200**	**76200**
5TH	-	**76200**	**76200**

The annual extractable RBM comes to 76200 CUM or 157734 Tonnes. It will be replenished after rainy season every year.

5.4 Conceptual Mining Plan

Mine Applied Area will be worked for Block No.- 09 Sand Ghat. However, as the digging depth will be restricted to 1.0 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: 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 Sand 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.

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5.5 Extent of Mechanization:

The operation will be done by semi mechanized method / OTFM.

Following table gives the list of equipment to be used:

Table-5.2:- List of Equipment's to be used

S. No.	Name of machinery	Capacity	Fuel Consumption	No. of Machinery
1	JCB	1.00 m^3	10 Ltr/hr	1
2	Excavator	2.0 m^3	16 Ltr/hr	1
3	Trucks	12 tonnes	4 Ltr/hr	42
4	Tractors	04 Tonnes	2 Ltr/hr	33
5	Water Tanker	4000 liter	4 Ltr/hr	1
6	Light vehicles	As per requirement	4 Ltr/hr	1

5.6 QUANTITY OF HSD/ FUEL CONSUMPTION PER DAY

Table-5.3:- Quantity of HSD/Fuel to be used

S. No	Machine	Details of fuel (Diesel) requirements	Consumption of Diesel (in lits/ day.)
1.	Excavator & JCB	Number of Excavator & JCB = 1&1 Diesel consumption by 1 jcb & 1 Excavators m/c in one shift working.(i.e-10/15litre/hr) =1*8*10= 80 liters & 1*8*16=128 liters	208 liters
2	Tippers/Tractors	Number of Tractors & Trucks = 42 & 33 Diesel consumption by 142 trucks & 33 Tractors in one shift working (i.e-4ltr/hr.)	1872 liters

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		& (i.e-2 ltr/hr.) =33*2*8 = 528 =42*4*8= 1344	
3	Water Sprinkler	Number of Sprinkler=01 Diesel consumption by Sprinkler in one shift working.(i.e-4ltr/hr). =1*10*4=40 liters.	40 liters
3	Extra	Transport vehicle, super vision vehicle, maintenance vehicle	25 liters
			Total= 2145

5.7 MINERAL PRODUCTION

The mining will be confined to excavation of sand to an extent depending upon availability and market demand. Production is taken tentatively upto a maximum of **157734 TPA** as per marked demand.

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CHAPTER –6

6.0 DRILLING AND BLASTING

No drilling and blasting shall be required to for the exploitation of river sand.

CHAPTER–7

7.0 MINE DRAINAGE:

a) Likely depth of water table based on observations from nearby wells and water bodies:

As per the proposed mining, the working shall be confined up to 1.0 m or above the ground water table whichever comes first. Hence no water is likely to be encountered. So there is no need of any such arrangements.

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CHAPTER-8

8.0 DISPOSAL OF WASTE MATERIAL

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.

Prepared by: Er. Pravin Kr. Sinha, Regd. No. RQP/BIH/SR.NO.20

CHAPTER–9

9.0 USE OF MINERALS

Sand has become a very important mineral for expansion of our society due to its many uses. It can be used for making concrete, filling roads, building sites, brick-making, making glass, sandpapers, reclamations, and etc.

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CHAPTER – 10

10.0 OTHERS

10.1 HAULAGE AND SURFACE TRANSPORT

Mode of transportation of material is by trucks/ Tractors of size of 12 tonnes / 4 tonns capacity have been planned.

Mining area is connected with an unmetalled (approach) road upto the nearest village and thereafter it is metaled road connected to State/National highway. The mine road is adequate to permit easy maneuverability of trucks allowing cross overs and changing points. Water is sprayed two times in a day by tractor mounted water sprinklers until dust remains airborne.

10.2 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 along with anti-venoms to counteract poison produced by certain Snakes / Reptiles, if any.
- Sanitation facility i.e. septic tank or community toilet facility will be provided for the workers.
- Canteen will be made available near the sites.

10.3 WATER REQUIREMENT

Total water requirement for the project is 5.0 KLD, its breakup is as under:-

Table: 10.1- Water Requirement of the proposed project

Sr. No.	Purpose	Water Requirement (KLD)
1.	Dust Suppression	02
2.	Domestic	01
3.	Green Belt	2.0
Total		5.0

10.4 EMPLOYMENT:

The manpower requirement for the proposed project is tabulated below. This manpower is the permanent resource which excludes personnel's coming along with trucks / Tractors.

Table 10.2:- Man power distribution of the proposed project

S. No.	Category	Numbers
1.	Administration	01
2.	Supervisor	01
3.	Skilled	03
4.	Un-skilled	15
TOTAL		**20**

The maximum annual production envisaged is **157734 TPA** which will be achieved every year that implies about 631 tonnes per day 250-working days in a year. That implies 20 workers will meet the required production.

SAFETY PROVISION:

All provisions in safety rules & regulation will be maintained by providing required materials to the employees. The lessee will provide safety shoes, safety helmets to all the employees. There will be no violation of safety provisions.

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CHAPTER–11

11.0 MINERAL BENEFICIATION

Mineral Sand doesn't require processing or beneficiation. The excavated mineral will be directly loaded into the trucks.

CHAPTER –12

12.0 ENVIRONMENT MANAGEMENT PLAN

12.1 SOLID WASTE MANAGEMENT

In this if top soil will be generated, will be used for purposed of applied for green belt development. Small amount of domestic waste will be generated by the workers at the site, which will be disposed off through proper municipal way. No other waste generation is expected.

12.2 PLANTATION

The area of the proposed project lies in the river bed and devoid of any forest land.

Mining activities in River Bed blocks will not cause any harm to riparian or aquatic vegetation as mining will be only in the dry river bed portions of the river leaving safety distance from the bank. Hence it proposed to plant trees along the banks (wherever possible), along the haul road sides or near the civic amenities in consultation with village authority/local bodies.

In river bed mining cases plantation will be done at the river banks. It is proposed to have plantation along the haul road sides on both sides to provide cover against dust emission and also to act as noise absorber. Plantation will also be carried out as social forestry programme in villages, school/ and the areas allocated by the village authority/local bodies. Every year 26 trees of will be planted with various types of species. List of species is recommended for plantation.

Native plants like Mango, Neem, Kadamb, Kathal, Peepal, Gulmohar, and other local species will selected in suitable combination, so that can grow fast and also have good leaf cover. It is proposed to plant.

12.3 ENVIRONMENT MANAGEMENT PLAN

1.	Top soil storage, preservation and utilization	Present mining area is river bed, therefore no generally no top soil is present, if found then quantities of top soil to be generated will be stacked separately, preserved and used for purposed of plantation therefore no proposal has been envisage for storage, preservation & utilization.
2.	Waste dump management	No waste will be generated during mining whatever material is collected is transported in its original shape. Hence no waste management is required. Small amount of domestic waste is expected, which will be disposed off in a proper way. No

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		waste will be thrown into the streams or left on the banks.
3.	Plantation programme	Plantation will be done along both sides of roads and civic amenities in consultation with the local authorities. social forestry programme will also be conducted in the nearby villages
4.	Quality of air	24 hourly samples twice a week for one month in each season except monsoon will be collected at the mine site and nearby villages and analyzed.
5.	Noise	Excavators used for mining & transportation vehicles used for dispatch of minerals are source of noise pollution at mine site. Hence periodical noise monitoring will be done. Ear muffs/protective equipments will also be provided for safety of the workers.
6.	Quality and make of water including surface and ground water	Mining will not have any impact on surface and ground water, however monitoring of parameters will be done once in each season.
7.	Soil	No major impact on soil due to mining operations is expected. Soil parameters will be monitored once in two years.
8.	Topography & drainage	Mined out area will be replenished every year during monsoon period in each stretches in each block in case of river bed blocks. Hence as such no topographical impact will be seen. A buffer zone will be left on either side of banks as safety measure. There is no stream crossing through the applied area which would show impact on drainage pattern.
9.	Local transport infrastructure	Trucks/dumpers are main vehicles running on the road for mineral transportation. The present road network is adequate to handle the load of this project. Water sprinkling on the haul roads/link roads will be done two times in a day to keep the dust suppressed. Also proper parking and traffic management will be followed.

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CHAPTER–13

CONCLUSION:

The proposed project involves collection of sand from inactive channel of river bed of Kiul river. Safety distance will be left intact to avoid bank erosion. Mining activity will be done except monsoon season. All necessary measures will be taken care to save environment and for safety purposes. Besides this extraction of sand every year will reduce the chance of flood level by removing the deposited mineral. This is very essential in order to prevent widening of the riverbeds and to prevent flooding off and damage to the adjoining areas. The sand extracted is in high demand in the local market which is used in making bridges, road & Building Material, etc.

This project operation will provide livelihood to the poorest section of the society. It provides employment to the people residing in vicinity directly or indirectly by the project. After all the proposed project will increase developmental activities and employment opportunities.

***

M/S SANJAY KUMAR
Proprietor

PROGRASIVE MINE CLOSURE PLAN

M/S SANJAY KUMAR

Proprietor

PROGRESSIVE MINE CLOSURE PLAN

1.0. Introduction:

1.1	Settlee Name & Full address Phone. No. E-Mail ID	Sanjay Kumar S/o Ramashray Singh Add.- New Court Area Naya Bazar, Lakhisarai. 9110965575. -
1.2	Letter no. / date of lease execution & lease period	District Magistrate issue LOI on letter no. 1557/M Dated. 08.12.2022 for a period of 05 years (Annexure No. -1)
1.3	Settlee post/social status	Private
1.4	Mineral or Minerals which the Settlee intends to mine	Sand
1.5	Applied area for mining lease	Block No.- 09 Sand Ghat Lease has an applied area of 12.7 Hectare.
1.6	Name & address of RQP & Regd. No. Mobile No. E-mail ID	Er. Pravin Kr Sinha Reg. No. - RQP/BIH/SR.NO.20 LETTER NO.3825 DATED 07/11/2019 **Consultant** P & M Solution 201,Mangal Market Raja Bazar, Pastna 9889024004 & 7542949027 indusminingbihar@gmail.com
1.7	RQP Certificate	RQP certificate copy attached as **Annexure 2**
1.8	Name of the Prospecting agency	The base data is collected from various geological reports of the Department of Mines & Geology and local authorities as well as detailed prospecting of the area is carried out by the RQP.
1.9	Status of Environmental clearance	After Mining Plan approval then Settlee shall submit application to state Environment Impact Assessment Authority (SEIAA) of Bihar for environment clearance.
2.0	Date of Survey	10.12.2022

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b). Location: Block No.- 09 Sand Ghat fall in Mauza– Nongarh, Chanan, District-Lakhisarai (Bihar). The location plan is enclosed **(Plate No. 1)**

c). Extent of Lease area: **12.7 Hectares**

d). Type of lease area: Total area is waste land & it is free from forest land

e). Present land use pattern: The existing land use is given below:

Sr. No.	Land use	River Bed (Ha)	Forest Land (Ha)	Barren land (Ha)	Grazing Land (Ha)
1	Mining pits Quarry	-	-	-	-
2	Approach Road	-	-		-
3	Dumps	-	-	-	-
4	Office, Resht Shelter etc.	-	-	-	-
5	Balance undisturbed land	12.7	-	-	-
	Total	**12.7**	-	-	-

f). Method of mining and mineral processing:

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

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Proprietor

1.1. Reasons for Closure:

The "closure plan is a plan by which reinstate condition can be created, so that justification to the mother earth can be done" said by **James E. Hansen**. In the case of river bed mining, the excavated sand gets replenished during every monsoon and the area pertaining to paleochannels of the river will be levelled & restored back to its original topography. More or less, the river bed maintains its previous form, such that the main stream of river remains unchanged.

According to experience and rough estimation of the State Government whatever quantity of minor minerals is extracted from the said area during the year will be replenished every year by the River itself on account of its flow and velocity.

At present there is no foreseeable reason regarding closure of mine. The progressive mine closure plan is being submitted.

1.3. Closure plan preparation:

a). Name and address of the Lessee:

Sanjay Kumar
S/o Ramashray Singh
Add.- New Court Area Naya Bazar, Lakhisarai.
Mob : 9110965575.

b). Name, address & Registration No. of R. Q. P.

Er. Pravin Kr Sinha
Reg. No. - RQP/BIH/SR.NO.20 LETTER NO.3825 DATED 07/11/2019
Consultant
P & M Solution
201,Mangal Market
Raja Bazar, Patna
Mob. No.- 9889024004 & 7542949027
Email ID: indusminingbihar@gmail.com

c). Name of the executing agency:

The Proponent shall execute himself the provision of mine closure plan.

