Haryana State Pollution Control Board
C-11, Sector-6, Panchkula
Website – www.hspcb.gov.in **E-Mail** - hspcb.ho@gmail.com
HSPCB **Tele No. – 0172-2577870-73**

HSPCB/SWM/2023/ **dated**

To

The Director General,
Information, Public Relations
& Cultural Affairs Department,
Haryana, Chandigarh.

Sub: Public hearing for Mining of sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ Year Production over an area of 33.42 Ha located at village – Sultanpur & Atwa, Tehsil & District Palwal and State Haryana – Regarding Submission of Draft EIA (Environment Impact Assessment) Report of Conducting Public Hearing as per provision of EIA Notification 2006 (amended thereof).

I have been directed to enclose herewith an advertisement regarding Public Hearing notice to be held on **28.03.2023 at 11:30 AM** in respect to Environment Clearance and conducting of Public Hearing of Project for Mining of sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ Year production over an area of 33.42 Ha located at village – Sultanpur & Atwa, Tehsil & District Palwal and State Haryana – Regarding Submission of Draft EIA (Environment Impact Assessment) Report of Conducting Public Hearing as per provision of EIA Notification 2006 (amended thereof) for publication in the following leading newspapers on DAVP rates:-

1. One major national daily newspaper
2. One Regional Vernacular daily newspaper in Hind.

The advertisement should appear on or before **20.02.2023** in the above said two newspapers only and bill of above two newspapers on DAVP rates may be sent to this office at the earliest. The bill payment of above said notice will be made for two newspapers only.

DA/Advertisement

Sr. Env Engineer (HQ)
For Member Secretary

CC:

A copy of the above is forwarded to the following for information and necessary action:-

1. Deputy Commissioner, Palwal.
2. The Chairman, Zila Parishad, District, Palwal.
3. Municipal Council / Corporation District, Palwal for display on Notice Board.
4. District Development and Panchayat Officer, Palwal
5. Deputy Director, District Industries Centre, Palwal.

DA/Advertisement.

Sr. Env. Engineer (HQ)
For Member Secretary

CC: HSPCB/I/153743/7 Dated 17/02/2023

A copy of the above is forwarded to the following alongwith copy of EIA report and Executive Summary and CD for sending the same to the concerned authorities mentioned above to place the same in their offices for consultation of the general public during office hours:-

1. Regional Officer, Haryana State Pollution Control Board, II-Floor, HSVP Office Complex, Near Gymkhana Club, Sector-12, Palwal-121102.
2. M/s M.M Traders Village Mangola Near Manjeet Filling Station, Meerut Road Karnal, Haryana
3. Sr. EE (IT) to ensure that the notice is uploaded on the website of the Board.

DA/Advertisement.

17/2/2023

Sr. Env. Engineer (HQ)
For Member Secretary

CC

A copy of the above is forwarded to the following for information please:-

1. The Additional Chief Secretary to Govt. Haryana, Environment & Climate Change Department, Haryana Chandigarh
2. The Director General, Environment & Climate Change Department, Haryana.
3. PS to Chairman / PA to Member Secretary.

DA/Advertisement

Sr. Env. Engineer (HQ)
For Member Secretary

HARYANA STATE POLLUTION CONTROL BOARD
C-11, SECTOR-6, PANCHKULA
Website – www.hspcb.gov.in E-Mail - hspcbho@gmail.com
Tele Fax No. – 0172-2577870-73

Notice For Public Hearing

It is for the information of all concerned regarding conducting the Public Hearing of proposed project Mining of sand (Minor Meneral) from the River bed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/year production over an area of 33.42 Hectare located at Village-Sultanpur & Atwa, Tehsil & District Palwal. This project is covered under the ambit of Environment Impact Assessment Notification dated 14 th Sep, 2006 issued by the Ministry of Environment, Forest and Climate Change Department, GOI, thus required to obtain Environmental Clearance. The detail of unit/project and date, time & venue of Public Hearing is given as under:-

Sr. No.	Name of the Unit	Date of Public Hearing	Time of Public Hearing	Venue of Public Hearing
1.	M/s M.M Traders Village Mangola Near Manjeet Filling Station, Meerut Road Karnal, Haryana.	**28.03.2023**	**11.30 A.M**	Near the Mining site of Village Sultanpur & Atwa, Tehsil and District Palwal Haryana.

As a part of procedure for seeking the Environmental clearance, notified by the Ministry of Environment, Forest & Climate Change Department, Govt. of India, New Delhi vide Notification No. S.O. 1533 (E), dated 14.9.2006, the project proponent mentioned above have applied to the Haryana State Pollution Control Board, **for conducting a Public Hearing so as to obtain views, suggestions and objection, if any, of the nearby Public on the proposed project. Copies of executive summary of the project and EIA study report, submitted by the project proponent, are available in the following offices, which can be perused during office hours,** on any working day : -

1. Deputy Commissioner, Palwal.
2. Regional Officer, Haryana State Pollution Control Board, II-Floor, HSVP Office Complex, Near Gymkhana Club, Sector-12, Palwal-121102.
3. O/o Chairman Zila Parishad, Palwal.
4. O/o Commissioner, Municipal Council, Palwal.
5. District Development and Panchyat Officer, Palwal.
6. Deputy Director, District Industries Centre, Palwal.

Notice is hereby given to all concerned, to file suggestions, views, comments and objections, if any, on the proposed project, to the Chairman, Haryana State Pollution Control Board, C-11, Sector -6, Panchkula as well as Regional Officer, Haryana State Pollution Control Board, II-Floor, HSVP Office Complex, Near Gymkhana Club, Sector-12, Palwal-121102 within 30 days, Besides, Public Hearing also will be held on the date, time & Venue mentioned above **at the proposed site** of the project, which can be attended by any person including bonafide residents, Environmental group and other located at the project site / sites of displacement / sites likely to be affected. Oral/Written suggestion, if any be admissible for attending the Public Hearing.

No TA/DA will be admissible for attending the Public Hearing.

Pardeep Kumar, IAS
Member Secretary

KEEP HARYANA CLEAN AND POLLUTION FREE

GSTIN-06ABFFM5822N1ZY

2610816/2023/Estt.Br

(M) 90506-66710
(M) 92670-40000

M.M. TRADERS

Village Manglora, Near Manjeet Filling Station, Meerut Road,
KARNAL, Haryana -132001

Ref. No...... **Dated**.....

Ref. No.
Encl. As above

Date: 19.01.2023

The Member Secretary
Haryana State Pradesh Pollution Control Board,
C-11, Sector-6, Panchkula,
Haryana - 134109,

Sub.: Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ year production over an area of 33.42 ha located at Village Sultanpur &Atwa, Tehsil & District Palwal and State Haryana- Regarding Submission of Draft EIA (Environment Impact Assessment) Report for Conducting Public Hearing as per provision of EIA Notification 2006 (amended thereof)

Ref.: State Level Environment Impact Assessment Authority, Haryana- ToR Letter File No. SEIAA/HR/2022/264 dated 15.11.2022.

Sir,

With reference to above mentioned subject, M/s M. M. Traders has proposed Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ year production over an area of 33.42 ha located at Village Sultanpur &Atwa, Tehsil & District Palwal and State Haryana. M/s M. M. Tradershas appointed Parivesh Environmental Engineering Services, a NABET accredited consultant vide NABFT /EIA/2124/IA 0092(Rev.01), for conducting EIA study and obtaining Environmental Clearance as per EIA Notification, 2006 and its subsequent amendments.

As per EIA Notification 2006, our project requires Public Hearing, for this purpose we are submitting the following documents with demand draft of INR 1,50,000 vide DD No. 570787 dated 18.01.2023.

1) 1Hard copy of Draft EIA/EMP Report.
2) 1Hard copies of executive summary in Hindi and English.
3) 1Soft copies of above documents in CD.
4) Demand Draft (**DD No. 570787**) in name of Member Secretary, Haryana State Pollution Control Board, payable at Panchkula.

In view of the above, it is requested to please acknowledge the mentioned documents and process the project for Public Hearing on an early date.
Thanking You,

For M/s M. M. Traders

Vipin
(Authorized Signatory)
Encl. As above

2610816/2023/Estt.Br

भारतीय स्टेट बैंक
State Bank of India
जारीकर्ता शाखा / Issuing Branch: GRAIN MARKET (KARNAL)
कोड क्र /CODE No: 09123
Tel No. 184-2272651

A/C Payee

मांगड्राफ्ट
DEMAND DRAFT

Key: TUDCOY
Sr. No: 192951

1	8	0	1	2	0	2	3
D	D	M	M	Y	Y	Y	Y

मांगे जानेपर MEMBER SECRETARY HARYANA STATE POLLUTION CONTROL BOARD******
ON DEMAND PAY या उनके आदेश पर
OR ORDER

रुपये RUPEES One Lakh Fifty Thousand Only

अदा करें ₹ 150000.00

IOI 000456570787
Name of Applicant Key: TUDCOY Sr. No: 192951
M/S M.M. TRADERS

AMOUNT BELOW 150001(0/6)

मूल्य प्राप्त / VALUE RECEIVED

भारतीय स्टेट बैंक
STATE BANK OF INDIA
अदाकर्ता शाखा / DRAWEE BRANCH:PANCHKULA
कोड क्र. /CODE No: 01509

AUTHORISED SIGNATORY
BRANCH MANAGER

KRISHAN CHANDER
C-5160

कम्प्यूटर द्वारा मुद्रित होने पर ही वैध
VALID ONLY IF COMPUTER PRINTED

केवल 3 महीने के लिए वैध
VALID FOR 3 MONTHS ONLY

INSTRUMENTS FOR ₹ 1,00,000 & ABOVE ARE NOT VALID UNLESS SIGNED BY TWO OFFICERS

⑈570787⑈ 000002000⑆ 000456⑈ 16

2610816/2023/Estt.Br

DRAFT ENVIRONMENT IMPACT ASSESSMENT (EIA) REPORT

MINING OF SAND (MINOR MINERAL) FROM THE RIVERBED OF YAMUNA RIVER (SULTANPUR UNIT)

VILLAGE SULTANPUR & ATWA, TEHSIL & DISTRICT PALWAL AND STATE HARYANA.

MAXIMUM PRODUCTION – 10,80,000 MTPA

AREA – 33.42 HA

PROPONENT	:	**M/S M. M. TRADERS**
ENVIRONMENT CONSULTANT	:	**PARIVESH ENVIRONMENTAL ENGINEERING SERVICES** Nabet Certificate No. - NABET /EIA/2124/IA 0092 (Rev.01)
STUDY PERIOD	:	**POST-MONSOON (OCTOBER 2022 TO DECEMBER 2022)**
VERSION	:	**PEES/EIA/22-23/23**

JANUARY 2023

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF ANNEXURES

CHAPTER – 01

INTRODUCTION

1. Introduction

Environmental Impact Assessment (EIA) is a procedure used to examine the environmental consequences or impacts, both beneficial and adverse, of a proposed development and to ensure that these effects are considered in project design stage and suggest mitigation measures are proposed to minimize the adverse impacts caused to the project activity.

M/s M. M. Traders, through Manjeet Kumar S/o Shri Ved Parkash, Village Manglora Quidem, Karnal, Haryana was the highest bidder (4.56 Crores) for the Sand quarries of Sultanpur Unit for which auction held on 26-06-2022.

The applicant is involved in the Mining business for last many years. The applicant can invest necessary funds for the scientific and systematic development of mines including land rejuvenation and progressive reclamation programme and other measures necessary to protect the quality of the environment and human health etc.

1.1. Project Brief

The project is mining of sand over Riverbed of Yamuna River near village Sultanpur & Atwa, Tehsil & District Palwal in the State of Haryana. Yearly production capacity is 10,80,000 MT/year and spread of lease is 33.42 ha.

Based on Haryana Government Gazette notification dated 25-05-2022 issued by DMG, Haryana and the Khasra map submitted by the applicant, survey of the area was carried out along the course of the river Yamuna in the revenue villages of Sultanpur and Atwa which flow from North to South side. Workings will be restricted within the lease area/ khasra allotted. Mining activities will be carried out in a manner so that there is no obstruction to the movement of water flow, if any, during rainy season. The total length of the lease area is about 1.50 km.

Table 1–1: Approvals / Permissions from Concerned Authorities

NOCs	Approval / Permission Details	Annex. No.
Lease Grant	Letter of Intent has been issued by the Director Mines & Geology Haryana vide letter no. **DMG/HY/SULTANPUR UNIT/PALWAL/2022/5242 PANCHKULA dated 17-08-2022** for Mining of Sand (Minor Mineral) in Sultanpur Unit, comprising Sultanpur & Atwa villages over an area of 33.42 hectares in district Palwal, Haryana for a period of 8 years.	Annex 1.1
Cluster NOC	The information was asked about other mines coming within 500m radius from the lease from Department of Mines and Geology, Faridabad. The clarification from department vide letter **MO/FBD/6926 dated 29.08.2022** confirms there is no other mining activity within 500m from project lease boundary to form mining cluster. So, it is individual project in the area.	Annex 1.2
Mining Plan	As per rule 70 of Haryana Minor Mineral Concession, Stocking, Transportation of Minerals & Presentation of Illegal Mining Rule, 2012, the mining plan was submitted to department and mining plan was approved vide reference no. **DMG/HG/SULTANPUR UNIT/2022/6375-6378 DATED 18.10.2022**.	Annex 1.3
Forest NOC	Clarification for No forest involved in proposed lease for both pits have been obtained vide **Reference No. (SRN): QC6-9N2-V919 dated 28.09.2022** for Sultanpur unit & **Reference No. (SRN): XU8-D8R-RJVJ dated 28.09.2022** for Atwa unit.	Annex 1.4

Table 1–2: Salient Features of Mine

S. No.	Parameters	Description		
1.	Name of the project	Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit)		
2.	Nature & category of Mine	Non-Coal Mining Category 'B' of Activity 1(B)		
3.	Project Proponent	M/s M. M. Traders		
4.	Khasra No.	**For Mining (Sultanpur Unit)** 122/9// 9 min, 122/3// 3 min, 4, 5, 6, 7, 8 min, 14 min, 15, 16 min, 122/4// 10, 11, 12, 13, 16, 17, 18, 19, 20 min, 21, 22 min, 23 min, 24, 25, 122/ 5// 2, 3 min, 4, 5, 6, 7 min, 8, 14 min, 15 min, 122 min. For Ancillary area (Sultanpur Unit) 122/3// 11, 12, 19, 20, 21, 22, 122/6// 1, 2, 122//2 15, 16/1, 16/2, 25. **For Mining (Atwa Unit)** 9// 10 min, 11 min, 12 min, 13 min, 16 min, 17 min, 18, 19, 20, 21 min, 22 min, 23, 24, 25 8// 21 min, 22 min, 24 min, 25 min 15//, 2 min, 3 min, 4 min, 5, 6 min, 16//, 1, 2 min, 9 min, 10 10//, 4 min, 6 min, 7 min, 14 min, 15, 16 min, 17 min, 25/2 min. For Ancillary area (Atwa Unit) 14// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.		
5.	Total Lease area	33.42 Ha (Riverbed of Yamuna River)		
6.	Location of the project	Village- Sultanpur & Atwa, Taluk- Sultanpur, District- Palwal, Haryana		
7.	Toposheet No.	H43X8 - Project Site & H43X8, H43X12, G43F5 & G43F9 - Study Area.		
8.	Maximum Production Capacity	10,80,000 Metric Tonne / Year		
9.	Geological Mineral Reserve	13,53,456 Metric Tonne		
10.	Mineable Reserve	10,81,296 Metric Tonne		
11.	Geographical co-ordinates	**Point**	**Longitude**	**Latitude**
		SULTANPUR UNIT		
		G	28°03'56.67"N	77°29'6.04"E
		H	28°03'52.15"N	77°29'15.54"E
		I	28°03'48.25"N	77°29'10.35"E
		J	28°03'51.96"N	77°29'3.58"E
		Q	28°03'44.13"N	77°29'31.61"E
		R	28°03'36.68"N	77°29'27.15"E
		S	28°03'50.19"N	77°29'13.46"E
		ATWA UNIT		
		Q	28°01'58.42"N	77°30'17.83"E
		Q1	28°01'54.90"N	77°30'16.70"E
		R	28°01'56.46"N	77°30'24.26"E
		R1	28°01'52.50"N	77°30'23.70"E
		S	28°01'54.77"N	77°30'30.78"E
		S1	28°01'51.20"N	77°30'28.90"E
		T	28°01'52.97"N	77°30'36.54"E
		T1	28°01'49.00"N	77°30'36.20"E
		U	28°01'52.09"N	77°30'41.27"E
		U1	28°01'48.30"N	77°30'41.60"E

<table>
<tr><th>S. No.</th><th>Parameters</th><th>Description</th></tr>
<tr><td>12.</td><td>Topography of ML area</td><td>Highest elevation in riverbed at extreme north end is 181.30mRL and bank top level is 184.0 mRL whereas the levels at the extreme south end in riverbed is 176.00mRL and Riverbank top is 179.00 mRL.
The Yamuna River flows from NW to SE direction in Sultanpur revenue village whereas its direction of flow in Atwa area riverbed is almost west to east.</td></tr>
<tr><td>13.</td><td>Mining Method & Technology</td><td>Opencast manual method will be adopted. No specific method of exploration is required as the river borne sediments are deposited all along the riverbed and are very well exposed on the surface. Moreover, these sediments are accumulated/ replenished every year during rainy season by flood waters to almost the same level depending on the intensity of rains on the upstream side. Adequate quantity of sand reserves is available for meeting consumer demand.</td></tr>
<tr><td>14.</td><td>Ultimate depth of Mining</td><td>3 m from the riverbed of Yamuna River</td></tr>
<tr><td>15.</td><td>Ground water level</td><td>05 - 10 m from the surface level</td></tr>
<tr><td>16.</td><td>GWT intersection</td><td>Mining will be done only up to 3m from surface. So, ground water table will not be intersected.</td></tr>
<tr><td>17.</td><td>Drainage pattern/ water courses</td><td>Mining will be done in dry riverbed; stream will not be touched and will be done only during non-monsoon period.</td></tr>
<tr><td>18.</td><td>Water requirement & source</td><td>The source of water is private water tankers. The break-up of water requirement is as follows:
<table>
<tr><th>S. No.</th><th>Description</th><th>Demand</th></tr>
<tr><td>1</td><td>Dust Suppression</td><td>29.3 KLD</td></tr>
<tr><td>2</td><td>Greenbelt Development</td><td>7.9 KLD</td></tr>
<tr><td>3</td><td>Domestic Requirement</td><td>3.0 KLD</td></tr>
<tr><td colspan="2">Total</td><td>40.2 KLD</td></tr>
</table></td></tr>
<tr><td>19.</td><td>Cost of project</td><td>The capital cost for the project will be Rs. 10.18 Crores and machinery will be hired on contract bases.</td></tr>
</table>

Source: Approved Mining Plan

1.2. Nature of the Project

The Ministry of Environment, Forest, and Climate Change (MoEF&CC), Govt. of India through its notification of 14th September 2006 and its subsequent amendment under the Environment (Protection) Act, 1986 classifies the projects under Cat. B1. This is a project of minor mineral.

1.2.1. Need for the Project and Its importance to the Country and or Region

The demand for sand, gravel and boulders is increasing day by day construction activities & infrastructure development. With the rapid pace of development and industrialization, the demand of building material has enhanced manifold in the last 10-15 years and the demand of minor mineral has risen mainly in infrastructure activities like roads, highways, buildings & townships. Mining of minor minerals not only narrows the gap between the demand and supply of building material but also enhances employment opportunities and economic growth of the region.

Besides, the production will also benefit the State in the form of revenue generation. Also, the mine management will conduct medical camps at regular intervals.

1.2.2. Demand-Supply Gap

As already mentioned, there is a large demand of sand, gravel, and boulder (minor mineral) for construction activities which will be bridged to some extent by this project by various end users in the open market.

1.2.3. Imports vs. Indigenous Production

The minerals excavated from the proposed mine will be transported from the site towards NCR, Haryana, UP, Punjab, Himachal Pradesh etc. where it will be sold in the local market. The proposed mining project aims to cater only the need of domestic market.

1.2.4. Export Possibility

Not applicable as the production will be consumed within local area.

1.3. Location of the Project

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River with 10,80,000 MT/ year production over an area of 33.42 ha is located at Villages Sultanpur & Atwa, Tehsil & District Palwal and State Haryana. Lease area is well connected to nearest villages via village road.