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

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Proprietor

2.0 Mine Description:

Topography and general geology and local / mine geology of the mineral deposit including drainage pattern

The area represents a rough and rugged topography. A detailed geological map on 1:1000 scales with contour interval. The area shows a general slope toward N-E while the highest RL of 47.2 m occurring on the South –East side of the area along boundary pillar, whereas the lowest RL of 40.7 m within the lease area is found along N-E slope near boundary line. The surface plan of the area.

ii) GEOLOGY OF THE AREA :-

The Archaeans are the oldest rock formation in the state. The most predominant rocktype is mainly of gneisses and granitic rocks with lesser amount of schists, quartzites, basicintrusives and pegmatoides. They are exposed in Aurangabad, Gaya, Nawada, Jamui, Bhagalpur and Banka districts.

Based on broad geomorphic parameters such as relief, drainage pattern and geology, Bihar may be divided into three geomorphic domains.

(i) Uplifted block of hilly southern highlands comprising the northern part of the Kodarma-Santhal Pargana planation surface, falling in parts of Bihar, northern fringe or escarpment of Chotanagpur plateau and Rohtas plateau.

(ii) The transition zone between the southern highlands and the Great Ganga Plains, constituting the central Bihar Plains, and

(iii) The Ganga foredeep of the North Bihar Plains bounded by the rising Himalaya inthe north and the Ganga R. in the South

LOCAL GEOLOGY OF THE AREA:

Kiul River is a tributary of Ganges. It originates in Giridih of Jharkhand and flows through Lakhisarai, Sheikhpura and Jamui districts of the Indian state of Bihar and joins Harohar river in the Diara region. Kiul originates from the Tisri Hill Range in Kharagdiha police station area of Giridih district. After forming the boundary of the district for a short distance it enters Jamui district through a narrow gorge near the Satpahari hill. It first flows in an easterly direction close to the southern base of the Girdheswari Hills. It turns northward at their eastern extremity and passes near the town of Jamui. Two miles south of Jamui it is joined by Barnar, below this point it receives the Alai, a mountain stream and near Jamui railway station it is joined by the Anjan. It then flows north-east up to Lakhisarai, It

M/S SANJAY KUMAR
Proprietor

passes below the railway bridge between Kiul junction and Lakhisari station and is joined a few miles north of that place, near RahuaGhat, by the Harohar (Halahar or Harhobar), a continuation of the Sakri River. After this it turns due east and falls into the Ganges near Surajgarha. Until it meets the Harohar the Kiul has broad sandy bed and in some places is as much as half a mile wide, though it contains very little water in summer.

DETAILS OF EXPLORATION:

a) Already carried out in the area:

No exploration has been carried out as sand lies all over the area & average thickness of sand is 1.0 m & area replenish every during the monsoon period. Therefore is no exploration has been carried out.

b) Proposed to be carried out:

Sand average thickness of 1.0 m lies all over the area & area replenish every during the monsoon period. Therefore no proposal of exploration has been given.

2.2 Reserves:

BLOCK NO.- 09 SAND GHAT

Geological Reserves : -

Classification	Code	Quantity of Sand
A) Mineral Reserves		Cum
1) Proved Mineral Reserve	111	127000
Total		127000

Total Geological Reserve = **127000 cum. or 262890 tonnes.**

Mineable Reserves: -

The mineable reserves are given in **Table Nos. 4**

Block No.- 09 Sand Ghat

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
55-54	494	235	1	116090	240307
Total				116090	240307

Total Mineable Reserve = **116090 CUM or 240307 Tonnes**

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- Mineable reserve has been consider 60% approx. of geological reserve after applying the guideline of Enforcement & Monitoring Guidelines for Sand Mining 2020.
- The proposed production grant in LOI is 76200 cum per year which is within the sustainable limit of mineable reserve.
- The BD for Sand has been adopted at **2.07 kg/m^3** [Lab Report of Rapid Test Lab Private Limited]

- **CLASSIFICATION MINERAL RESERVES:**

Sand Ghat	Area (Hect)	Geological Reserves (M3)	Mineable Reserves (M3)	Annual Mineable Permitted Reserve (M3)
Block No.- 09	12.7	127000	116090	76200

The annual extractable RBM comes to 76200 CUM or 157734 Tonnes. It will be replenished after rainy season every year.

2.3 Mining Method:

Existing Method of mining:

It is fresh grant case of mining lease & at present no mining is being carried with the applied area.

b) Proposed method of mining:

- Mining activity will be carried out by open cast semi mechanized/OTFM method.
- No OB/ waste material will be produced in river bed. The sand shall be exploited upto depth of 1.0 m only through. The sand shall be exploited with the deployment of an excavator & filled into Tractors/Trucks & transported to various buyers.
- No drilling/ blasting are required as the material is loose in nature.
- Roads will be properly made and sprayed by water for suppression of dust.
- Roads in the applied area for the movement of loaded tractors/ trucks will not have slopes more than 1 in 16.

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- The mined out area shall be replenished each year during monsoon period and maintained in maximum original topography.
- Approach roads from the various plots as already described earlier will be merging with permanent tar roads on both sides of the river for transportation of the mineral to final destinations.

2.4 Mineral beneficiation:

No mineral beneficiation will be under taken for next five years. The sand shall be exploited semi mechanised with shovel tractor trolley/tippers combination & transport to parties.

3.0 Review of implementation of mining plan / scheme of mining including five years progressive closure plan up to the final closure of mine:

At is fresh grant case of mining lease it is therefore premature to make any comments about review of implementation.

4.0 Closure Plan:

4.1 Mined out land:

Mining is proposed in one block. The mining shall be carried out during post monsoon season & depth of mining shall restricted 1.0m. Mining operation shall be suspended during monsoon period. The mined out pit shall be replenished during the monsoon period by sand and silt & levelled it. After over the monsoon period the replenish material shall be exploited manually as well as by means of an excavators & this process will continue.

The area already degrades due to mining & likely to be used during next five years is given below:

Activities	Area already used (Ha)	Area likely to be used in mining (ha)
Pits & quarries	-	12.7
Approach road	-	-
Top soil Stack	-	-
Interburden dump	-	-
Backfilled pit	-	-
Total	-	12.7

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(A) Mining:

Sl.No.	Activities	Area(Ha)
1.	Area already broken up	-
2.	Area already backfilled /reclaimed	-
Sl. No.	**Activities**	**Area(Ha)**
1.	Additional area proposed to be broken during next five years	-
2.	Additional area proposed to be replenished with flood water	-

(B) Dump:

Sl.No.	Activities	Area(Ha)
1.	Area already covered by dump	Nil
2.	Additional area to be covered by soil stack	-
3.	Additional area to be covered by interburden dump.	Nil
4.	Dump area to be covered by protective measures	-

(C) Plantation:

Sl.No.	Activities	Area(ha)
1.	Area already covered under plantation	-
2.	Area proposed to be covered under plantation in next five years (with in area)	-
	Total	-

4.2 Water Quality Management:

No ground water bodies exist with in the area & no seasonal Nalla exists with in the area. The rain water accumulates in the pit & water percolates in to ground water.

Further no significant impact on water quality is anticipated as material exposed will be Sand & its shall very feebly react with water that too when water becomes acidic. Even of reaction takes place it gives arise to increased temporary hardness of water. Water is being supplied from the Tubewell.

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Prepared by: Er. Pravin Kr. Sinha, Regd. No. RQP/BIH/SR.NO.20

4.3. Air Quality Management:

The mining shall be carried out semi-mechanized/OTFM with use of excavators/JCBs truck /tractors combination or Manually etc. No adoption of drilling & blasting mining shall be carried out in shallow depth.

No doubt the mining in this remote area will deteriorate the air quality. The base line values are too low due to remoteness of the area with our past experience. In this kind of terrain, the SPM, SO2 and NOX will always below 100, 10 & 10 microgram per meter cube respectively. Air quality monitoring shall be conducted once in a year as per CCOM'S circular No 3/92.

4.4. Waste management:

No waste shall be generated due to mining activities. All quantities of sand to be generated shall be bold in the local market. Therefore no proposal of waste management has been envisaged.

4.5 Top Soil Management:

No soil shall be generated during plan period & no proposal has been envisaged for its separate stacking & this management.

4.6. Tailing Dam Management:

No tailing dam is proposed in the soapstone mine.

4.7. Infrastructure:

No infrastructure facilities like aerial ropeway, conveyor belts, building & structure, water treatment plant, transport & water supply sources are present within the lease area. Therefore no utilization & their physical stability & maintenance will be required. Also no infrastructure facilities like telephone line, water pipe line, sewer line, gas pipe line, electrical cables, culvert, bridges are not existing within the lease area. So question does not arise for their restoration. The approach road passed within the lease area & lessee shall maintain it during PMCP period

4.8. Disposal of Mining Machinery:

It will be opencast semi mechanised mine. No disposal of mining machineries shall be envisaged during plan period.

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4.9. Safety and Security:

1. Each worker shall be provided with helmets & safety shoes.
2. Hanging of loose materials shall be removed from mine faces.
3. The mining area shall be properly fenced to avoid any inadvertent entry in to mining pit.
4. Working hours shall be displaced at conspicuous places.

4.10 Disaster Management and risk assessment:

The mining is proposed in a gentler agricultural field. The mining will go up to the economical depth of 1m therefore, no disaster management and risk assessment shall be observed. However during monsoon period the area shall be properly fenced with barbed wire to avoid any inadvertent entry of any live stock.

5.0. Economic repercussions of closure of mine and manpower retrenchments:

All the workers being employed are contractor labours. An any industry will provide direct and indirect employment. The local residents will earn tremendous amount of money due to mining activities. It will change their life style. Due to closure of mine, it will create very negative impact on the economy of the workers for their survival. Those earning good money will get some occupation for survival of their families. The literate workers will move here and there for the search of job. In the overall view the closure of mine will give very bad impact on the society and surrounding areas.

5.1 Local residents of nearby villages will be employed in the mine. The family occupation is most by farming. Few of them occupation carpentry & masonry.

5.2 The lessee pay each year about 5,000 to 10,000 as a compensation for the sustenance of the few workers family.

5.3 About 30% of the workers employed in mine are independent but they are controlled depended by their family members.

5.4 The local residents will be employed in the mining operations, and allied activities related to mining operations.

5.5 During mining operations the land owners & society of the area shall earn lucrative amount of money from direct & indirect activities. Individual land owners shall also earn good amount of money in terms of royalty. Most of them will spend money to establish other business also. After mining, the total land shall be backfilled & agricultural activities shall be recommended. No repercussion should be observed during the closure of mine.

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6.0 Time Scheduling for abandonment:

It is proposed in the mining plan that mining will open from lower levels and subsequently advance towards higher elevations so that concurrent reclamation will be under taken to restore the topography of area. The mined area will be replenished during the monsoon period.

The year wise schedule of completion of quantities is given below:

Activities	YEAR				
	I	II	III	IV	V
Toe wall along Soil stack	-	-	-	-	-
Backfilling (Cum)	-	-	-	-	-
Plantation (No. of sampling, out side the area)	26	26	26	26	26

The tentative cost of implementation of activities during next five years is given below:

Sl. No.	Activities	Year					Total amount on Rs.
		I	II	III	IV	V	
1.	Toe wall (soil stack Rs. 40/m)	-	-	-	-	-	-
2.	Retaining at the edge of backfilled wall pit (Rs. 50/m)	-	-	-	-	-	-
3.	Plantation (Rs. 1000/- sapling with in the area)	26	26	26	26	26	130000
	Total						**130000**

The tentative cost (In Rs) of implementation of activities during next five years is given below:

Tree guard @ 800 per unit	800
Per plant species cost	100
Average Water demand cost per species Per Year	100
Total	1000

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7.0 Abandonment Cost:

The tentative cost for implementation of protective and rehabilitation measures, the proposal given in the mining plan for next five years period is as under:

Activity	Year						Rate In Rs.	Amount In Rs.
	I	II	III	IV	V	Total		
i) Toe wall at the base and side of soil stack (mtr)	-	-	-	-	-	-	40/m	-
iii) Retaining wall at the edge of backfilled pit (m)	-	-	-	-	-	-	-	-
iv) Plantation (no. of sapling with in the area.)	26	26	26	26	26	130	1000/-	130000
v) Reclamation (Cum.)	-	-	-	-	-	-	40cum	-
Total								**130000**

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8.0 Any other information:

Community Development: The expensed increased towards the socio-economic development is given below:

Proposed Action Plan Towards socio economic development	First Year to Fifth Year	
	Expenditure proposed (in Rs.)	Expenditure in occurred (in Rs.)
General Development of the area	-	-
i) Housing	50,000	-
ii) Water Supply	25,000	-
iii) Sanitation	20,000	-
iv) Health, Safety & Medical Facilities	30,000	-
Education & Training	30,000	-
Employment to local inhabitants; Land owner compensation; Supervisor & Headers etc.	1,00,000	-
Public Transportation & Communication	20,000	-
Recreation & other sports activities	20,000	-
Expenditure for environment management	15,00,000	-
Others (Compensation to land owners)	80,000	-

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9.0 Financial Assurance:

The financial assurance has been calculated on the basis of following parameters:

Sl. No.	Head	Area put on use at start of plan (In Ha)	Additional requirement during plan period. (In Ha)	Total (in Ha)	Area considered as fully reclaimed & rehabilitated (In Ha)	Net area considered for calculation (In Ha)
1.	Area under mining	-	12.7	12.7	12.7	0
2.	Storage for top soil	-	-	-	-	0
3.	interburden/ dump	-	-	-	-	0
4.	Mineral storage	-	-	-	-	0
5.	Infrastructure (Workshop, administrative building etc.)	-	-	-	-	0
6.	Approach Road		-	-	-	-
7.	Railways	-	-	-	-	0
8*.	Green Belt	-	-	-	-	-
9.	Tailing pond	-	-	-	-	0
10.	Effluent Treatment Plant	-	-	-	-	0
11.	Mineral Separation Plant	-	-	-	-	0
12.	Township area	-	-	-	-	0
13.	Others to specify (retaining wall + toe walls	-	-	-	-	-
	Grand Total		12.7	12.7	12.7	-

The total mined out area shall be replenished each year during monsoon period & no broken area will be remained in the applied area. Therefore, it is not possible to calculate financial assurance at this stage.