Figure 1.1: Location Map of Proposed Project

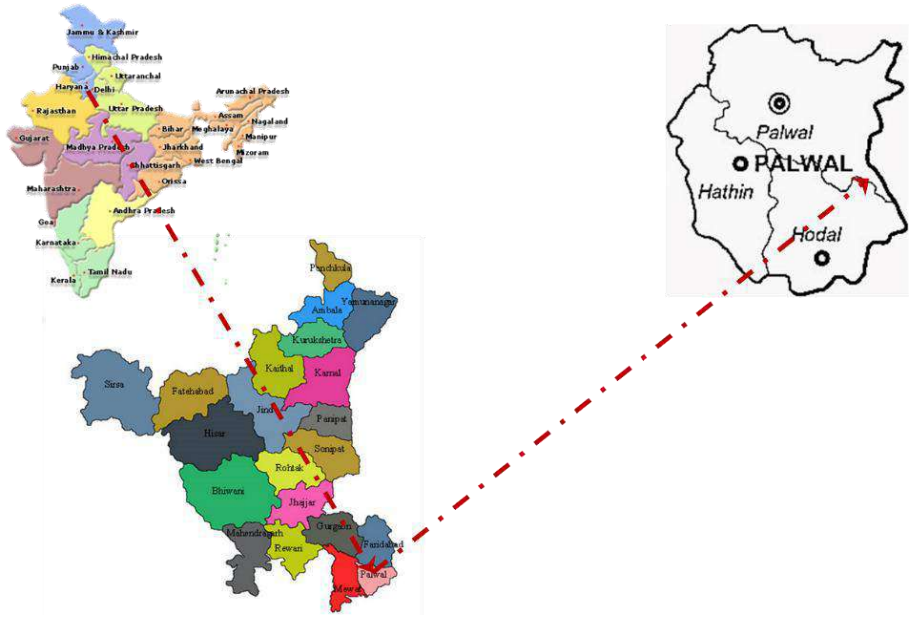


Figure 1.2: Co-Ordinates Map with 500 m Buffer from Proposed Site

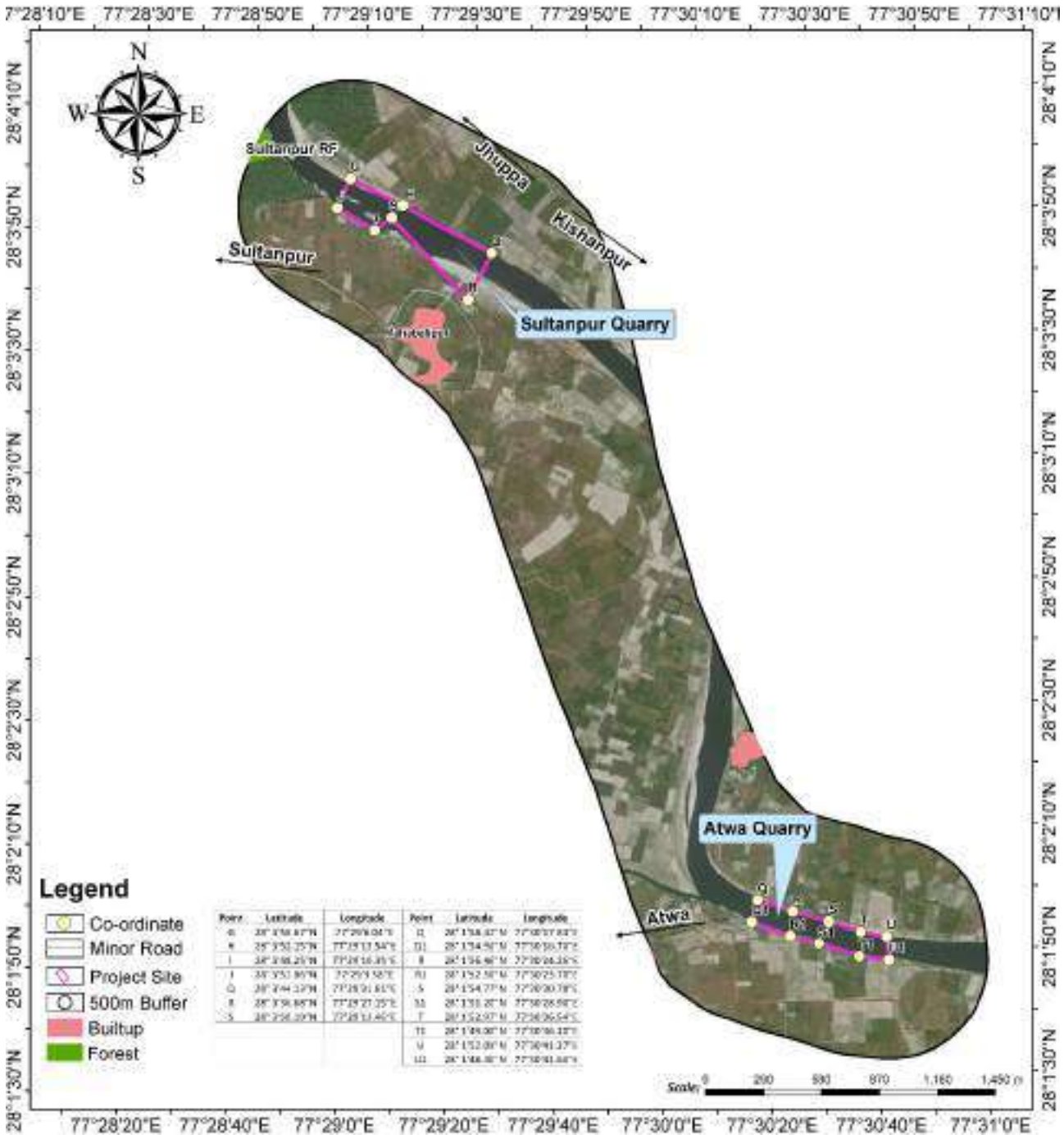


Figure 1.3: Base Map with 2 km Buffer Showing Site Features

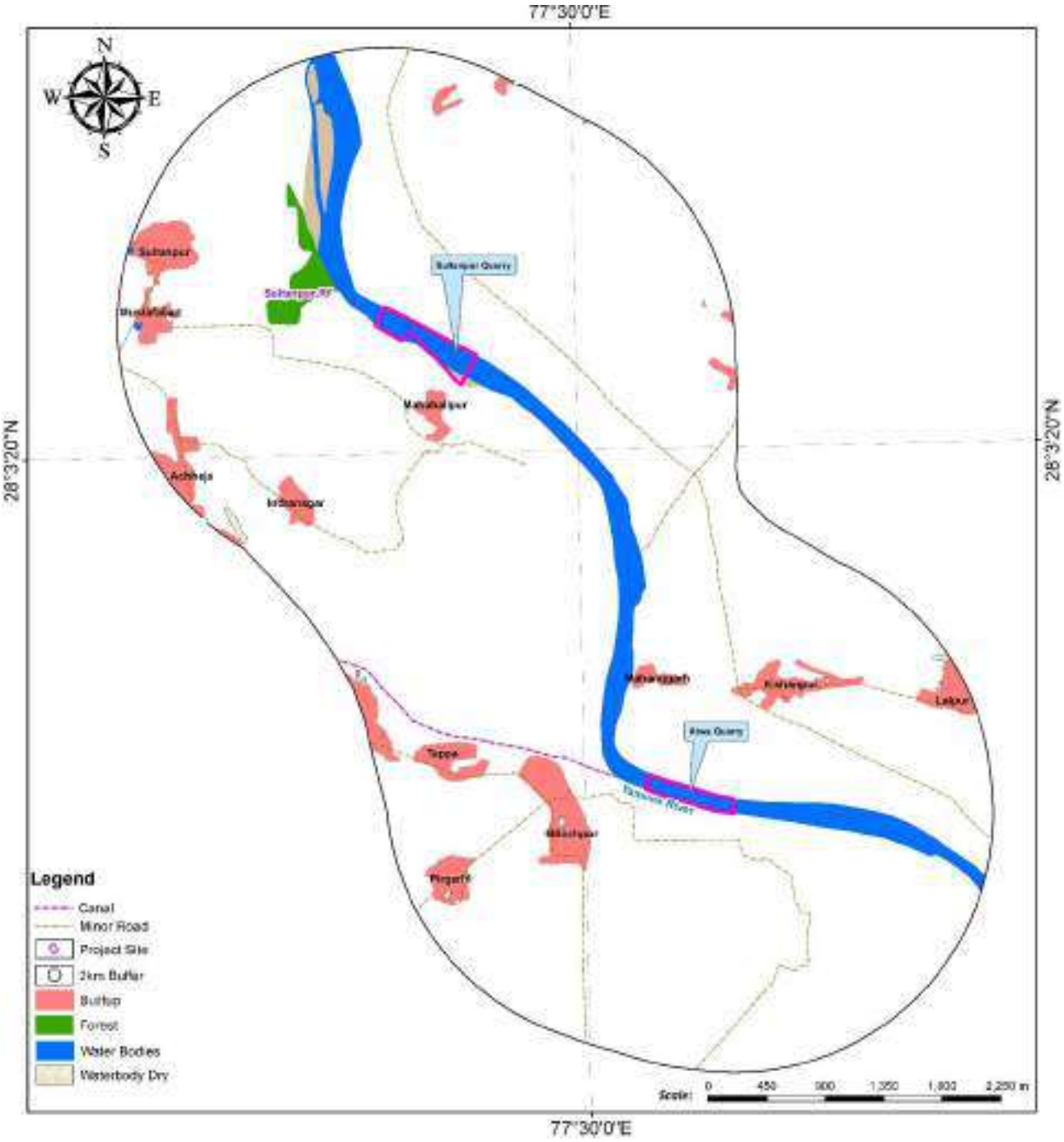
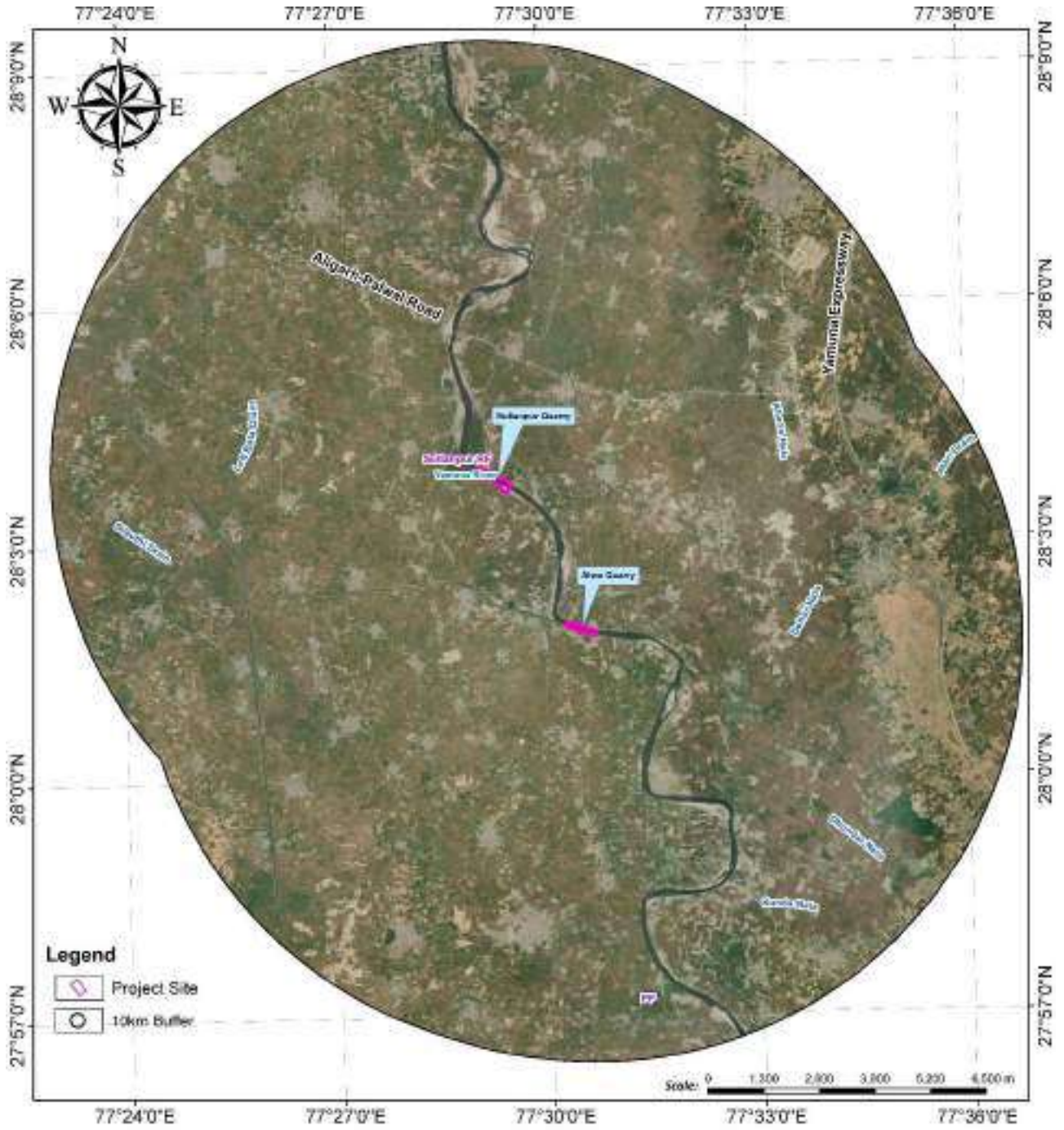


Figure 1.4: Google Map with 10 km Buffer from Proposed Site



1.4. Purpose of the Report

The purpose of the assessment is to ensure that decision makers consider the environmental impacts when deciding whether or not to proceed with a project. The International Association for Impact Assessment (IAIA) defines an environmental impact assessment as "the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made". EIA are unique in that they do not require adherence to a predetermined environmental outcome, but rather they require decision makers to account for environmental values in their decisions and to

justify those decisions considering detailed environmental studies and public comments on the potential environmental impacts.

The Environmental Impact Assessment has been prepared to assess the current environmental scenario of the area and then based on the activities of the mining proposed, to carry out Environment Management Plan (EMP). This plan will identify and address the impacts, where these are adverse in nature, and thereafter design mitigative measures to manage such impacts in a manner as to conserve environment and ecology of the area. The EMP has been prepared with a view to ultimately ensure that the adverse impacts are minimized if these cannot be prevented altogether.

1.5. The Study

This is the individual project as clarified in cluster mining certificate. In this context, Form-I and LOI along with approved Mining Plan has been submitted to Haryana State Environmental Impact Assessment Authority (Haryana SEIAA) on date 10.10.2022 (online) and a request for issue of "Terms of Reference" (ToR). The standard ToR was issued by State Level Environment Impact Assessment Authority, Haryana vide **File No. SEIAA/HR/2022/264 on dated 15.11.2022** which is enclosed as **Annex 1.5**. We have collected data for one season (post-monsoon) i.e., from October 2022 to December 2022. The point-wise compliance of the standard ToR with additional points is given in Table 1.3.

Table 1–3: Pointwise Compliance of Terms of Reference

Terms of Reference Issued by SEIAA, Haryana	Compliance
1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	Not applicable as this is the fresh lease.
2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	Letter of Intent has been issued by the Director Mines & Geology Haryana vide letter no. DMG/ HY/ SULTANPUR UNIT/ PALWAL/ 2022/ 5242 PANCHKULA dated 17-08-2022 for Mining of Sand (Minor Mineral) in Sultanpur Unit, comprising Sultanpur & Atwa villages over an area of 33.42 hectares in district Palwal, Haryana for a period of 8 years. Enclosed as **Annex 1.1**.
3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	All documents including approved mine plan, EIA are 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 M/s M. M. Traders. This is the draft report which will be submitted to PCB for public hearing.

Terms of Reference Issued by SEIAA, Haryana	Compliance
4) All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology, and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All the maps are superimposed on toposheet no.- H43X8 of SOI for project site and toposheet no.- H43X8, H43X12, G43F5 & G43F9 of SOI for study area of 10km. Co-ordinates of lease area are given in Table 1.2 and marked in figure 1.2. Other maps as land use were also prepared and given in report.
5) Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of landforms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	All the maps are prepared in SOI toposheet in 1:50,000 scale indicating the feature of site and surrounding. Study area map is enclosed as figure 4.1 and digitized land-use of study area is given in figure 3.3 of chapter 3.
6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	This is the sand mine project on riverbed of Yamuna River over an area of 33.42 ha located at Village Sultanpur, Tehsil & District Palwal and State Haryana. No diversion is proposed.
7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating 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.	The Safety, Health and Environmental (SHE) policy has been developed which will be accessible to all at site and to other stakeholders. The following key principles will be demonstrated: ✓ Integrate sound environmental management practices in all our activities by forming an Environmental Management Cell. ✓ Progressively adopt cleaner and energy efficient technologies. ✓ Conduct our operations in an environmentally responsible manner to comply with applicable legal and other requirements related to its environmental aspects and strive to go beyond. ✓ Biodiversity in and around our working areas and mines will be repeated and progressively enhanced for benefit of nature. ✓ Strive for continual improvement in our environmental performance by setting challenging targets, measuring progress, taking corrective action, and communicating environmental information to all concerned.

Terms of Reference Issued by SEIAA, Haryana	Compliance
	✓ Enhance environmental awareness amongst employees working for and on behalf of us and the general populace around working areas and mines. ✓ Encourage our business associates to adopt similar approach for environmental protection. Apart from this, EMC has been framed in hierarchical system to ensuring the implementation and adaptions of norms and EC conditions.
8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	This is the opencast mine from riverbed of river Yamuna. The maximum depth will be 3 m from the surface level and no activity will be involved in monsoon period. No blasting is involved. Mining operations are associated with several potential hazards that affect adversely the human health and environment as given below. ✓ Inundation due to flood. ✓ Accidents by heavy machinery. ✓ Slope failures at the mine faces etc. The detailed study has been done and incorporated in chapter 7 of report.
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.	The study area will comprise of 10 km zone around the mine lease from lease periphery. The maps have been given in chapter 1 & 4 marking study area and features. No waste will be generated from process except municipal waste.
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.	FCC imagery (Digital data) was used for interpretation for the relevant land use classes. On screen visual interpretation coupled with supervised image classification techniques are used to prepare the land use classification. ✓ Digitization of the study area (10 km radius from the plant site) from the Survey of India Toposheet maps. ✓ In the present study the Landsat satellite image with Toposheet no. 43X8, H43X12, G43F5 & G43F9 have been procured and interpreted using the ERDAS imaging software adopting the necessary interpretation techniques. ✓ Satellite data interpretation and vectorization of the resulting units.

Terms of Reference Issued by SEIAA, Haryana	Compliance
	✓ Field checking and ground truth validation. ✓ Composition of final LU/LC map. Study area is mainly covering agricultural land (88.94%) by following built-up area (5.41%) & open scrub (3.55%) of the total study area. For study area land-use details, refer section 3.3.2 of report and project site land-use at different stage is given in section 2.6.1 of report.
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.	No overburden or dump will be on project site. Storage, loading, unloading all the activities will be done in ancillary area.
12) A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	Clarification for No forest involved in proposed lease for both pits have been obtained vide **Reference No. (SRN): QC6-9N2-V919 dated 28.09.2022** for Sultanpur unit & **Reference No. (SRN): XU8-D8R-RJVJ dated 28.09.2022** for Atwa unit. No forest land is involved in project site. NOCs are enclosed as Annex 1.4.
13) Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	Not applicable as no forest land involved. NOCs enclosed as Annex 1.4.
14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not applicable.
15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	No applicable as no forest land involved, or no national park, sanctuary or biosphere reserve is coming within 10km study area.
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	Ecology assessment was carried in and around the lease area to study the wildlife of the area. 69 species of vertebrates could be seen in the vicinity of the proposed project. Only one Schedule I i.e., Pavo cristates, under Wildlife Protection Act, 1972, have been reported

Terms of Reference Issued by SEIAA, Haryana	Compliance
be worked out with cost implications, and submitted.	from the study area. Only one Schedule I i.e., Pavo cristates, under Wildlife Protection Act, 1972, have been reported from the study area. Conservation plan have been prepared for schedule I species and enclosed as **Annex 3.3**. Although these are very common species and found in every locality, even in villages, certain steps should be taken to conserve the critical wildlife: a) Programs for the conservation of wildlife will be formulated and implemented outside the protected areas by educating the local communities with help of local public agencies, and other stakeholders including the environment division officers of our company, to reduce the scope of man-animal conflict. b) It will be ensured that human activities on the fringe of the protected areas do not degrade the habitat.
17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/ (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	There is no wildlife sanctuary, elephant corridor, tiger reserve or any sensitive receptor within study area (10 km) from lease area. Clarification for No forest involved in proposed lease for both pits have been obtained vide Reference No. (SRN): QC6-9N2-V919 dated 28.09.2022 for Sultanpur unit & Reference No. (SRN): XU8-D8R-RJVJ dated 28.09.2022 for Atwa unit.
18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary	The present study on the floral & faunal assessment for the project activity is based on the field survey of the area. By the following forest inventory methodology, the survey of biological parameters has been conducted within the core zone and buffer zone (10 km radial distance) from project site at village- Sultanpur & Atwa, Tehsil & District- Palwal, Haryana, in accordance with the guidelines issued by the ministry of Environment, Forest and Climate Change, CPCB and SPCB during the study period. A preliminary survey of the study

Terms of Reference Issued by SEIAA, Haryana	Compliance
allocation of funds for implementing the same should be made as part of the project cost.	area has been performed to get a general picture of the landscapes in vegetation. The detailed study has been incorporated in report in section 3.8 of chapter 3.
19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.	Not applicable as project is not part of any declared critically polluted area.
20) Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not applicable.
21) R&R Plan/ compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, familywise, should be undertaken to assess their requirements, and action 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.	The project site is free from any habitat, the lease issued in name of proponent and the site is part of river Yamuna, So, there is no Project Affected Person (PAP) by the proposed mining activities. Hence, there is no need of R&R Plan.
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	Baseline data as collected in core as well as buffer zone of 10 km from the project boundary during post-monsoon season (October 2022 to December 2022) in accordance with the guidelines for preparation of EIA. ✓ A meteorological station was collected hourly for wind speed, wind direction, dry and wet bulb temperature, relative humidity, and general weather conditions were

Terms of Reference Issued by SEIAA, Haryana	Compliance
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.	recorded throughout the study period in an automated data logger. ✓ To assess the Ambient Air Quality (AAQ), samples of ambient air were collected by installation of Respirable Dust Sampler and Fine Particulate Sampler at different locations from the study area during study period and analysed for primary air pollutants to work out the existing status of air quality. ✓ Groundwater samples were collected during the study period from the existing hand-pumps and bore wells, while surface water was collected from nearest pond, rivers, and lakes. The samples were analysed for parameters necessary to determine water quality (based on IS: 10500: 2012, IS 3025 and APHA 23rd Edition, 2017 for ground water, water quality criteria classified by CPCB for surface water) and those which are relevant from the point of view of environmental impact of the proposed site. ✓ Soil samples were collected and analysed for relevant physical and chemical characteristics to assess the impact of the proposed plant on soil. ✓ The noise level measurements were also made at six locations in different intervals of time with the help of sound level meter to establish the baseline noise levels in the impact zone.
23) Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used, and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	Air quality modeling was done to for the cumulative impact identification. It is observed that the ground level concentration (GLC) decreases from 42.99 µg/m^3 at 50 m from the center line of the road to 5.62 µg/m^3 at 500 m for proposed mining lease with un-controlled way and 10.75 at 500 m to 1.40 µg/m^3 at 50 m from the center line of the road with controlled way respectively. These values have been predicted for a dry unpaved road. To mitigate the source

Terms of Reference Issued by SEIAA, Haryana	Compliance
	emission, following mitigation measure will be adopted. ✓ Water sprinkling will be done on the roads regularly. This will reduce dust emission further by 70-80%. ✓ Care will be taken to prevent spillage by covering the carrying vehicles with tarpaulin and sprinkling of water, if dry. ✓ Fortnightly scraping of road to keep the roads almost levelled. This will ensure smooth flow of vehicles and prevent spillage. ✓ Overloading will be kept under check by giving prior awareness. ✓ Proper Tuning of vehicles to keep the gas emissions under check. ✓ Plantation of trees along roads sides to help reduce the impact of dust in the nearby villages.
24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	The total water demand will be 40.2 KLD for the mining operation (dust suppression – 29.3 KLD), domestic use (3.0 KLD), and plantation purpose (7.9 KLD) which will be fulfilled by private water tankers. A budget of 0.6KLD municipal wastewater also will be generated which will be treated in septic tank & further may be utilized for water sprinkling. No discharge into the river will be ensured. Details of water demand, use and water balance have been given in section 4.8 of chapter 4.
25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Water will be sourced from private water tankers.
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.	Ground water level will not be intersected during mining. An amount of INR 3 lakh capital with 20 thousand recurring among has been secured for rainwater which will be constructed on nearby school or panchayat office. Budget details are given in table 10.9 of chapter 10.
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.	There is no major impact on water environment. Assessment of the adverse impact and indicate the proposed mitigation. For details, refer to section 4.8 & 4.10 of chapter 4.
28) Based on actual monitored data, it may clearly be shown whether working will intersect	The mining in the lease area will not intersect to the ground water level as this

Terms of Reference Issued by SEIAA, Haryana	Compliance
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.	is sandmining project from riverbed. The maximum depth of sand mine will be 3m as ultimate depth is limited up to 3.0 m as the water table is 5-10 m BGL and only mining will be done in dry seasons except monsoon and water stream will not be touched during mining. So, the chances of water pollution are very minimal. The domestic wastewater disposed from the mining activity may cause contamination of surface water. Ground water will not withdraw so permission is not required from CGWA.
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.	No stream modification or diversion is proposed for the mining operation and mining will be done only in dry area; water stream will not be touched.
30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	The maximum depth of sand mine will be 3m as ultimate depth is limited up to 3.0 m as the water table is 4-10 m BGL. For details refer section 4.10 of chapter 4.
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.	A suitable combination of trees (total 7900) that can grow fast and have good leaf cover to contain dust pollution shall be adopted to develop greenbelt. Greenbelt development will be done wherever possible. Plantation will be done within first 2 years and in later years maintenance will be ensured. The gap plants also will be ensured to complete the numbers of total plants. Neem, Peepal, Mango, Shisham, Sirish, Babool, Gulmohar and other local fruity plants will be planted along the haul roads, along the riverbanks, schools, public building, and other social forestry programme. For details, refer to section 10.7 of chapter 10.
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	During proposed mining, there will be an increase in traffic flow as two locations were identified for traffic survey location as one was in Baroli (Near Hasanpur Village which connect to NH 19) & other was on Hasanpur (Near Rasulpur Choraha which connect to Eastern Peripheral Exp.). Total 774 PCU/ day will increase in the existing traffic due to this mining activity. After commencement of the project, the projected traffic

Terms of Reference Issued by SEIAA, Haryana	Compliance
Transportation study as per Indian Road Congress Guidelines.	represents conditions of free flow (LOS Category "B") and represents a zone of stable flow conditions in 2023 & 2028 also which is convenience at all locations. From the above table, it can be concluded that the incremental load on the carrying capacity of the concerned road is not likely to have any adverse effect or impact.
33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Because it is riverbed mining project so there is not any provision of adequate infrastructure and other facilities will be provided to mine worker within mine lease area. Office and rest shelter will be installed in ancillary area.
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.	The mining activity in the mine site will be converted into the pit which will be replenished during monsoon season each year. No pit will remain on site. Detailed replenishment plan will be prepared, and approval will be obtained from concerned department.
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.	Open cast method involves dust generation by excavation, loading and transportation of mineral. At site, during excavation and loading activity, dust is main pollutant which affects the health of workers whereas environmental and climatic conditions also generate the health problems. Occupational health hazard has been identified and risk matrix was developed. For details, refer to section 7.3.7 of chapter 7.
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.	Following health related hazards were identified in open cast mining operations to the workers: a. Light: The workers may be exposed to the risk of poor illumination or excessive brightness. The effects are eye strain, headache, eye pain and lachrymation, congestion around the cornea and eye fatigue. In present case, the mining activity is done during daytime only. b. Heat and Humidity: The most common physical hazard is heat. The direct effects of heat exposure are burns, heat exhaustion, heat stroke and heat cramps; the indirect effects are decreased efficiency, increased

Terms of Reference Issued by SEIAA, Haryana	Compliance
	fatigue, and enhanced accident rates. Heat and humidity are encountered in hot and humid condition when temperatures and air temperatures increase in summer up to 46.10C or above in the riverbed mining area. c. Eye Irritation: - During the high windy days in summer the dust could be the problems for eyes like itching and watering of eyes. d. Respiratory Problems: Large amounts of dust in air can be a health hazard, exacerbating respiratory disorders such as asthma and irritating the lungs and bronchial passages. e. Noise Induced Hearing Loss: Machinery is the main source of noise pollution at the mine site. Occupational health hazard has been identified and risk matrix was developed. For details, refer to section 7.3.7 of chapter 7.
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.	The broad activities proposed under ESR initiative along with financial implications and year wise allocation of funds is shown in Table 9.8 of chapter 9. The salient features of the programme are as follows: ✓ Social welfare program like provision of medical facilities educational facilities, water supply for the employees as well as for nearby villagers will be taken. ✓ A well laid plan for employment of the local people has been prepared by giving priority to local people. ✓ Supplementing Govt. efforts in health monitoring camps, social welfare, and various awareness programs among the rural population. ✓ Assisting social plantation program. ✓ Adoption of villages for general development. ✓ Supply of water to village nearby villages. ✓ Development of facilities within villages like roads, etc.

Terms of Reference Issued by SEIAA, Haryana	Compliance
38) Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	The environmental management must be integrated into the process of mine planning so that ecological balance of the area is maintained, and adverse effects are minimized. An Environmental Management Plan (EMP) is a site-specific plan developed to ensure that the project is implemented in an environmentally sustainable manner. An effective EMP ensures the application of best practice environment management to a project. For details, refer to chapter 9 of report.
39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	This is the draft EIA report. As per the conditions of the ToR and the EIA Notification 2006 and its amendment, a Public Hearing will be conducted by Haryana State Pollution Control Board at Mine Site as per the provisions of EIA Notification, S.O. 1533 dated 14.09.2006 and its amendment for Environmental Clearance of Mine Lease.
40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation identified.
41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The detailed activity-wise has been calculated which are INR 26.0 Lakhs as a Capital Cost and INR 6.90 Lakhs per annum as a Recurring cost, respectively. Total budget of INR 60.5 Lakh for environmental measurements has been ensured by the developer. For details, refer to section 10.10 of report.
42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	The DMP has been prepared based on the Risk Assessment and related findings covered in the report. The objectives of DMP are to describe the company's emergency preparedness, organization, the resource availability, and response actions applicable to deal with various types of situations that can occur at mines in shortest possible time. For details, refer to section 9.4 of 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.	The execution of the project brings overall improvement in the locality, neighbourhood, and the State by bringing up to industry, roads, infrastructure sectors and employment generation at local level. Hence it will be helpful for the economic growth and support to enhance

Terms of Reference Issued by SEIAA, Haryana	Compliance
	quality of life through employment. For details, refer to section 8.2 of report.
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.	Complied.
b) Where data are presented in the Report especially in Tables, the period in which the data were collected, and the sources should be indicated.	Complied.
c) Project Proponent shall enclose all the analysis/ testing reports of water, air, soil, noise etc. using the MoEF&CC/ NABL accredited laboratories. All the original analysis/ testing reports should be available during appraisal of the Project.	Complied. Annexure 3.2.
d) Where the documents provided are in a language other than English, an English translation should be provided.	Noted, complied.
e) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Noted, will be submitted with final EIA, this is draft report.
f) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August 2009, which are available on the website of this Ministry, should be followed.	Noted.
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.	Noted, no change has been done.
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,	This is fresh lease, not applicable.