Date:

Place: Lakhisarai

*Plantation will be done along both sides of roads and civic amenities in consultation with the local authorities

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Proprietor

ANNEXURE

M/S SANJAY KUMAR

Add.- Naya Bazar, Court Area, Lakhisarai (Bihar).

Mob No.- +91- 9110965575 **GSTIN : 10CACPK2787G1ZY**

Ref. No.- Date:

AUTHORISATION LETTER BY THE APPLICANT/ LESSEE

I,Sanjay Kumarhereby authorise ***Er. Pravinkumar Sinha***,Reg. No. - RQP/BIH/SR.NO.20 Letter No. 3825 Dated 07/11/2019 to prepare the Mining planSubmitted underRule (17) of Bihar Minerals (concession, prevention of illegal transportation & storage) Rules 2019 in respect of Sanjay Kumarat over an area of 12.7Hectarefor mineral(s) for Kiul River Block No.- 09 Sand Ghat Mauza– Nongarh, Chanan, District- Lakhisarai (Bihar).

I requestThe Director, Department of Mines & GeologyPatna, Bihar to make further correspondence regarding modification and to collect the approved copies of the aforesaid mining plan with the said recognized person on his following address:

Name of RQP : Er.Pravin Kr. Sinha
Reg. No. - RQP/BIH/SR.NO.20
Letter No. 3825 Dated 07/11/2019

Address of RQP

:Consultant :
P & M Solution
201,Mangal Market
Raja Bazar, Patna (Bihar)
9889024004 & 7542949027
indusminingbihar@gmail.com

Proponent,

M/S SANJAY KUMAR

Sanjay Kumar
S/o Ramashray Singh
Add.- New Court Area Naya Bazar,
Lakhisarai.

Place :

Date :

Certificate

1. Certified that the provisions of mines Act, Submitted under Rule (17) of Bihar Minerals (concession, prevention of illegal transportation & storage) Rules 2019 made there under have been observed in Block No.- 09 Sand Ghat in Mauza– Nongarh, Chanan, District- Lakhisarai (Bihar). and wherever specific permissions are required, the lessee will approach concerned authorities for granting permission.

2. The information furnished in Block No.- 09 Sand Ghat is true and correct to the best of my knowledge.

(*Pravin Kumar Sinha*)

Regd.No: RQP/BIH/SR.NO.20

Place: - Patna

Date:-

(Approved RQP under Bihar Government)

20	Pravin Kumar Sinha	7542949027	B.E (Mining)	Rs. 2,000/- per Hectare (Each Block Mining Plan - Rs. 30,000/-)		201,2nd Floor,Mangal Market,Raja Bazaar, bailey Road, Patna-14
21	Md. Tauseef Warsi Greenera Mining & Envirotech Pvt. Ltd.	9534027112	M.Sc. (Geology)	Rs. 5,000/- (Excluding GST)		Greenera Mining & Envirotech Pvt.Ltd.,205 Mangal Market,Raja Bazar,Bailey Road Patna-800014
22	Prabhat Kumar Srivastava	8827477206	B.E(Mining)	Rs. 8,000/-		Flat No-101, Road No.-01, Boodh Nagar, Chiriya Tard, Postal Park , Patna-800001
23	Ashok Kumar Singh	8766859804	Mining Engineer	Rs. 8,000/-		C/o Shri Ram Prasad Singh, Mohalla - Mogal Kuan, P.O. - Sohsarai, P.S. - Sohsarai, Dist.- Nalanda, Bihar- 803118
24	Sandeep Kumar	8126253120	M.Sc. (Applied Geology)	Rs. 10,000/-		Anpurna Bhavan , C/O Ravi Kishan, Sundar Nagar, Lohia Path , Jagdeo Path , Patna - 800014 (Bihar)
25	United Exploration India Pvt. Ltd.	9431208782 9934304369	Required Qualification of the employees attached	Rs. 5,200/- (inclusive all Taxes)		301,2nd Floor ,Sahid Rajendra Singh Complex,Anishabad , Patna-800002
26	Rian Enviro Pvt. Ltd	9431289638	Required Qualification of the employees attached	Rs. 5,000/- (inclusive all Taxes)		202,2nd Floor,Mangal Market,Raja Bazar,Sheikhpura Patna -800014
27	Ascenso Enviro Pvt. Ltd.	9204207920	Required Qualification of the employees attached	Rs. 4,750/- (inclusive all Taxes)		401,4th Floor ,Mangal Market,Raja Bazar,Sheikhpura,Patna-800014
28	M/s Baghel Environment & Waste Management Pvt. Ltd.	9431042532	Qualifications of candidates are attached	As decided by the department of Mines & Geology, Govt. of Bihar		Baghel Environment & Waste Management Pvt. Ltd. ,1st Floor, 27, Guru Sahay lal Nagar, Road No. 2, Magistrate Colony, Ashiyana Nagar, Patna - 800025, Bihar
29	Gramin Lok Seva	9934452711	Qualifications of candidates are attached	Rs. 7,000/-	Note - 1. Minimum rate for a Sand Block - INR 25,000/- 2. Maximum rate for a Sand Block - INR 60,000/- OR As decided by the Department of Mines & Geology, Govt. of Bihar	27, Guru Sahay Lal Nagar, Magistrate Colony, Ashiyana nagar, patna- 800025, Bihar
30	Praneja Envirocare & Management Pvt. Ltd.	9708251824	Qualifications of candidates are attached	Rs. 10,000/- (Excluding GST @18%)	Remarks - Fee should not be less than 20,000 or more than 50,000 thousand for single block. (Excluded GST) OR As decided by the Department of Mines & Geology, Govt. of Bihar	103, Bhagwati kunj apartment, Road No. - 10, Anand Vihar Colony, Rukanpura, Patna (Bihar)- 800014
31	Institute of Environment and Eco Development	7004620817	Details Of Qualification Attached	Rs. 10,000/- (Excluding GST)	Rate will be negotiable as per direction from Department of Mines & Geology, Govt. of Bihar	Admin Office--Ground floor, Shyam Nagar Colony, Maurya Path, Bailey Road, PO-LNT College,Patna- 800014
32	ENV Developmental Assistance Systems (India) Pvt. Ltd.	5224007470 9335913139	Details Of Qualification Attached	Rs. 2,750/- (inclusive all Taxes)		Prabha Niketan, road No.-13,Patel Nagar, Near Petrol Pump,,Patna-800029

ज्ञापांकः– 3825 /एम0, दिनांक– 07/11/19

प्रतिलिपिः– माननीय मंत्री के आप्त सचिव/प्रधान सचिव के प्रधान आप्त सचिव/निदेशक कोषांग/उप निदेशक (मु0)/सहायक निदेशक (मु0)/खनिज विकास पदाधिकारी (मु0) को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

7/11/19

सरकार के अवर सचिव

(Accreditation Certificate)

1.	1	Mining of minerals including opencast / underground mining	A	1 (a) (i)
2.	3	River Valley projects	B	1 (c)
3.	8	Metallurgical industries (ferrous & non-ferrous)	B	3 (a)
4.	34	Highways,	A	7 (f)
5.	38	Building and construction projects	B	8 (a)
6.	39	Townships and Area development projects	B	8 (b)

1.1.3 EIA Coordinators (ECs)

Sl. No	Name	Sectors			Cat.	Remarks
		Applied	Recommended	Approved		
In-house						
1	**Jatin Kumar Srivastava**	1	Yes	Yes	B	Opencast only.
2	**Pravin Kumar Sinha**	1	Yes	Yes	B	None
Empanelled						
3	**Tapan Majumdar**	1	Yes	Yes	A	With an observation.
4	**Mayank Kumar**	3	Yes	Yes	B	None
		34	Yes	Yes	A	
		38	Yes	Yes	B	
		39	Yes	Yes	B	
5	**Vikas Chand Tripathi**	8	Yes	Yes	B	None
		38	Yes	Yes	B	With an observation.

1.1.4 Functional Area Experts (FAEs)

Sl. No	Name	Functional Areas (FA)			Cat.	Remarks
		Applied	Recommended	Approved		
In-house						
1	**Jatin Kumar Srivastava**	SC	Yes	Yes	B	None
		NV	Yes	Yes	B	
		WP	Yes	Yes	B	
		EB	Yes	Yes	B	
2	**Pravin Kumar Sinha**	GEO	Yes	Yes	B	None
3	**Amit Kumar**	SHW	Yes	Yes	B	SW only
		AP	Yes	Yes	B	With an observation.
		WP	Yes	Yes	B	
4	**Manoj Kumar Pandey**	EB	Yes	Yes	B	None
5	**Hussain Ziauddin**	SHW	Yes	Yes	B	HW only
		WP	Yes	Yes	B	None
6	**Abhay Nath Mishra**	SE	Yes	Yes	B	With an observation
Empanelled						
7	**Tapan Majumdar**	GEO	Yes	Yes	A	None
		HG	Yes	Yes	A	
8	**Mayank Kumar**	EB	Yes	Yes	B	None
9		SHW	Yes	Yes	B	SW only.

जिला खनन कार्यालय, लखीसराय।

पत्रांक– 1559 /एम0, दिनांक 08/12/2022 /

प्रेषित,

संजय कुमार,
पिता– रामाश्रय सिंह,
पता– न्यू कोर्ट एरिया नया बाजार, लखीसराय।
मो0 नं0– 9110965575

विषय :– लखीसराय जिलान्तर्गत किउल नदी ब्लॉक नं0– 09 की बन्दोबस्ती हेतु सैद्धान्तिक स्वीकृत्यादेश निर्गत करने के संबंध में।

महाशय,

उपर्युक्त विषय के संबंध में सूचित करना है कि लखीसराय जिलान्तर्गत किउल नदी ब्लॉक नं0–09, मौजा–नोनगढ़, वानन की ई निलामी द्वारा बन्दोबस्ती में संजय कुमार, पिता– रामाश्रय सिंह, पता– न्यू कोर्ट एरिया नया बाजार, लखीसराय द्वारा उच्चतम बोली की राशि–12,11,58,000/– (बारह करोड़ ग्यारह लाख अंठावन हजार) रूपये मात्र की बोली लगाकर नीलामी ली गई है। नीलामी की राशि का 25% प्रतिभूति राशि (अग्रधन की राशि को समायोजित करते हुए) कुल– 2,74,32,000/–(दो करोड़ चौहत्तर लाख बत्तीस हजार) रू0 मात्र जमा करने के उपरांत सैद्धान्तिक स्वीकृत्यादेश निर्गत किया गया है।

1. बालू खनन क्षेत्रों का विवरण निम्न प्रकार है :–

क्रं0 सं0	नदी, घाट का नाम एवं पता	Area (Hectare)	GPS CO- ORDINATES LATITUDE & LONGITUDE		
1	किउल नदी, ब्लॉक नं0–09, मौजा– नोनगढ़, वानन, लखीसराय।	12.7	A	25° 3'48.24"N	86° 9' 8.22"E
			B	25° 3'30.13"N	86° 9' 12.62"E
			C	25° 3'33.26"N	86° 9' 4.89"E
			D	25° 3'39.76"N	86° 8' 59.42"E
			E	25° 3'46.63"N	86° 8' 59.32"E
2	भीमबांध वन्य प्राणी आश्रयणी के ESZ से दूरी	3.6km			
3	सुरक्षित क्षेत्र/वन अभ्यारण्य क्षेत्र/पक्षी अभ्यारण्य/वन्य जीव आश्रयण क्षेत्र से दूरी	5.8 km			
4	बालूघाट/बालूखण्ड से 500 मीटर के अन्दर खनन पट्टा क्षेत्र की स्थिति	हाँ {ब्लॉक –08, रकबा–33.2 हेक्टेयर; ब्लॉक– 10, रकबा–39.3 हेक्टेयर}			
5	पुरातात्विक स्थल से दूरी	लागू नहीं			
6	खनन योग्य मात्रा	76200M³			
7	मौजा	नोनगढ़ / 186			
8	खाता	295			
9	खसरा	555			