Terms of Reference Issued by SEIAA, Haryana	Compliance
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.	Enclosed in chapter 2. (Surface Geological Map – Figure 2.6, Working Production Plan – Figure 2.7 & Environment Plan - 2.12)

Source: Terms of Reference issued by SEIAA, Haryana

1.5.1. Scope of the Study

The Scope and objective of the study includes following issues:

- Understanding the basic project activities and make a detailed review of policy and regulations.
- To study and analysis, the anticipated impacts of the proposed project on overall baseline environmental and socioeconomic conditions in its surrounding study area.
- To identify environmental sensitive features within the study area and places of architectural and cultural importance, if any, and its safeguarding.
- To recommend project specific appropriate preventive and mitigative measures to minimize pollution, environmental and social disturbances during entire life-cycle period of the project.
- To adopt suitable environmental action plans and management systems, to implement and monitor the appropriate mitigative measures.

Field studies for the project were conducted for the post-monsoon season (October 2022 to December 2022) to determine the existing conditions of various environmental attributes as outlined in **Table 1.4**.

Table 1–4: Environmental Attributes and Frequency of Monitoring

S. No.	Attributes	Parameters	Frequency
1	Ambient Air Quality	PM_{10}, $PM_{2.5}$, SO_2, NO_X & CO	Twice a week for one season as per CPCB guidelines at 8 locations.
2	Meteorology	Wind speed and direction, temperature, relative humidity & rainfall.	Near to project site at one location for one season continue hourly recording as per norms.
3	Water quality	Physical, Chemical and Bacteriological parameters	Once in a season (Surface Water at 3 & Ground Water 5 Locations)
4	Ecology	Existing terrestrial and aquatic flora and fauna within 10km radius circle.	Primary Inventorization and Secondary data was collected from the forest department.
5	Noise levels	Noise levels in dB(A)	Once in a season (24 hours) at 6 locations.
6	Soil Characteristics	Physico-chemical soil quality	Once during study period at 06 locations.

S. No.	Attributes	Parameters	Frequency
7	Land use	Land use classification for different categories	Based on Toposheets (SOI) and Satellite imagery.
8	Socio-economic Pattern	Demographic and Working Status	Based on Census of India, 2011 and primary consultation.
9	Hydrology	Drainage Pattern and nature of streams	Based on data collected from secondary sources like Survey of India Maps, Hydrology Atlas of India, CGWB etc.
10	Risk assessment and Disaster Management	Identification of areas where disaster can occur by fires and release of toxic substances	Site specific Hazard Identification and Risk assessment was done initially (As and when there is change in stored quantity of hazardous materials or process at site).

Source: Guidelines of Central Pollution Control Board, New Delhi

1.5.2. Methodology of the Study

The Environment Impact Assessment study was carried out as given in TOR which includes Identification, assessment, Quantitative Evaluation and Prediction of possible impacts. To minimize impact due to the proposed project on various environmental components, an impact identification matrix has been prepared, while the assessment of impacts has been based on mathematical models and/or scientific knowledge and judgment.

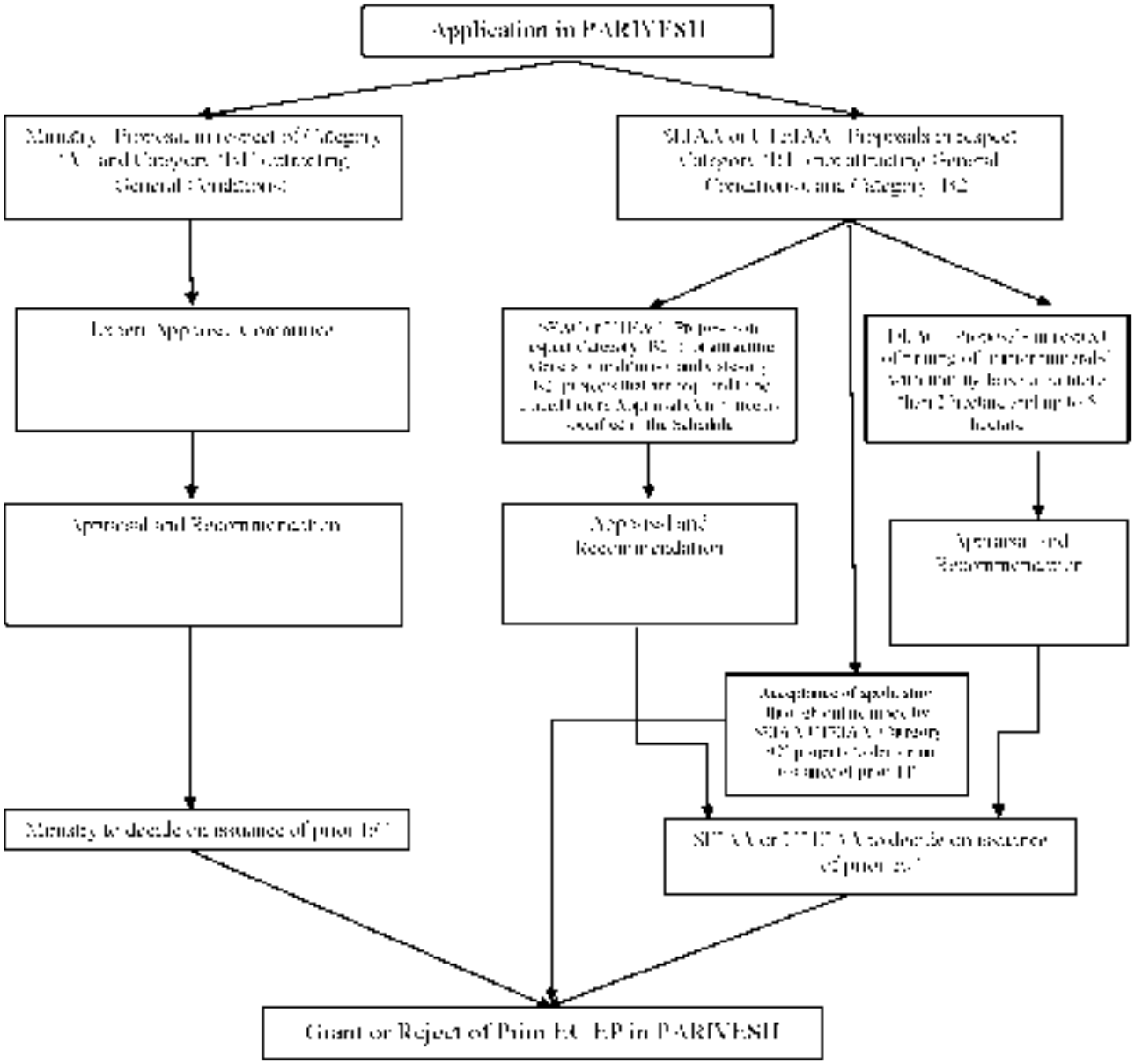
- Existing environmental status of the environment components was assessed. Identification and quantification of significant impacts of the proposed project on these environment components was carried out. The work carried is briefly reported below and has been elaborated in subsequent chapters.
- Predominant wind direction expected during the period of baseline monitoring in the study area as recorded by India Meteorological Department.
- Topography and location of surface water bodies like ponds, canals, and rivers.
- Location of villages/towns/sensitive areas.
- Identified pollution pocket, if any, within the study area.
- Accessibility, power availability and security of monitoring equipment.
- Areas which represent baseline conditions; and
- Collection, collation, and analysis of baseline data for various environmental attributes.

1.6. Environment Clearance Process

Environmental clearance of any new project or expansion of existing projects is now done as per the notification of the Ministry of Environment and Forest & Climate Change (MoEF&CC), Govt. of India dated 14th September 2006 and subsequently amended. This notification requires prior environmental clearance of all projects from competent central govt. or state govt. authorities, as may be the case. The projects are further classified into Category 'A' or Category 'B' projects based on spatial extent of potential impacts on human health, natural and man-made resources. Category 'A' projects require prior clearance by the MoEF&CC, Govt. of India while the Category 'B' projects must get clearance from the State Level Environment Impact Assessment Authority (SEIAA), constituted by the Central Government for this purpose. The environment clearance procedure for new projects requires maximum of four stages all of which may not be applicable

to all the projects. The process of environmental clearance for the proposed project is shown in the schematic diagram below given as Figure 1.5.

Figure 1.5: Schematic Diagram for Environmental Clearances Process



These four stages are as follows:

Stage 1- Screening: It refers to the definite assignment of environmental category to projects or activities. In case of Category 'B' projects scrutiny of application at State level to categorize project in 'B1' or 'B2' is done. The 'B2' projects do not require EIA Reports.

Stage 2 - Scoping: It refers to the process where EAC or SEAC determines detailed and comprehensive ToR for the EIA report and can also include site visits by the committee if required. But this process excludes construction projects such as township/ commercial complex / housing complex, etc.

Stage 3- Public Consultation: It refers to the process by which the concerns and views of local people and other stakeholders are ascertained and taken into consideration regarding the project. The Public Consultation takes part in two steps: Public Hearing and written responses.

Stage 4- Appraisal: This refers to detailed scrutiny of the application and EIA report to make categorical recommendations to the regulatory authority.

1.7. Legislative & Regulatory Framework

The environmental regulations, legislation as and policy guidelines and control that may impact the project are the responsibility of a variety of Government agencies. The principal environmental regulatory agency in India is the Ministry of Environment and Forest & Climate Change (MoEF&CC), Delhi. MoEF&CC formulates environmental policies and accords environmental clearance for different projects. The relevant standards, which are of significance to the proposed project, are discussed in the section below.

Table 1–5: Key Environmental Legislation

Rules / Act	Scope and Objectives	Applicable Agencies
Water (Prevention and Control of Pollution) Act 1974 and Amendment Act, 2014.	To provide for prevention & control of water pollution and enhancing water quality	Central and State Pollution Control Boards
The Air (Prevention and Control of Pollution) Act, 1981	To provide for the prevention and control of air pollution.	CPCB & SPCB
Forest Conservation Act 1980 & Forest (Conservation) Rules, 2003	To halt rapid deforestation & resulting environment degradation.	GoI.
Environment Protection Act 1986, Amendments 1993.	To provide for the protection and improvement of environment.	GoI, MoEF&CC.
Noise Pollution (Regulation and control) (Amendment) Rules, 2010	To control & take measures for abatement of noise and ensure that level does not cross standard.	GoI, Nodal Agencies of MoEF&CC & State Govt.
Hazardous and Other Wastes (Management& Transboundary Movement) Amendment Rules, 2019	To the adequate handling of hazardous materials or wastes.	Central Government, Nodal Agencies MoEF&CC, CPCB
Solid Waste Management Rules 2016	To regulate the management and handling of the municipal or domestic solid wastes	CPCB, SPCB, State Govt. and Municipal Authority

Source: (i) MoEF&CC and CPCB

1.8. Report Structure

The overall contents of the EIA report have been prepared as per the generic structure (Appendix III) of EIA Notification issued by Ministry of Environment & Forests and Climate Change (MoEF&CC), Govt. of India on 14th September 2006 and subsequent amendments. The report consists of eleven chapters. The content of the chapters is briefly described in this section.

Chapter-1 Introduction: This chapter contains the general information on the mining of minerals, major sources of environmental impacts in respect of mining projects and details of environmental clearance process.

Chapter-2 Project Description: In this chapter the proponent should also furnish detailed description of the proposed project, such as the type of the project, need for the project, project location, layout, project activities during construction and operational phases, capacity of the project, project operation i.e., land availability, utilities (power and water supply) and

infrastructure facilities such as roads, railways, housing, and other requirements. If the project site is near a sensitive area, it is to be mentioned clearly why an alternative site could not be considered. The project implementation schedule estimated cost of development as well as operation etc. should be also included.

Chapter-3 Description of the Environment: This chapter should cover baseline data in the project area and study area.