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

पर्यावरणीय स्वीकृति एवं अन्य आवश्यक स्वीकृति प्राप्त करने में किसी भी प्रकार की देरी के लिए सफल डाकवक्ता स्वंय जिम्मेवार होंगे एवं इस संबंध में किसी भी प्रकार की क्षतिपूर्ति के लिए कोई भी दावा मान्य नहीं होगा।

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

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

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

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

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

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

8. निविदा के निम्नलिखित शर्तों एवं बन्धेजों का अनुपालन सुनिश्चित करना होगा।

(i) निविदादाता/सफल डाकवक्ता/बंदोबस्तधारी द्वारा ई–मेल के माध्यम से किया गया पत्राचार ही मान्य होगा।

(ii) बन्दोबस्ती लेने के बाद सभी बालूघाटों के लिये बालू के उत्तोलन कार्य में संलग्न सभी सहयोगी व्यक्तियों/प्रबंधकों की सूची, पूर्ण पता एवं फोटो के साथ एक माह के अन्दर समाहर्त्ता को उपलब्ध कराना एवं पोर्टल पर अपलोड करना होगा। यदिइसमें कोई बदलाव होता है तो उसकी भी सूची अविलम्ब पोर्टल पर अपलोड/उपलब्ध करायेंगे।

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

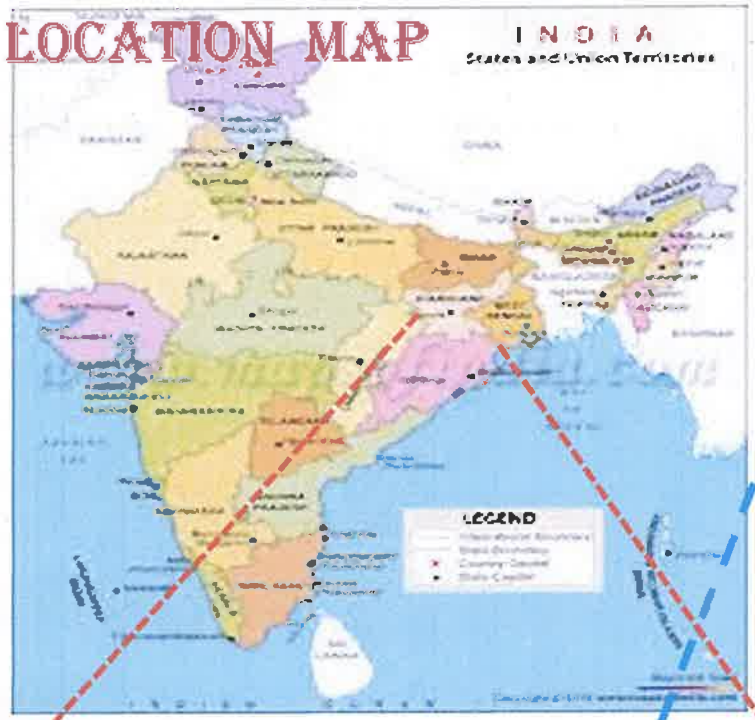
(iv) बंदोबस्तधारी श्रम विधियों के प्रावधानों के अनुसार आश्रय गृह, पीने का पानी, शिशु गृह (क्रेचेज) तथा फर्स्ट एड किट की व्यवस्था संबंधित बालूघाटों में लगे श्रमिकों के लिए करेगा।

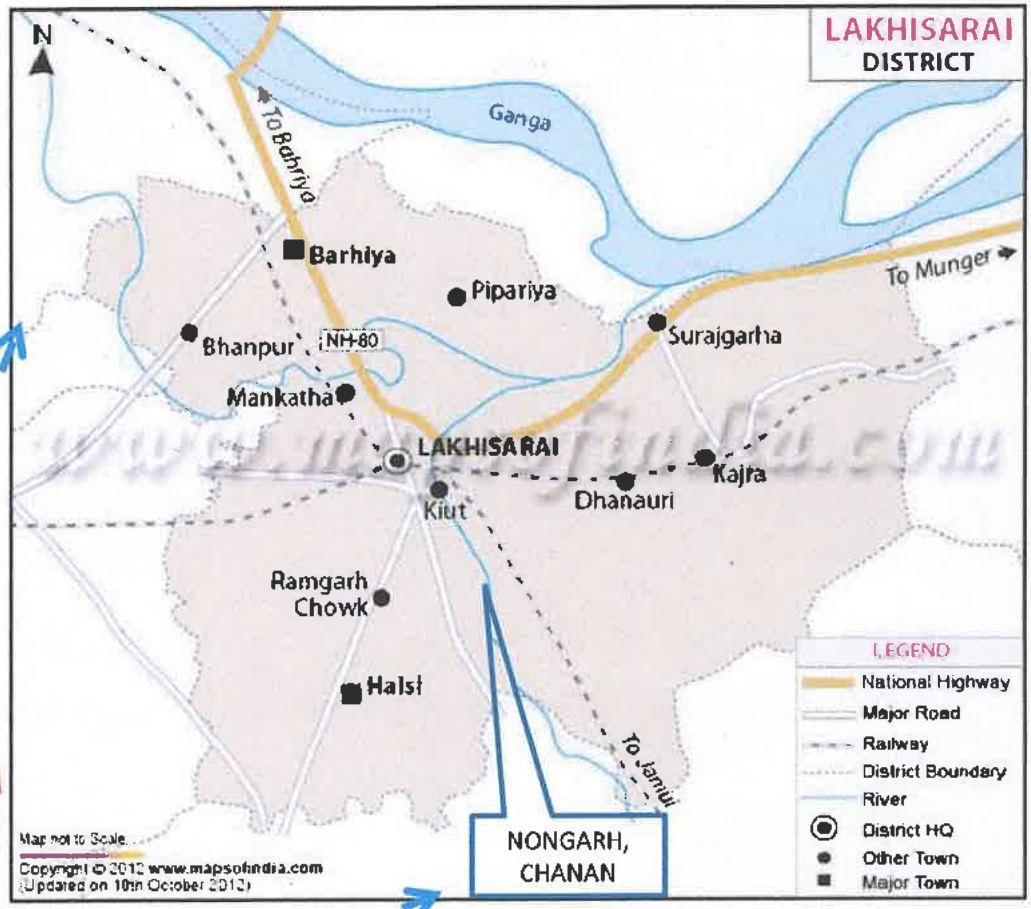
(v) बंदोबस्तधारी संबंधित क्षेत्रों का निरीक्षण करेगा तथा स्वयं/ अथवा अपने द्वारा अधिकृत प्रतिनिधियों के माध्यम से बालूघाटों का प्रचालन करेगा। किसी रूप में किये गये उपपट्टा (सबलेटिंग) के लिए बंदोबस्ती रद्द कर दी जाएगी। बालूघाटों/नदी तल तक बालू परिवहन के प्रयोजनार्थ पहुँच पथ (अप्रोच रोड़) का निर्माण बंदोबस्तधारी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

(vi) बालूघाट की सुरक्षा की जिम्मेदारी बंदोरतधारी की होगी।

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

PLATES





M/S SANJAY KUMAR
Proprietor

PLATE No.1

LOCATION PLAN
KIUL RIVER BLOCK NO.- 09 SAND GHAT (AREA-12.7) MAUZA– NONGARH, CHANAN, DISTRICT- LAKHISARAI (BIHAR).
SETTLEE:- SANJAY KUMAR
PREPARED BY :- ER. PRAVIN KR SINHA REG. NO. - RQP/BIH/SR.NO.20 LETTER NO.3825 DATED 07/11/2019
SIGNATURE

KIUL RIVER BLOCK NO.- 09 SAND GHAT

CO-ORDINATE	
A	25° 3'48.24"N 86° 9'8.22"E
B	25° 3'30.13"N 86° 9'12.62"E
C	25° 3'33.26"N 86° 9'4.89"E
D	25° 3'39.76"N 86° 8'59.42"E
E	25° 3'46.63"N 86° 8'59.32"E

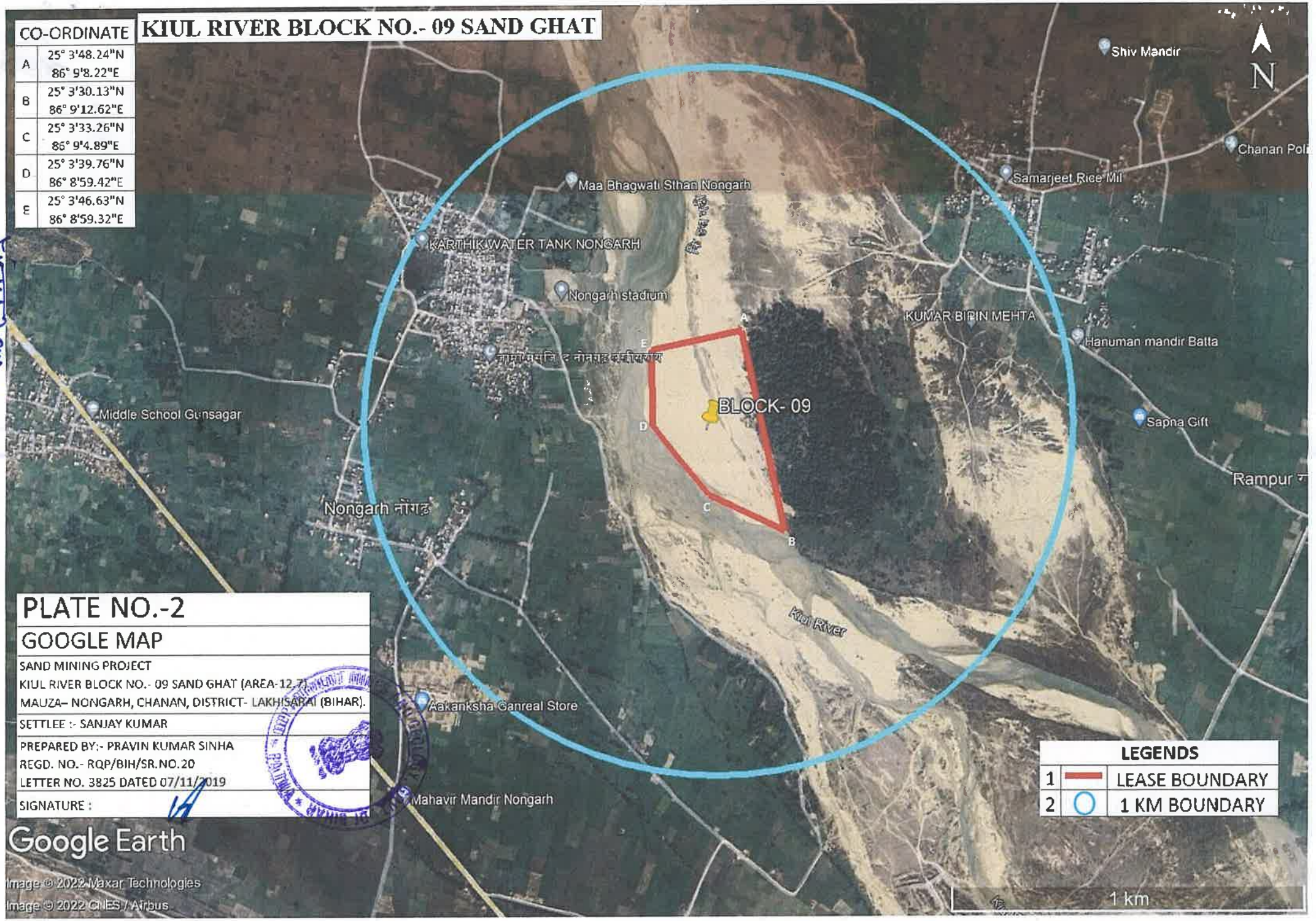


PLATE NO.-2

GOOGLE MAP

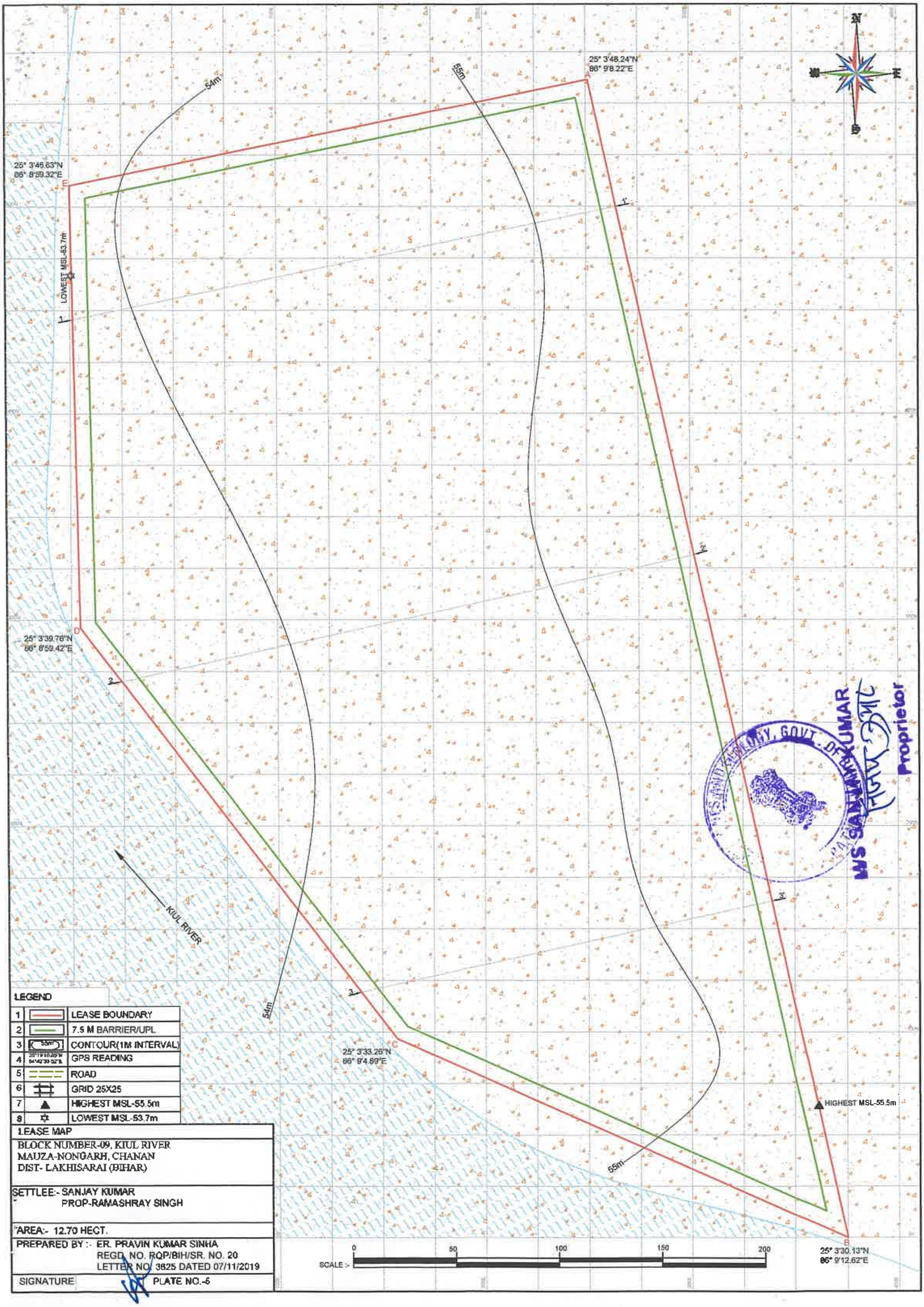
SAND MINING PROJECT
KIUL RIVER BLOCK NO.- 09 SAND GHAT (AREA-12.7)
MAUZA– NONGARH, CHANAN, DISTRICT- LAKHISARAI (BIHAR).

SETTLEE :- SANJAY KUMAR

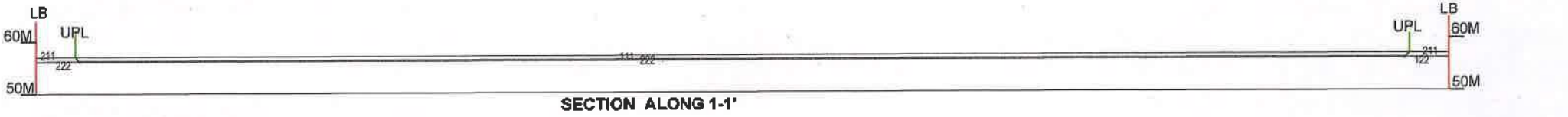
PREPARED BY:- PRAVIN KUMAR SINHA
REGD. NO.- RQP/BIH/SR.NO.20
LETTER NO. 3825 DATED 07/11/2019

SIGNATURE :

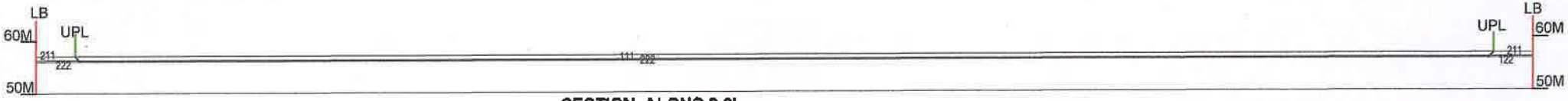
LEGENDS		
1		LEASE BOUNDARY
2		1 KM BOUNDARY



25° 3'48.24"N
86° 9'8.22"E
A
25° 3'46.63"N
86° 8'59.32"E
E
LOWEST MSL-53.7m
25° 3'39.76"N
86° 8'59.42"E
D
25° 3'33.26"N
86° 9'4.89"E
C
25° 3'30.13"N
86° 9'12.62"E
B
HIGHEST MSL-55.5m
54m
55m
KIUL RIVER
LEGEND
1 LEASE BOUNDARY
2 7.5 M BARRIER/UPL
3 CONTOUR(1M INTERVAL)
4 GPS READING
5 ROAD
6 GRID 25X25
7 HIGHEST MSL-55.5m
8 LOWEST MSL-53.7m
LEASE MAP
BLOCK NUMBER-09, KIUL RIVER
MAUZA-NONGARH, CHANAN
DIST- LAKHISARAI (BIHAR)
SETTLEE:- SANJAY KUMAR
PROP-RAMASHRAY SINGH
AREA:- 12.70 HECT.
PREPARED BY :- ER. PRAVIN KUMAR SINHA
REGD. NO. RQP/BIH/SR. NO. 20
LETTER NO. 3825 DATED 07/11/2019
SIGNATURE
PLATE NO.-6
SCALE :-
0
50
100
150
200
M/S SANJAY KUMAR
Proprietor



SECTION ALONG 1-1'



SECTION ALONG 2-2'

SECTION ALONG 1-1'

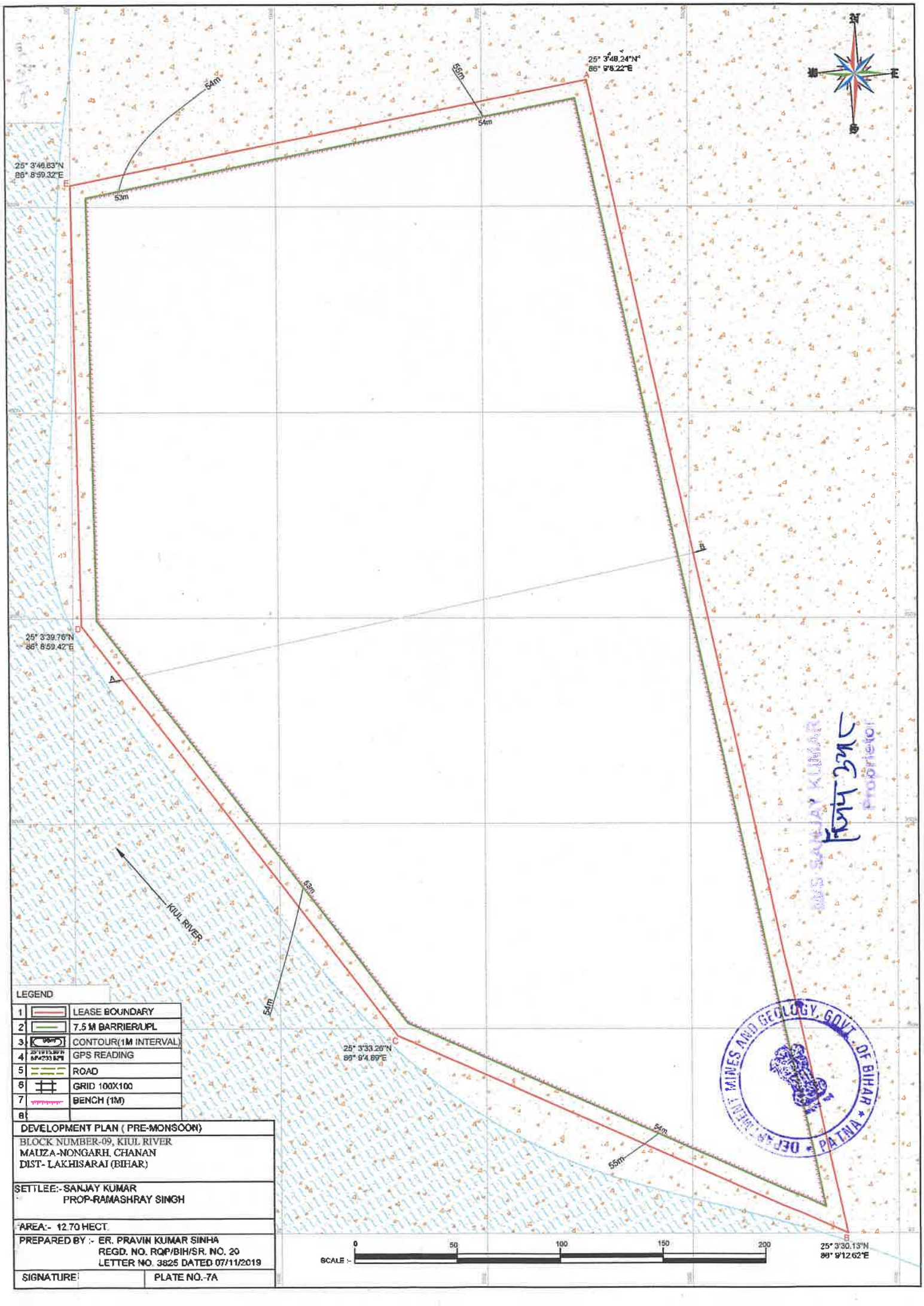
SECTION ALONG A-B

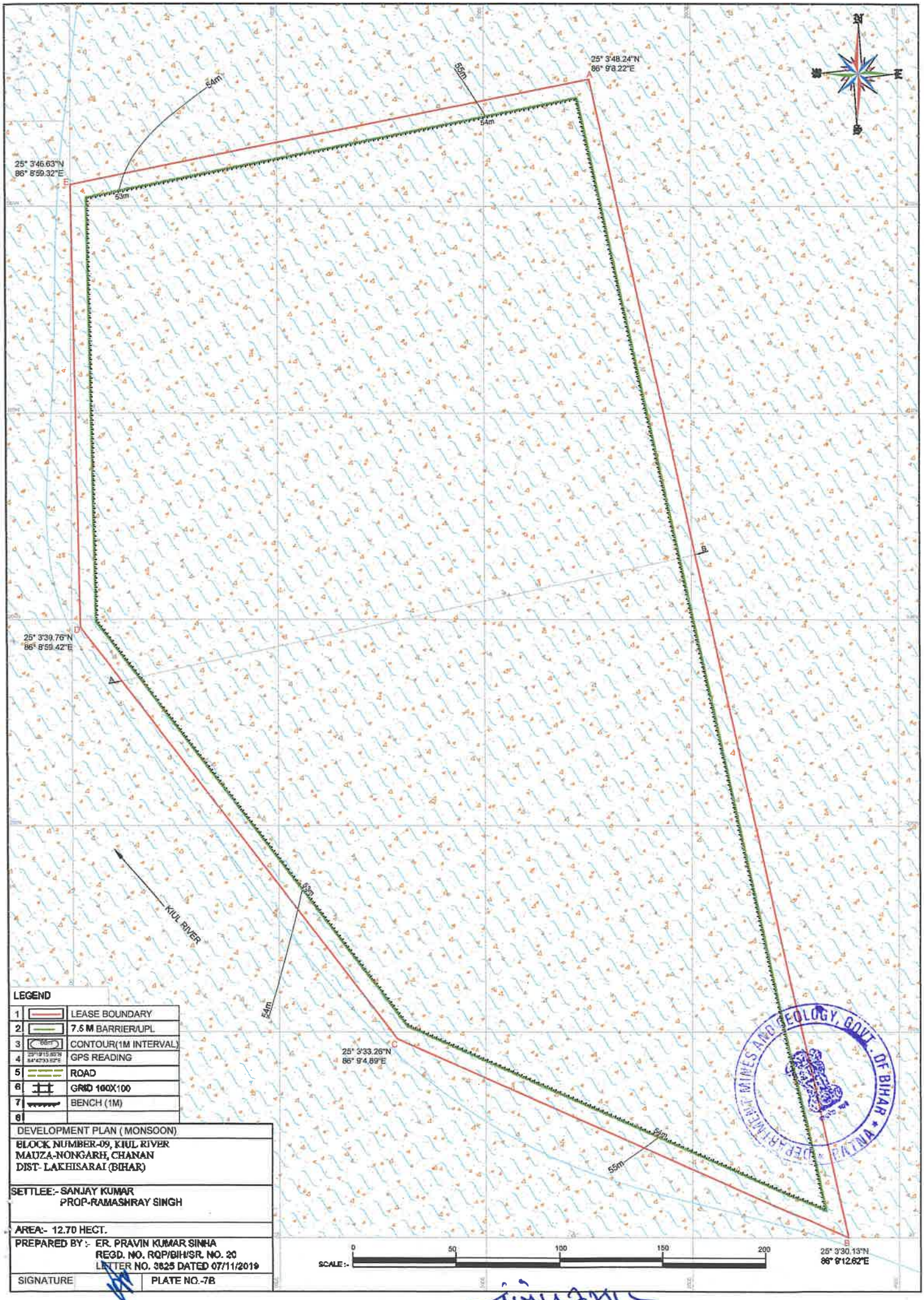
1		LEASE BOUNDARY(LB)
2		7.5 M BARRIER/UPL
3	LR	ROAD
4	111	PROVED RESERVE(111)
5	122	PROBABEE RESERVE(122)
6	211	FEASIBILITY RESOURCE (211)
7	222	PRE FEASIBILITY RESOURCE (222)