Chapter-4 Anticipated Environmental Impacts Assessment & Mitigation Measures: This chapter describes the anticipated impacts on the environment and mitigation measures. The method of assessment of impacts including studies carried out, modelling techniques adopted to assess the impacts where pertinent should be elaborated in this chapter. It should give the details of the impacts on the baseline parameters, both during the construction and operational phases and suggests the mitigation measures to be implemented by the proponent.

Chapter-5 Analysis of Alternatives (Technology & Site): This chapter gives details of various alternatives both in respect of location of site and technologies to be deployed in case the initial scoping exercise considers such a need.

Chapter-6 Environment Monitoring Program: This chapter should cover the planned environmental monitoring program. It should also include the technical aspects of monitoring the effectiveness of mitigation measures.

Chapter-7 Additional Studies: This chapter should cover the details of the additional studies required in addition to those specified in the ToR and which are necessary to cater to more specific issues applicable to the project.

Chapter-8 Project Benefits: This chapter should cover the benefits accruing to the locality, neighbourhood, region, and nation. It should bring out details of benefits by way of improvements in the physical infrastructure, social infrastructure, employment potential and other tangible benefits.

Chapter-9 Environmental Cost Benefit Analysis: This chapter should cover on Environmental Cost Benefit Analysis of the project.

Chapter-10 Environmental Management Plan: This chapter should comprehensively present the Environmental Management Plan (EMP), which includes the administrative and technical setup, summary matrix of EMP, the cost involved to implement the EMP, both during the construction and operational phase and provisions made towards the same in the cost estimates of project construction and operation. This chapter should also describe the proposed post-monitoring scheme as well as inter-organizational arrangements for effective implementation of the mitigation measures.

Chapter-11 Summary & Conclusion: This chapter gives the summary of the full EIA report condensed to ten A-4 size pages at the maximum. It should provide the overall justification for implementation of the project and should explain how the adverse effects have been mitigated.

Chapter-12 Disclosure of the Consultant: This chapter should include the names of the consultants engaged with their brief resume and nature of consultancy rendered.

CHAPTER – 02

PROJECT DESCRIPTION

2. Project Description

2.1. General

The most important life nourishing systems of nature are a freshwater ecosystem, in which rivers are important and play a major role in the terrestrial and aquatic ecosystem. It transfers the water and minerals from the terrestrial environment to ocean. In India, there are many perennial, annual and seasonal or non-perennial rivers which provide many natural resources like Sand, Gravel, and Boulder. These materials are beneficial for the development of a country in way of urbanization and industries. Riverbed mining is the process of removal of sand, gravel, and boulders from the river. The name of this raw material is based upon their size like if the size of material >256 mm then it is categorized as boulders and size varies between 64-256 mm Cobbles, Gravel/ Pebbles size varies between (2-64 mm) are divided into 5 types because of their Different Sizes, if size varies between 32-64 mm very coarse gravel, 16-32 mm coarse gravel, 8-16 mm medium gravel, 4-8 mm fine gravel, 2-4 mm very fine gravel. Sand is a movable, non-cohesive granular material whose size varies between 0.063 mm and 2 mm 4. Sand also divided into 4 types because of the different size, very coarse sand (1-2 mm), coarse sand (0.5-1 mm), medium sand (0.25-0.5 mm), fine sand (125- 250 µm), and very fine sand (62.5-125 µm) respectively. Also, as per the Indian Standard Soil Classification System (ISSCS) Boulder - > 300 mm in diameter, Gravel - 300 - 2 mm in diameter, Sand < 2mm in diameter. The term sand is used to cover almost any rock or mineral, but technically it is limited to quartz sand with a minor impurity of mica, iron oxides and feldspar. Sand and gravel occur as sedimentary beds, lenses and pockets lying on or close to the surface or inter-bedded with other sedimentary formations. They take place in the river channel and floodplain deposits, fluvial glacial deposits, seashore deposits, windblown deposits along and near water bodies, marine and freshwater sedimentary beds, and desert sand dune. The sand acts as a buffer against strong tidal waves and storm surges by reducing their impact as they reach the shore and it also a habitat for crustacean species and other related marine organisms. The riverbed mining activity is done in whole the world to construct the buildings, roads and supports urbanization.

2.2. Location of Project

M/s M. M. Traders proposed a mining project for mineral sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ year production over an area of 33.42 ha located at Villages Sultanpur & Atwa, Tehsil & District Palwal and State Haryana. This is a fresh lease. Khasra & Jamabandi details of lease area are enclosed as **Annex 2.1**.

The toposheet details for project site & study area is given below:

- ✓ The proposed project is covered in toposheet no.- H43X8 of SOI.
- ✓ Study area is falling within toposheet no.- H43X8, H43X12, G43F5 & G43F9 of SOI.

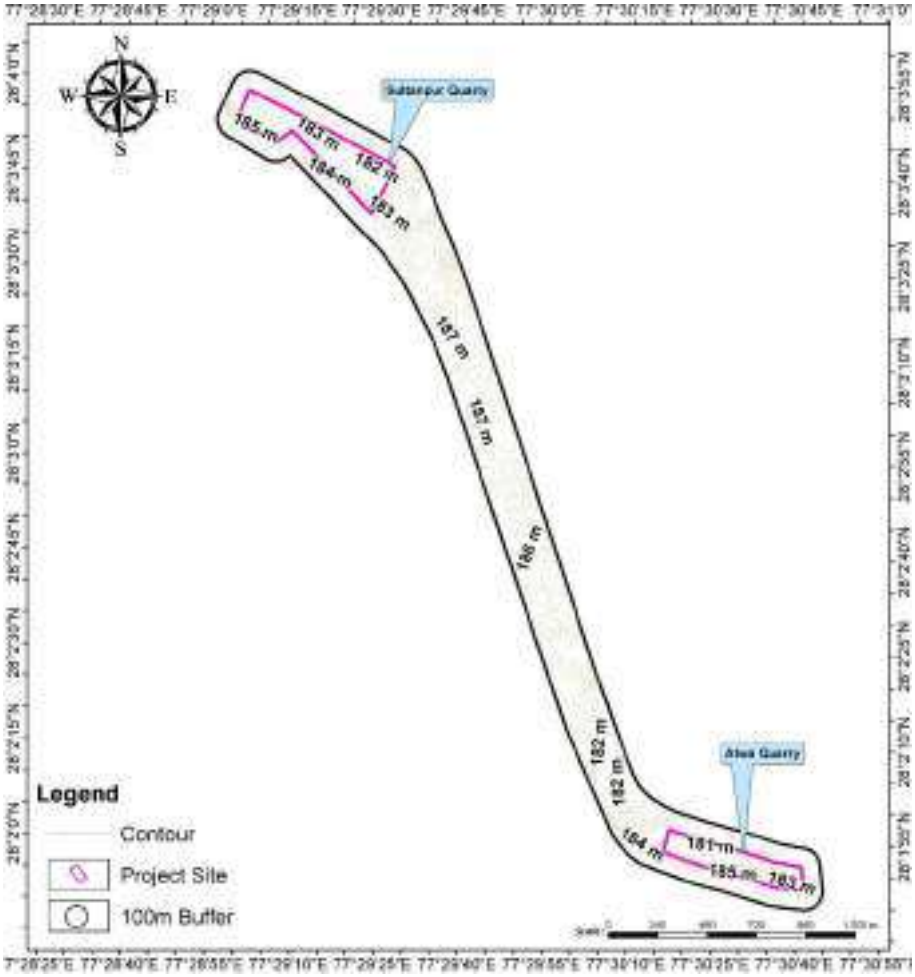
2.3. Mine Details

2.3.1. Topography

Highest elevation in riverbed at extreme north end is 181.30mRL and bank top level is 184.0 mRL whereas the levels at the extreme south end in riverbed is 176.00mRL and Riverbank top is 179.00 mRL. The Yamuna River flows from NW to SE direction in Sultanpur revenue village whereas its direction of flow in Atwa area riverbed is almost west to east. Difference between

highest and lowest elevation of both pits is approx. 2-3 m. Contour map with 100m buffer from site & Elevation Map / Slope Map of Study area are given as Figure 2.2 & Figure 2.3.

Figure 2.1: Contour Map with 100m Buffer Site Elevation / Slope



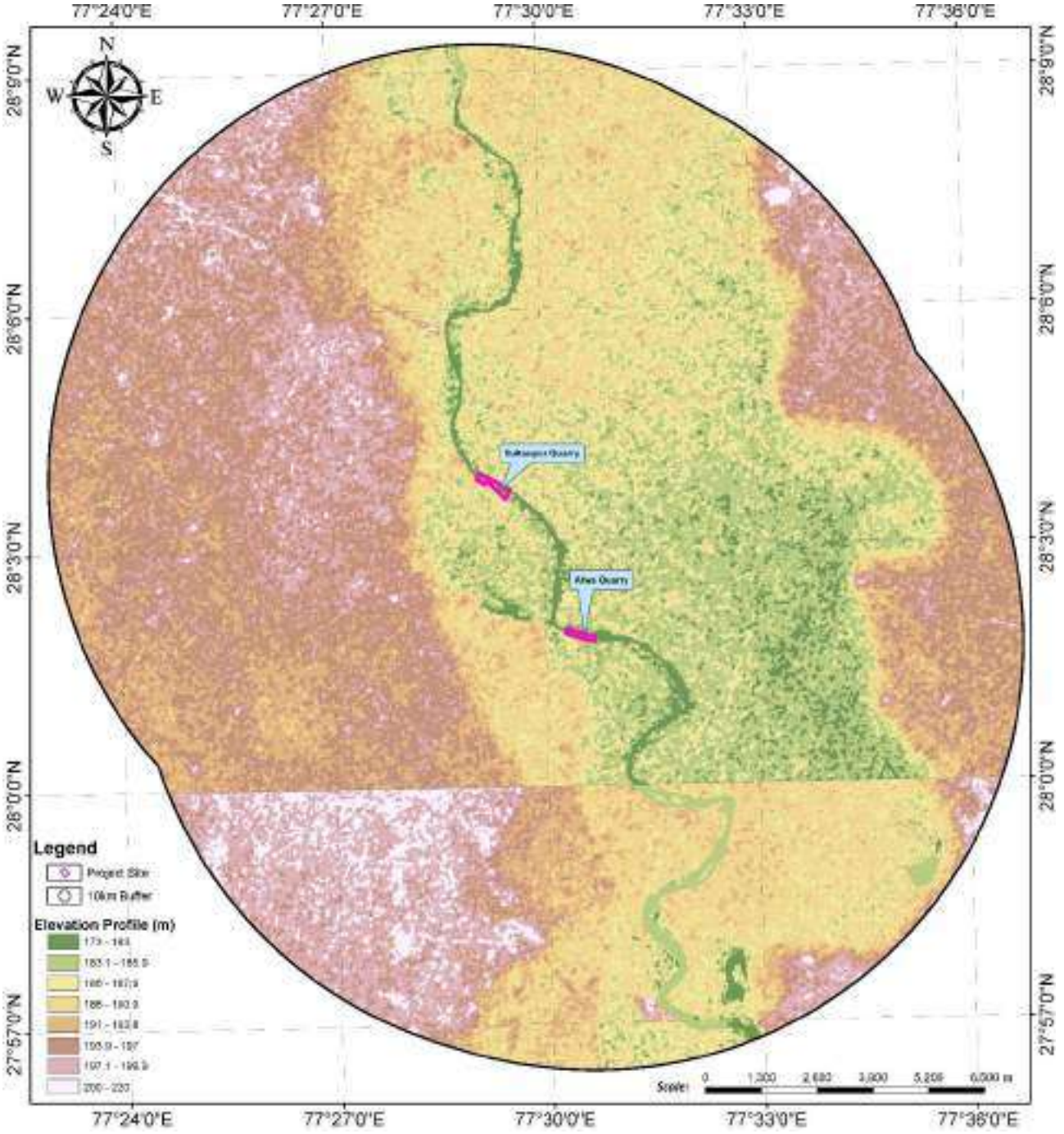
The levels of the riverbed and bank area of the proposed mining area are as under.