M/S SANJAY KUMAR

Proprietor

GEOLOGICAL/PIT SECTION	
BLOCK NUMBER-09, KIUL RIVER MAUZA-NONGARH, CHANAN DIST- LAKHISARAI (BIHAR)	
APPLICANT:-	SANJAY KUMAR PROP-RAMASHRAY SINGH
AREA:-12.70 HECT.	
PREPARED BY :-	PRAVIN KUMAR SINHA REGD. NO. RQP/JBP/129/2011/A
SIGNATURE	PLATE NO.-6


25° 3'48.24"N
86° 9'5.22"E
54m
55m
54m
53m
25° 3'46.83"N
86° 8'59.32"E
B
D
A
25° 3'39.76"N
86° 8'59.42"E
KIUL RIVER
53m
54m
C
25° 3'33.26"N
86° 9'4.89"E
54m
55m
B
25° 3'30.13"N
86° 9'12.62"E
SCALE :-
0
50
100
150
200
LEGEND
1 LEASE BOUNDARY
2 7.5 M BARRIER/UPL
3 CONTOUR(1M INTERVAL)
4 GPS READING
5 ROAD
6 GRID 100X100
7 BENCH (1M)
8
DEVELOPMENT PLAN (PRE-MONSOON)
BLOCK NUMBER-09, KIUL RIVER
MAUZA-NONGARH, CHANAN
DIST- LAKHISARAI (BIHAR)
SETTLEE:- SANJAY KUMAR
PROP-RAMASHRAY SINGH
AREA:- 12.70 HECT.
PREPARED BY :- ER. PRAVIN KUMAR SINHA
REGD. NO. RQP/BIH/SR. NO. 20
LETTER NO. 3825 DATED 07/11/2019
SIGNATURE
PLATE NO.-7A
M/S SANJAY KUMAR
Proprietor
DEPT. OF MINES AND GEOLOGY, GOVT. OF BIHAR * PATNA *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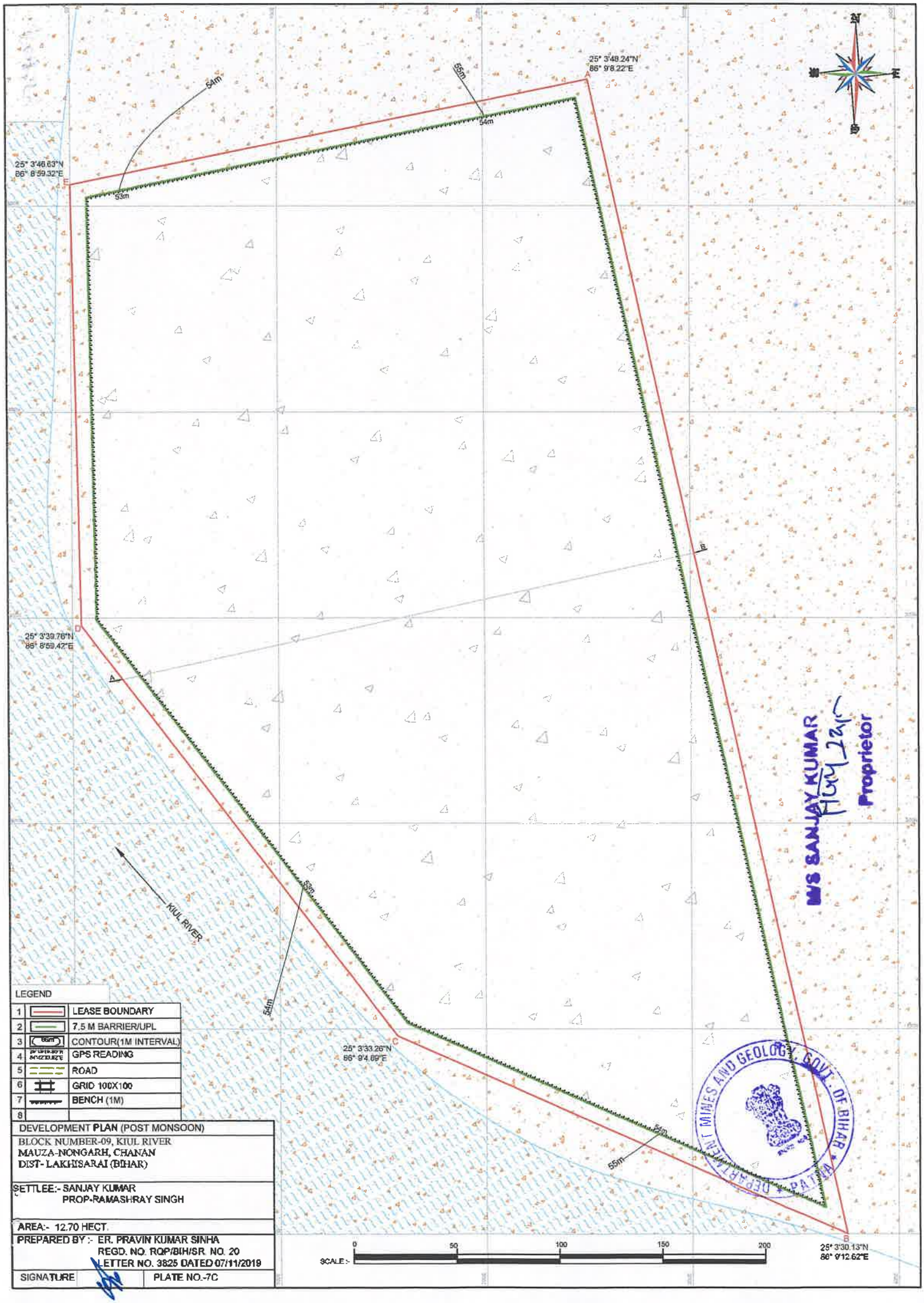
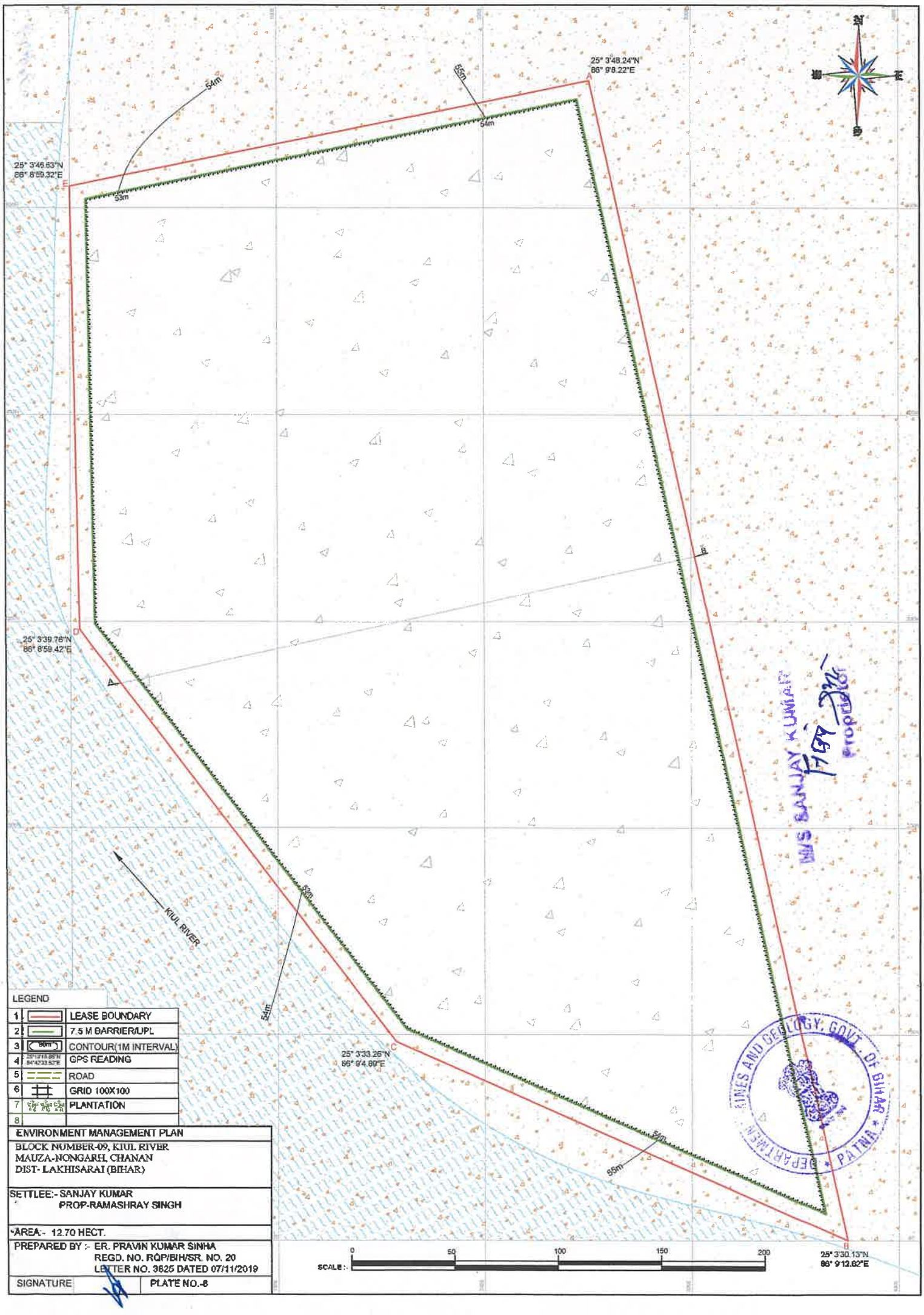
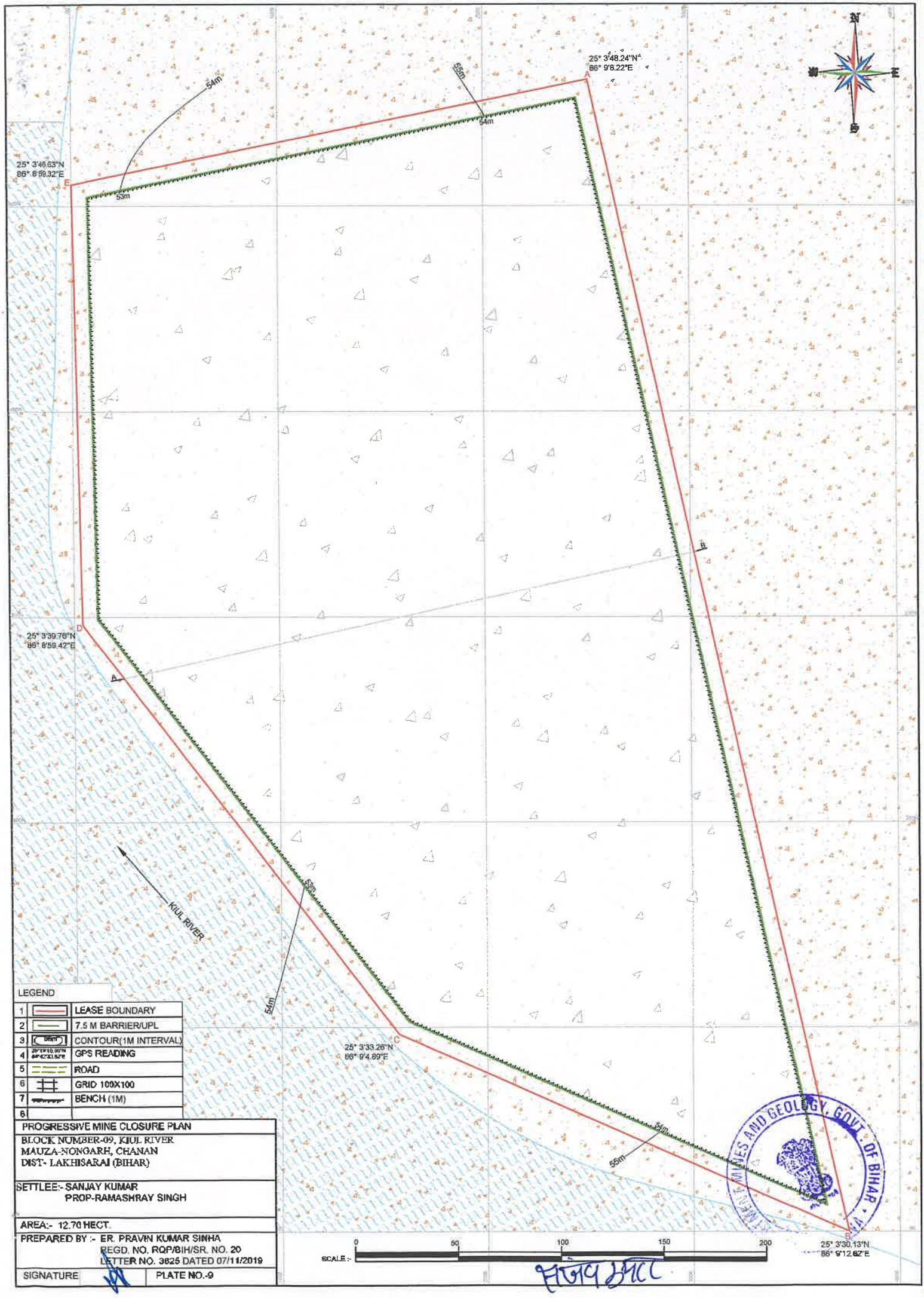
86° 9'8.22"E
25° 3'46.63"N
86° 8'59.32"E
25° 3'39.76"N
86° 8'59.42"E
25° 3'33.26"N
86° 9'4.89"E
25° 3'30.13"N
86° 9'12.62"E
54m
55m
53m
KIUL RIVER
LEGEND
1 LEASE BOUNDARY
2 7.5 M BARRIER/UPL
3 CONTOUR(1M INTERVAL)
4 GPS READING
5 ROAD
6 GRID 100X100
7 BENCH (1M)
8
DEVELOPMENT PLAN (MONSOON)
BLOCK NUMBER-09, KIUL RIVER
MAUZA-NONGARH, CHANAN
DIST- LAKHISARAI (BIHAR)
SETTLEE:- SANJAY KUMAR
PROP-RAMASHRAY SINGH
AREA:- 12.70 HECT.
PREPARED BY :- ER. PRAVIN KUMAR SINHA
REGD. NO. RQP/BIH/SR. NO. 20
LETTER NO. 3625 DATED 07/11/2019
SIGNATURE
PLATE NO.-7B
SCALE:- 0 50 100 150 200
DEPARTMENT OF MINES AND GEOLOGY, GOVT. OF BIHAR * PATNA *


25° 3'48.24"N
86° 9'8.22"E
25° 3'46.83"N
86° 8'59.32"E
25° 3'39.76"N
86° 8'59.42"E
25° 3'33.26"N
86° 9'4.69"E
25° 3'30.13"N
86° 9'12.62"E
54m
55m
93m
53m
KIUL RIVER
N
E
S
W
MS SANJAY KUMAR
Proprietor
DEPARTMENT OF MINES AND GEOLOGY GOVT. OF BIHAR PATNA
LEGEND
1 LEASE BOUNDARY
2 7.5 M BARRIER/UPL
3 CONTOUR(1M INTERVAL)
4 GPS READING
5 ROAD
6 GRID 100X100
7 BENCH (1M)
8
DEVELOPMENT PLAN (POST MONSOON)
BLOCK NUMBER-09, KIUL RIVER
MAUZA-NONGARH, CHANAN
DIST- LAKHISARAI (BIHAR)
SETTLEE:- SANJAY KUMAR
PROP-RAMASHRAY SINGH
AREA:- 12.70 HECT.
PREPARED BY :- ER. PRAVIN KUMAR SINHA
REGD. NO. ROP/BIH/SR. NO. 20
LETTER NO. 3825 DATED 07/11/2019
SIGNATURE
PLATE NO.-7C
SCALE:- 0 50 100 150 200


25° 3'48.24"N
86° 9'8.22"E
25° 3'46.53"N
86° 8'59.32"E
25° 3'39.76"N
86° 8'59.42"E
25° 3'33.26"N
86° 9'4.89"E
25° 3'30.13"N
86° 9'12.62"E
54m
55m
53m
KIUL RIVER
N
E
S
W
M/S SANJAY KUMAR
PROPRIETOR
MINES AND GEOLOGY, GOVT. OF BIHAR
DEPARTMENT
PATNA
LEGEND
1 LEASE BOUNDARY
2 7.5 M BARRIER/UPL
3 CONTOUR(1M INTERVAL)
4 GPS READING
5 ROAD
6 GRID 100X100
7 PLANTATION
8
ENVIRONMENT MANAGEMENT PLAN
BLOCK NUMBER-09, KIUL RIVER
MAUZA-NONGARH, CHANAN
DIST- LAKHISARAI (BIHAR)
SETTLEE:- SANJAY KUMAR
PROP-RAMASHRAY SINGH
AREA:- 12.70 HECT.
PREPARED BY :- ER. PRAVIN KUMAR SINHA
REGD. NO. RQP/BIH/SR. NO. 20
LETTER NO. 3625 DATED 07/11/2019
SIGNATURE
PLATE NO.-8
SCALE :- 0 50 100 150 200



LEGEND

1		LEASE BOUNDARY
2		7.5 M BARRIER/UPL
3	55m	CONTOUR(1M INTERVAL)
4		GPS READING
5		ROAD
6		GRID 100X100
7		BENCH (1M)
8		

PROGRESSIVE MINE CLOSURE PLAN

BLOCK NUMBER-09, KIUL RIVER
MAUZA-NONGARH, CHANAN
DIST- LAKHISARAI (BIHAR)

SETTLEE:- SANJAY KUMAR
PROP-RAMASHRAY SINGH

AREA:- 12.70 HECT.

PREPARED BY :- ER. PRAVIN KUMAR SINHA
REGD. NO. RQP/BIH/SR. NO. 20
LETTER NO. 3625 DATED 07/11/2019

SIGNATURE

PLATE NO.-9

DIRECTOR MINES AND GEOLOGY, GOVT. OF BIHAR

कार्यकारी सारांश

रेत खनन परियोजना
लखीसराय किउल नदी (ब्लॉक सं 09)
के लिए
ग्राम- नोनगढ़, चानन
जिला- लखीसराय, बिहार

रेत ब्लॉक	ब्लॉक सं 09
क्षेत्र	12.70 हेक्टेयर
उत्पादन	157734 टन प्रति वर्ष

आवदेन कर्ता

संजय कुमार
पुत्र रामाश्रय सिंह
पता:- न्यू कोर्ट एरिया नया बाजार,
लखीसराय, बिहार

एनवायरनमेंट कन्सल्टेंट

पी & एम सल्यूशन
(क्वालिटी कौंसिल ऑफ़ इंडिया द्वारा मान्यता प्राप्त)
सी-88 सेक्टर 65 नॉएडा उत्तर-प्रदेश
www.pmsolution.in
Accreditation No. : NABET/EIA/1992/IA0053

कार्यकारी सारांश

v 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।

v लखीसराय ब्लॉक संख्या - 09

परियोजना के प्रस्ताव संजय कुमार पुत्र रामाश्रय सिंह ने दिया है। प्रस्तावित रेत खनन परियोजना मौजा-नोनगढ़, चानन, जिला-लखीसराय (बिहार) में ब्लॉक संख्या - 09 रेत घाट पर किउल नदी पर स्थित है। पत्र संख्या 1557/एम दिनांक 08.12.2022 के माध्यम से पट्टेदार को एलओआई 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 14-02-2023 द्वारा जारी किया गया है।

आवेदित पट्टे के लिए प्रति वर्ष लगभग 157734 टन खनन प्रस्तावित किया गया है, प्रस्तावित परियोजना के लिए अनुमानित परियोजना लागत 12,31,63,000/- रुपये (नीलामी लागत सहित) है।

v **क्लस्टर स्थिति:** जिला सर्वेक्षण रिपोर्ट लखीसराय (पृष्ठ संख्या 53) के अनुसार ब्लॉक 7, ब्लॉक 8, ब्लॉक 9, ब्लॉक 10, ब्लॉक 11 और ब्लॉक 12 के प्रस्तावित रेत घाट क्लस्टर स्थिति में आते हैं जिनका संयुक्त क्लस्टर क्षेत्र 141.8 हेक्टेयर है। सजातीय खनिजों का समस्त पट्टा क्षेत्र एक दूसरे से 500 मीटर के दायरे में आ रहा है जो एक समूह स्थिति की पुष्टि करता है।

क्लस्टर का विवरण नीचे दिया गया है:

ब्लॉक का नाम	क्षेत्र (हे),	खाता	खसरा	उत्पादन (टीपीए)	पता
ब्लॉक-7	24.6	89			एकलव्य स्टोन एंड माइन्स प्रा. लिमिटेड निदेशक - निधि कुमारी

			01, 15, 366	305532	पत्नी - एकलव्य कुमार या कुमारी प्रीति पत्नी - श्री अखिलेश कुमार, ग्राम-पाथरा अंग्रेज, पोस्ट-ओरहानपुर, पी.एस. मुफस्सिल, जिला-नवादा (बिहार)।
ब्लॉक-8	33.2	--	--	412344	--
ब्लॉक-9	12.7	295	555	157734	संजय कुमार पुत्र रामाश्रय सिंह Add.- न्यू कोर्ट एरिया नया बाजार, लखीसराय
ब्लॉक-10	39.3	295, 296	555, 2316	488106	अमित सिंह पुत्र- स्वर्गीय निवास सिंह ग्राम – पहाड़पुर, पोस्ट – दरियापुर, पीएस - बरहिया, जिला - लखीसराय (बिहार)
ब्लॉक-11	12.7	65, 188	01, 555, 1226	228528	गोपाल कुमार, पुत्र - केदार प्रसाद शर्मा पता : वलीपुर, पिपरिया, लखीसराय (बिहार)।
ब्लॉक-12	13.6			168912	
कुल	**141.8**			1761156 **(टीपीए)**	

v परियोजना विवरण

स्थिति:

1. लखीसराय रेत ब्लॉक 09 किऊल नदी परियोजना

प्रस्तावित खनन पट्टा क्षेत्र सर्वे ऑफ इंडिया टोपोशीट टोपो शीट संख्या- 72 K/4 एवं 72L/1 के अंतर्गत आता है। पट्टा क्षेत्र मौजा-नोनगढ़, चानन, जिला-लखीसराय, राज्य- बिहार में स्थित है। खान पट्टा समन्वय नीचे सूचीबद्ध हैं:

स्तंभ	अक्षांश (एन)	देशांतर (ई)
A	25° 3'48.24"N	86° 9'8.22"E
B	25° 3'30.13"N	86° 9'12.62"E
C	25° 3'33.26"N	86° 9'4.89"E
D	25° 3'39.76"N	86° 8'59.42"E
E	25° 3'46.63"N	86° 8'59.32"E

- **क्षेत्र और उत्पादन**: कुल क्षेत्रफल 12.7 हेक्टेयर है। उत्पादन की प्रस्तावित दर 157734 टीपीए होगी।

- **संयोजकता**

1. लखीसराय ब्लॉक 09 किऊल नदी परियोजना

लखीसराय ब्लॉक 09 रेत घाट पट्टे से 2.10 कि.मी. की दूरी पर निकटतम पक्की सड़क से अच्छी तरह से जुड़ा हुआ है। SH 18 लगभग 1.40 किमी पश्चिम दिशा की ओर है मननपुर रेलवे स्टेशन, लगभग 2.50 किमी उत्तर पूर्व दिशा की ओर है।

परियोजना की मुख्य विशेषताएं

1. लखीसराय ब्लॉक 09 किऊल नदी परियोजना

आवेदक का नाम	संजय कुमार पुत्र रामाश्रय सिंह
पट्टेदार का पता	संजय कुमार पुत्र रामाश्रय सिंह पता:- न्यू कोर्ट एरिया नया बाजार, लखीसराय, बिहार

नाम	लखीसराय ब्लॉक नंबर- **09** रेत घाट, मौजा-नोनगढ़, चानन, जिला-लखीसराय (बिहार) में किऊल नदी पर रेत खनन परियोजना
गाँव	मौजा - नोनगढ़, चानन
जिला और राज्य	लखीसराय, बिहार
टोपोशीट नंबर	72 K/4 & 72 L/1
खनिज	रेत
क्षेत्र (हेक्टेयर)	12.7 हेक्टेयर