Table 2-1: Levels of Riverbed and Riverbank

Location	Riverbed levels (mRL)	Riverbank top levels(mRL)	River area village
E-400	181.30	184.00	Sultanpur
E-500	181.25	184.00	
E-600	181.20	183.70	
E-700	181.07	183.50	
E-800	180.50	183.00	
E-900	180.25	182.50	
E-1000	179.60	182.00	
E-1100	179.50	181.50	
E-1200	179.00	181.00	
E-300	177.40	180.53	Atwa
E-400	177.33	180.30	
E-500	177.10	180.15	
E-600	177.00	180.10	
E-700	176.92	180.00	
E-800	176.60	179.80	
E-900	176.35	179.50	

Location	Riverbed levels (mRL)	Riverbank top levels(mRL)	River area village
E-1000	176.00	179.00	
E-1050	176.00	179.00	

Figure 2.2: Elevation / Slope Profile of Study Area

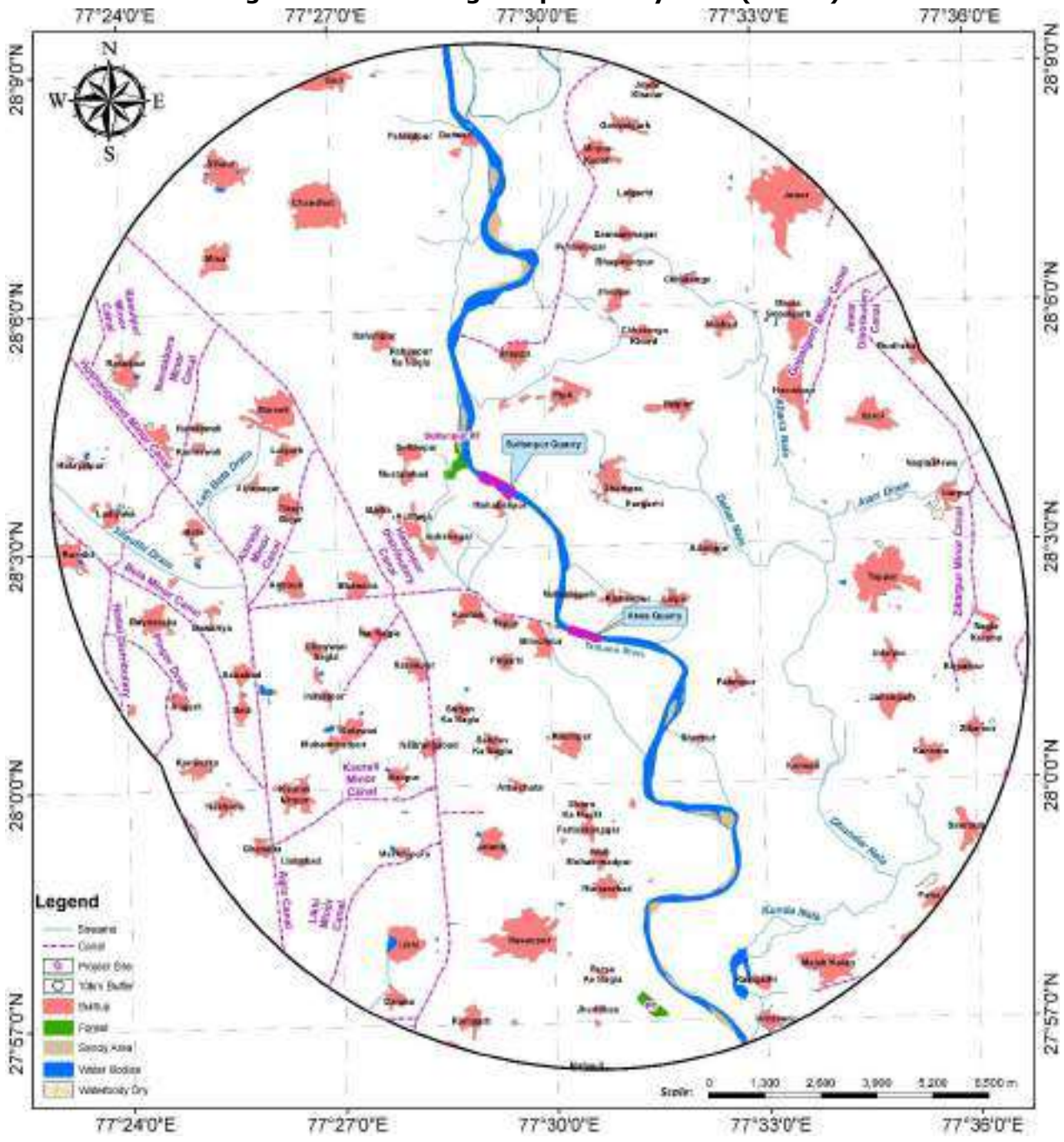


2.3.2. Drainage Pattern / Mine Drainage

Mining will be done in dry riverbed; stream will not be touched and will be done only during non-monsoon period. Palwal district of Haryana lies between 27°50':28°15' north latitudes and 77°05':77°33' east longitudes. Total geographical area of the district is 1364.55 sq.km. Administratively, Palwal is the district Headquarter of the district. It is divided into 4 development blocks namely Palwal, Hathin, Hodal and Hasanpur. The district area is bounded on western side

Mewet district, Eastern side by U.P. state and northern side by Faridabad district and falls in survey of India toposheets no. 53H/3, H/4, H/7, H/8, H/9, H/12, and 54E/5 and E/9. There are two main canals Agra canal and Gurgaon canal which passes through western and central part of the district respectively from north to south. In the northern part of the district Budia nala is flowing from east to west and discharges its rainy water in river Yamuna. The Gaunchi main drain passes through north south direction of the district running in between Agra canal and Gurgaon canal has carried-out round water exploration besides other hydro geological and geophysical studies in the district.

Figure 2.3: Drainage Map of Study Area (10 km)



2.4. Geology and Exploration

2.4.1. Regional Geological Setup

The regional geology of Distt. Faridabad & Palwal (Haryana) is represented by varieties of formations belonging to Delhi Super Group. Stratigraphically the rock formations of Delhi super group are composed of arenaceous, argillaceous & calcareous sediments. These sediments have been placed by Heron (1923) in the Alwar & Ajabgarh series of Delhi system & intruded by basic granitic rocks. The general succession of Delhi system can be represented as follows: (Das, Gupta S.P. 1968).

Figure 2.4: Geology Map of Haryana State

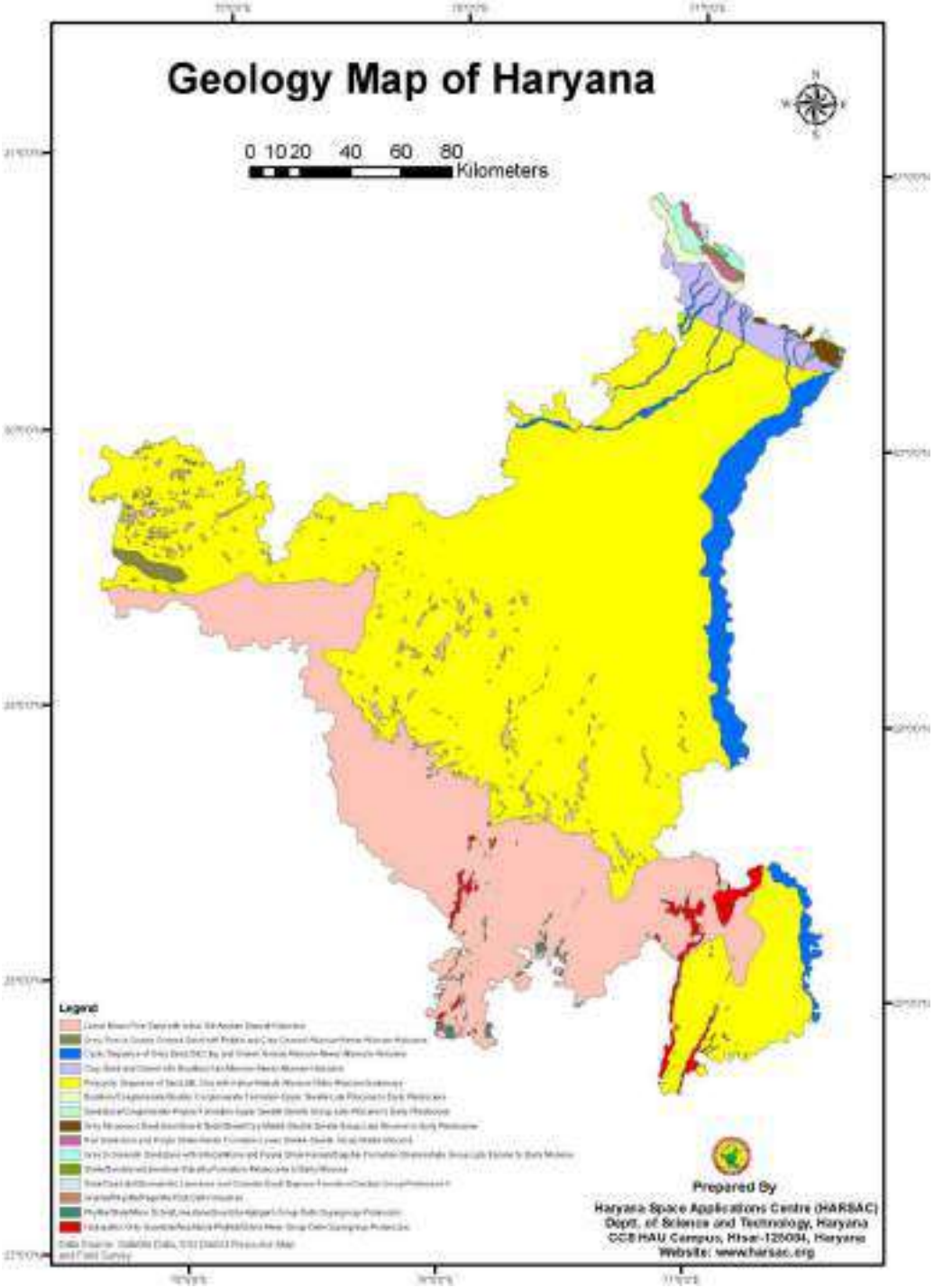


Table 2-2: Regional Geology of Palwal District

Series	Rock Types
Recent intrusive	Alluvium, dune sand, soil, ankerite, chert, quartz veins, younger basic dykes. Granites, Pegmatites, Quartz veins Older basic rocks.
Ajabgarh series	Carbonaceous phyllites & schists etc. (Local).
	Massive Quartzites.
	Phyllites, Mica-shists (Local).
	Marble, calc-gneiss, amphibolite etc.
	Schist with or without garnet. Staurolite, Kyanite, Sillimanite, Andalusite, phyllites, sandy phyllites.
Alwar series	Amphibole quartzite, marble, Amphibolite's.
	Arko sic quartzites, quartzites & Interrelated phyllite & schists. Magnetite & Hematite quartzites etc.
	Phyllite & schists.

2.4.2. Local Geology

Yamuna River meanders through the area & deposits the sands during monsoon floods in the area. That sand found in Distt. Palwal are Alluvial sediments of fluvial deposits brought down from Himalayas from the upstream side by river Yamuna and its tributaries which have variable thickness depending upon the original landform on which deposition took place. The river sand is most recent deposit of clean sand deposited by river Yamuna and is being reworked every year. The litho units encountered in the riverbed are younger sedimentary formations in nature and are brought by river water from high reaches of Himalayan range of hills of Himachal Pradesh. The sediments are river borne and have been deposited in the riverbed and its flood plains.

GEOLOGY OF THE AREA: The sediments of the riverbed are of recent nature. These sediments have been brought by river water and deposited in the bed of Yamuna River. The following sequence of formations has been observed in the area:

- Soil/Alluvium
- Sand

Description of Formation:

Description of formations found in the area are as under:

Soil/ alluvium: The finer sediments have been deposited in the flood plains of the Yamuna River.

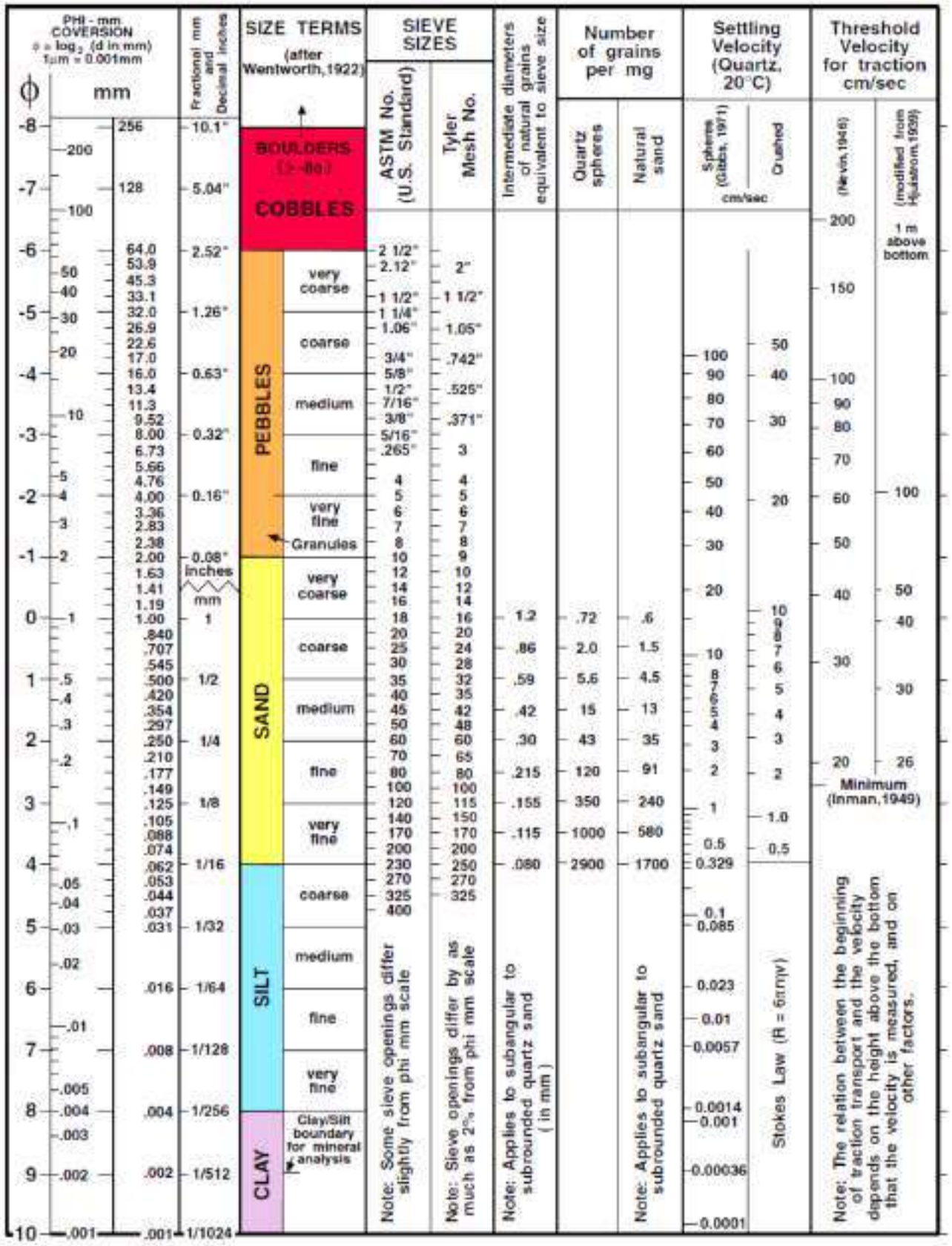
Sand: Sediments of less than 1-3 mm size are predominantly deposited in the riverbed by flood waters during rainy season. There is no perfect classification between Sand and Silt. They have been deposited in a mixed state. As usual the larger size sediments are deposited at the bottom and the smaller sizes are deposited at the top, on the edges/flanks of the riverbed.