- **ड्रिलिंग**

ड्रिलिंग और ब्लास्टिंग की आवश्यकता नहीं हैA

- **खनिज का उपयोग**

रेत का उपयोग निर्माण कार्यवो 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। रेत 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। टनभार प्राप्त करने के लिए वॉल्यूम को बल्क डेंसिटी (2.07 g/cm3) से गुणा किया जाता 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 रेत का वार्षिक दोहन नीचे दिया गया है:

ब्लॉक नं: 09

बेंच स्तर (mRL)	लंबाई (M)	चौड़ाई (M)	गहराई (M)	मात्रा (घन मीटर)	टन
55-54	494	235	1	116090	240307
Total				116090	240307

कुल खनन योग्य रिजर्व = 116090 घन मीटर या 240307 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 रेत से भर जाएगा (रिप्लेनिशमेंट) और क्षेत्र अपनी मूल स्थलाकृति बहाल को कर देगा।

v **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 13.50 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 दिसंबर 2022 से जनवरी-फरवरी 2023 तक सर्दियों के मौसम के दौरान खनन पट्टा क्षेत्र के आसपास 10 किमी की रेडियल दूरी वाले क्षेत्र में किया गया था।

· **अंतरिक्ष-विज्ञान**

निगरानी अवधि दिसंबर 2022 से जनवरी-फरवरी 2023 के लिए संक्षिप्त मौसम संबंधी डेटा नीचे दिया गया है:

महीना	**तापमान °C**		**हवा की गति (किमी/घंटा)**	
	न्यूनतम	**अधिकतम**	**न्यूनतम**	**अधिकतम**
दिसम्बर 2022	12	24	1	25
जनवरी 2023	06	18	1	28
फरवरी 2023	14	25	2	30

आधारभूत पर्यावरणीय स्थिति

गुण	**आधारभूत स्थिति**
एम्बिएंट(परिवेशी) वायु गुणवत्ता	एम्बिएंट (परिवेशी) वायु गुणवत्ता निगरानी से पता चलता है कि सभी 14 AQ निगरानी स्टेशनों में PM2.5 की न्यूनतम और अधिकतम सांद्रता क्रमशः 24.5 µg/m3 से 51.5 µg/m3 पाई गई; PM10 51.4 µg/m3to 95.9µg/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 चार 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। किउल नदी के सतही जल विश्लेषण के परिणामों से यह स्पष्ट होता है कि नमूनों के अधिकांश पैरामीटर सीपीसीबी के 'श्रेणी बी' मानकों का अनुपालन करते हैं, जो इंगित करता है यह जल स्नान के लिए उपयुक्त 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 6.44 से 8.12 के बीच है, जो दर्शाता है कि मिट्टी प्रकृति में थोड़ी क्षारीय है।
पारिस्थितिकी और जैव विविधता	भीमबंद वन्यजीव अभ्यारण्य अध्ययन क्षेत्र के 10 किमी में मौजूद है
सामाजिक आर्थिक	नदी तल पर रेत 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।

v 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 रेत 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 किऊल 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।

v 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।

रेत 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 (रिप्लेनिशमेंट)।

v 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।

v 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।

v सामाजिक आर्थिक पर्यावरण पर प्रभाव

क्षेत्र में खनन गतिविधि का प्रभाव क्षेत्र के सामाजिक-आर्थिक वातावरण पर सकारात्मक है। रेत 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

v अतिरिक्त अध्ययन

- **सार्वजनिक सुनवाई**

जन सुनवाई अभी बाकी है।

v 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।

v 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।

v 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।

v पर्यावरणीय लाभ:

- v नदी चैनल को नियंत्रित करना और बैंकों की सुरक्षा करना।
- v बाढ़ के कारण आसपास की कृषि भूमि के डूबने को कम करना।
- v नदी के स्तर के उन्नयन को कम करना।
- v अवैध खनन गतिविधि पर एक जांच।

v 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।

सैंड ब्लॉक 09 के लिए सीईआर (CER) लागत कुल परियोजना लागत का 2% होगी। इस राशि का उपयोग समाज कल्याण के लिए किया जाएगा। सीएसआर (CSR) लागत 12,31,63,000/-x 2% = रु. 24,63,260/- 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।

पर्यावरण प्रबंधन योजना (ईएमपी)

- Ø रिवर बैंक से सुरक्षा क्षेत्र छोड़कर नदी तल से निकासी की जाएगी।
- Ø अधिकतम काम करने की गहराई क्षेत्र के भूजल तालिका के ऊपर रहेगी।
- Ø स्वास्थ्य प्रभावों को कम करने के लिए प्रभाव क्षेत्र में श्रमिकों और आसपास के लोगों को स्वास्थ्य सुविधाएं प्रदान किया जायेगा ।
- Ø वन्यजीव संरक्षण सुनिश्चित करना और उसी के लिए जागरूकता अभियान की व्यवस्था किया जायेगा।
- Ø नदी में महीन तलछट छोड़ने वाली गतिविधियों को किया जायेगा।
- Ø खनिजों के परिवहन और प्रबंधन के दौरान गड़बड़ी को कम करने के लिए प्रभावी शमन उपाय अपनाए जाएंगे

Ø स्थानीय/देशी और तेजी से बढ़ने वाली प्रजातियों के वृक्षारोपण के साथ सुधार कार्यक्रम की स्थापना किया जायेगा

Ø मानसून के मौसम की शुरुआत में खान के बंद होने के दौरान बहाली योजना की स्थापना किया जायेगा

Ø आसन्न आपदाओं के प्रभाव से बचने के लिए समय पर एहतियाती उपाय करने के लिए प्रभावी आपदा प्रबंधन योजना की स्थापना।

Ø पर्यावरण प्रबंधन प्रकोष्ठ द्वारा प्रभावी निगरानी कार्यक्रम की स्थापना किया जायेगा।

v 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।
- लगभग। योजना अवधि में हॉल रोड के आसपास 127 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।

v ईएमपी कार्यान्वयन के लिए बजट आवंटन

टेबल, ईएमपी का बजट (ब्लॉक -09)

क्रम संख्या	विवरण	पूंजी लागत (लाख)	आवर्ती लागत (लाख)
1	प्रदूषण नियंत्रण और धूल दमन	**Nil**	**2.0**

2	प्रदूषण निगरानी i) वायु प्रदूषण ii) मृदा प्रदूषण iii) जल प्रदूषण iv) ध्वनि प्रदूषण	--	2.0
3	एक माली के लिए वृक्षारोपण और वेतन (अंशकालिक आधार पर)	1.27	0.5
4	परिवहन सड़क रखरखाव लागत	5.25	0.5
TOTAL		**6.52**	**5.0**

नोट: *127 पौधे * 1000 रुपये (हेज और बाड़ सहित प्रत्येक पौधे के लिए) = 127000/- रुपये

· ढोना 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*2.1 किमी लंबी सड़क) = 5,25,000/-

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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EXECUTIVE SUMMARY

FOR

SAND MINING PROJECT BLOCK NO- 09 LAKHISARAI SAND GHAT ON KIUL RIVER

At
Mauza- Nongarh, Chanan, District- Lakhisarai ,
State – Bihar

SAND BLOCK	BLOCK 9
AREA	12.7 HA
PRODUCTION	76200 cum/year or 157734 TPA

PROJECT PROPONENT

Sanjay Kumar
S/o Ramashray Singh
Add.- New Court Area Naya Bazar, Lakhisarai.

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.

Lakhisarai Block No – 09

The project has been proposed by Sanjay Kumar S/o Ramashray Singh. The Proposed Sand Mining Project was located on Kiul River at Block No – 09 Sand Ghat at Mauza- Nongarh, Chanan, Dist-Lakhisarai (Bihar). LOI issued to lessee via letter no 1557 /M, Lakhisarai dated 08-12-2022.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 14-02-2023.

Cluster Situation: As per District Survey Report Lakhisarai (Page no 53) the Proposed sand Ghats of block 7, block 8, block 9, block 10, block 11 & block 12 are comes in cluster situation whose combined cluster area is 141.8 ha. All the lease area of homogeneous minerals is coming within 500 m radius from each other confirming a cluster situation.

It has been proposed to mine around 157734 TPA for applied lease. The estimated project cost for the proposed project is **Rs 12,31,63,000/-** (including auction cost)

PROJECT DESCRIPTION

LOCATION

1. Lakhisarai Block 09 Kiul River

The proposed mining lease area falls in Survey of India Toposheet Topo sheet No- 72 K/4 & 72L/1. The lease area is located in Mauza- Nongarh, Chanan, Dist-Lakhisarai, State- Bihar. The mine lease co-ordinates are listed below:

Pillar No	Latitude (N)	Longitude (E)
A	25° 3'48.24"N	86° 9'8.22"E
B	25° 3'30.13"N	86° 9'12.62"E
C	25° 3'33.26"N	86° 9'4.89"E
D	25° 3'39.76"N	86° 8'59.42"E
E	25° 3'46.63"N	86° 8'59.32"E

Area & production: The total ML area is 12.7 Ha. Proposed rate of production will be 157734 TPA.

Connectivity:

1. Lakhisarai Block 09 Kiul River

Lakhisarai Block 09 Sand Ghat is well connected to the nearest metalled road 2.1Km distance from the lease. SH-18 is approx. 1.40Km away in SW direction., Mananpur Railway station at distance of approx. 2.50 Km in NE direction

Salient Features of Project

1. Lakhisarai Block 09 Kiul River

Name of the applicant	Sanjay Kumar S/o Ramashray Singh
Address of Lessee	Sanjay Kumar S/o Ramashray Singh Add.- New Court Area Naya Bazar, Lakhisarai Bihar
Name of Mine	Sand Mining Project on Kiul River at Lakhisarai Block No.- 09 Sand Ghat, Mauza– Nongarh, Chanan, Dist-Lakhisarai (Bihar)
Village	Mauza – Nongarh, Chanan
District & State	Lakhisarai, Bihar
Mineral	Sand
Area (ha)	12.7 hectare

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 1 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 1m depth from surface. Benches having height 1.0m & width 6.0m drawn from the ultimate pit limit. Area of each benches have been calculated multiplied by strike influence to get the volume. The volume multiplied by bulk density (2.07) to get the tonnage.

The minerals excavated from the river bed will be replenished gradually during the monsoon season every year. And the area pertaining to palaeo channels of the river will be leveled & restored back.

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

Block No.- 09

Bench Level (mRL)	Length (m)	Width (m)	Depth (m)	Volume (cum)	Tonnes
55-54	494	235	1	116090	240307
Total				116090	240307

Total Mineable Reserve = 116090 CUM or 240307 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 13.50 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 winter season from Dec 2022 to Jan-Feb 2023

Meteorology

The Summarized Meteorological Data for the Monitoring Period Dec 2022 to Jan-Feb 2023) is given below:

Month	Temperature °C		Wind Speed (Km/Hr)	
	Min	Max	Min	Max
DEC 2022	12	24	1	25
JANUARY 2023	06	18	1	28
FEBRUARY 2023	14	25	2	30

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 14 AQ monitoring stations were found to be 24.5 µg/m^3 to 51.5 µg/m^3 respectively; PM10 was in the range of 51.4 µg/$m^3$to 95.9µg/m^3 As far as the gaseous pollutants SO_2 and NO_2 are concerned, the prescribed CPCB limit of 80 µg/m^3 for residential and rural areas has never been surpassed at any station.
Noise Levels	The results of the monitoring program indicated that both the daytime and night time levels of noise were well within the prescribed limits of NAAQS, at all the four locations monitored.
Water Quality	The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards promulgated by IS: 10500. Surface water analysis from River Kiul results it is evident that most of the parameters of the samples comply with 'Category B'

	standards of CPCB, indicating their suitability for outdoor bathing.
Soil Quality	Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from 6.44 to 8.12, which shows that the soil is slightly alkaline in nature.
Ecology and Biodiversity	Bhimbandh Wild Life sanctuary & Bhimbandh protected forest within 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 Kiul 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:

- Ø Controlling *river* channel and protection of banks.
- Ø Reducing submergence of adjoining agricultural lands due to flooding.
- Ø Reducing aggradation of *river* level.
- Ø 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.

CSR cost will be 2% of the total project cost. This amount will be used for social welfare. CSR COST is 12,31,63,000 x 2% = Rs. 24,63,260/-.

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.

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.

v **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 theseplantations. Trees of economic importance and native origin such as fruit treesshall be planted.
- Approx. 127 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,minimum5 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.

BUDGET ALLOCATION FOR EMP IMPLEMENTATION

Table, Budget of EMP (Block-09)

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	**Nil**	**2.0**
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).	1.27	0.5
4	Haul road Maintenance Cost	5.25	0.5
TOTAL		**6.52**	**5.0**

Note: *127plants * 1000 Rs (for each plants including hedges and fences) =Rs127000/-

- 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 *2.1 km haul road) = 5,25,000/-

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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