However, during shifting of the river course towards East about five hundred years back, silt was deposited on top in thicker layers up to 3 meters in some cases underlain by about 6-15 meters of sand.

Sediments of various sizes and in mixed form are predominantly deposited in the riverbed and there is no perfect classification between sediments. These may be called as coarse sand, medium sand, and fine sand.

The term sand is used to denote an aggregate of mineral or rock grains greater than 1/16mm and less than 2 mm in diameter.

Figure 2.5: Size Distribution of Mineral



PHYSICAL CHARACTERISTIC OF MINERAL: Technically, sand is merely a size category. Sand is particulate matter that's larger than silt and smaller than gravel. Different specialists set different limits for sand:

Engineers call sand anything between 0.074 and 2 millimetres, or between a U.S. standard #200 sieve and a #10 sieve.

Soil scientists classify grains between 0.05 and 2 mm as sand, or between sieves #270 and #10. Sedimentologists put sand between 0.062 mm (1/16 mm) and 2 mm on the Wentworth scale, or 4 to −1 unit on the phi scale, or between sieves #230 and #10. In some other nations a metric definition is used instead, between 0.1 and 1 mm.

From a geological viewpoint, sand is anything small enough to be carried by the wind but big enough that it doesn't stay in the air, roughly 0.06 to 1.5 millimetres. It indicates a vigorous environment.

SAND COMPOSITION AND SHAPE: Most sand is made of quartz or its microcrystalline cousin chalcedony because that common mineral is resistant to weathering. The farther from its source rock sand is, the closer it is to impure quartz. But Yamuna sands contain quartz grains, tiny bits of rock (lithics), or dark minerals like limestone and ferruginous concretions.

The size of the sediments is variable. The grains whether small or large are rounded in shape. Sand is grey, brown in colour, coarse to fine grained. The present deposits are of good quality and can be used for building industries. There is no other use of this material.

2.4.3. Replenishment Plan

ORIGIN & CONTROL OF MINERALISATION (ANNUAL REPLENISHMENT OF MINERAL IN RIVERBED AREA vis-à-vis 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 it also includes deposits from glacial ice and those materials 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 sediment logy.

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 affect 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.
- ✓ Highly Dissected pediment.
- ✓ Un dissected pediment.

a) Distribution of Basin Area River wise (Area in Sq. Km or Sq. Miles).
b) Drainage System/Pattern of the area (Drainage Density = ……. Km/Sq. Km of Yamuna River.
c) Rainfall &Climate: Year wise Rainfall data for previous 8 years of Yamuna Basin/River.
d) 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 each river system and is very much interrelated to the hydrological cycle in a river basin.

The rivers originating from the Himalayas bring with them lots of aggregate materials whereas as they move downstream, only finer elements / minerals like sand are found in abundance. River Yamuna near Dak Patthar barrage leaves Uttarakhand and enters Himachal Pradesh.

The Yamuna River is the biggest tributary of the river Ganga in North India. Its source in the Yamunotri glacier at an elevation of 6387 m on Southwestern sides of Bander pooch crests in the lower Himalayan ranges. The overall span of the Yamuna River is 1376 Kms (855 miles) with catchment area of 366223 square km (141,399 square mile). This encompasses 40.2 % of the whole Ganga valley, prior to joining Ganga at Triveni Sangam in Allahabad (UP)

ITINERARY OF YAMUNA RIVER AND ITS TRIBUTARIES: The river passes through many states such as Uttarakhand, UP, Haryana, going across to HP and then Delhi. With yearly discharge of around 10,000 cubic billion meters (cbm) and consumption of 4400 cbm (of which irrigation comprises 96%), the river represents above 70% of water provision of Delhi. Yamuna water are fairly good quality for its entire span from Yamunotri in Himalayan ranges to Wazirabad in Delhi, the length of which is around 375 Kms.

ITINERARY OF DRAINAGE AREA OF YAMUNA: The origin of Yamuna is situated in the Yamunotri glacier at an elevation of 6387 m on SE sides of Bander pooch crests, which are in the Mussoorie range of lower Himalayan range in Uttarkashi district of Uttarakhand, to the North of Haridwar. From this place Yamuna runs to South around 200 Kms across the Shivalik mountain ranges and lower Himalayan ranges. A significant portion of its beginning of Drainage basin (with total area of 217.00 square km) is situated in HP and a major tributary sapping the upper drainage basin in the Tons, which is also biggest and most extensive tributary of the Yamuna. Other tributaries in the area are the Rishi Ganga, Giri, Hanuman Ganga, Kunta& Bata, which sap the upper drainage basin of the huge Yamuna River. Subsequently, the river moves down the terrains of Doon basin at Dak Patthar close to Dehradun, in this place water is redirected into a channel for the purpose of electricity generation. Once it goes across the Sikh religious place of Ponta Sahib, the river arrives at Tajewala in the YAMUNANAGAR district of Haryana where a dam was constructed in 1873. This dam is the origin of the two major channels or water courses – Eastern Yamuna Canal and Western Yamuna Canal and both drain in UP & Haryana. The Western Yamuna Canal (WYC) traverses Karnal, Yamuna Nagar and Panipat prior to arriving at the Haider pur water treatment plant, which provides a portion of municipal water provisions of Delhi. The Yamuna also forms natural boundary between the states of Uttarakhand & HP and amid the states of UP and Haryana. Together with the Ganga to which it flows almost parallel once it meets the Indo-Gangetic plateau, the biggest Alluvial productive area in the World, it forms the Ganges-Yamuna Doab are stretched across 69,000 square Km which is 33% of the whole area.

Table of Drainage Basin area of River Yamuna (square KM/square mile) with % of Drainage Basin.

Table 2-3: Basin Area of Yamuna River

S. No.	State	Drainage Basin Area
1)	HP	5799/2240 (1.6 %)

S. No.	State	Drainage Basin Area
2)	UP & Uttarakhand	74208/142 (21.50 %)
3)	Rajasthan	102883/39739 (29.80%)
4)	Haryana	21265/8214(6.5%)
5)	Delhi	1485/574(0.4%)
6)	MP	14023/5416 (40.6%)

DANDY & BOLTON FORMULA FOR CALCULATION OF SEDIMENT YIELD: Dandy & Bolton formula is often used to check whether the sedimentation yield exceeds the replenishment rate but the whole question is whether there is adequate monitoring of the river basin, the answer is no as hydrological stations are sparsely spread. The formula uses catchment area and mean annual runoff as key determinants to give a yield value. It does not differentiate in basin wide smaller streams and their characteristics. CWC distinguishes river basins as classified and non-classified, as per the latest hydrological data for unclassified River basins; there are 122 GDSW (Gauge, Discharge, Sediment & Water Quality) sites in 12 such basins, the number was 147 in 2005. This brings in context the whole issue of scientific mining, thereby indicating that the monitoring of sediment yield in rivers / streams within the river basins is essential to arrive at extraction rates and express and conduct environmental studies based on these basin wide characteristics which should become part of the 'Terms of Reference'.

SEDIMENT YIELD VERSUS DRAINAGE AREA: Dandy and Bolton studied sedimentation data from about 1500 reservoirs, ponds, and sediment detention basins. In developing their formulas, they used data from about 800 of these reservoirs with drainage areas greater than or equal to 1 mi2. The smaller watersheds-those of drainage area less than 1 mi^2-were excluded because of their large variability of sediments yield, reflecting the diverse effects of soils, local terrain, vegetation, land use, and agricultural practices.

For drainage areas between 1 and 30,000 mi^2, Dandy and Bolton found that the annual sediment yield per unit area was inversely related to the 0.16 power of the drainage area:

In which S= sediment yield in tons per square mile per year; SR = Reference sediment yield

Corresponding to a 1-mi^2 drainage area, equal to 1645 tons per year; A = drainage area in square miles; and AR = reference drainage area (1 mi2)

SEDIMENTS YIELD VERSUS MEAN ANNUAL RUNOFF: Dandy and Bolton studied sedimentation data from 505 reservoirs having mean annual runoff data. Annual sediment yield per unit area was shown to increase sharply as mean annual runoff Q in- creased from 0 to 2 in. Thereafter, for mean annual runoff from 2 to 50 in. annual sediment yield per unit area decreased exponentially.

This led to the following equations.

For Q <2 in.:

For Q >2 in.:

In which QR **=** reference mean annual runoff QR **=** 2 in.

Dandy and Bolton combined Equation 15-10 and 15-11 into a set of equations to express sediment yield in terms of drainage area and mean annual runoff.

For Q <2 in.:

For Q >2 in.:

Sec: 15.2 Sediment Productions.

For SR = 1645 tons/mi2/y, QR = 2 in., and AR = 1 mi2, Eq. 15-12 reduces to the followings:

For Q <2 in.: S = 1280 Q0.46 (1.43 – 0.26 log A)

For Q >2 in.: S = 1965e-0.055Q (1.43 – 0.26 log A)

Equations 5-12 and 5-13 are based on average values of grouped data; therefore, they should be used with caution. In Certain cases, local factors such as soils, geology, topography, land use, and vegetation may have greater influence on sediment yield than either mean annual runoff or drainage area. Nevertheless, these equations provide a first approximation to be of sediment yield for watershed planning purposes.

Calculation of Sediment Yield for Sand Mine of Sultanpur Block

Total Targeted Production is 10.80 Lakh MT/year.

- ✓ Area under riverbed: 25.06 Hect.
- ✓ Drainage basin area of river Yamuna and is tributaries in Haryana: 8214 square miles.
- ✓ Normal Annual Rainfall of Yamuna catchment are district (1978 to 2005) :1076mm or 42.36 inch.

With above inputs, the calculation of the sediment yield by the Dandy and Bolton formula is illustrated below:

Sample Set	S.No.	Q (in inches)	A (in square mile)	S
	1	3.5	150	1400.823
	2	27.4	8214	179.4756

$$S = 1965\, e^{-0.055Q}[1.43 - 0.26 \log(A)]$$

Dandy & Boltan formula also says that actual sediments yield from individual drainage basins may vary 10-fold or even 100-fold from computed yields. Since itinerary of river Yamuna indicates that its basis comprises of sediment rocks with good average rainfall therefore there are fair chances of yield of sediments to be 50-fold of computed results hence Actual Sediment Yield will be about 20-25 Lakh Tones / Annum

The equations express the general relationships between sediment yield runoff and drainage area. They may provide a quick rough approximation of mean sediment yields on a regional basis for preliminary watershed planning. Because Dandy & Bolton have derived the equation form average values computed sediment yields normally would be low for highly erosive area and high for well stabilized drainage basins with high plant density. Factors which have direct bearing on sediments yield & limitations of Dandy & Bolton equation.

Sediment yield of a sediment basin has direct impact of local terrain, climate, vegetation, soils, agricultural practices & land use pattern of catchment area of the sediment basin aforesaid factors varies from basin to basin therefore, Dandy & Bolton has category stated that use of the equation to predict sediment yield for a specific location would be unwise because of the wide variability caused by local factors not considered in the equation development. Actual sediment yield form individual drainage basins may vary 10-fold or even 100-fold from computed yields.

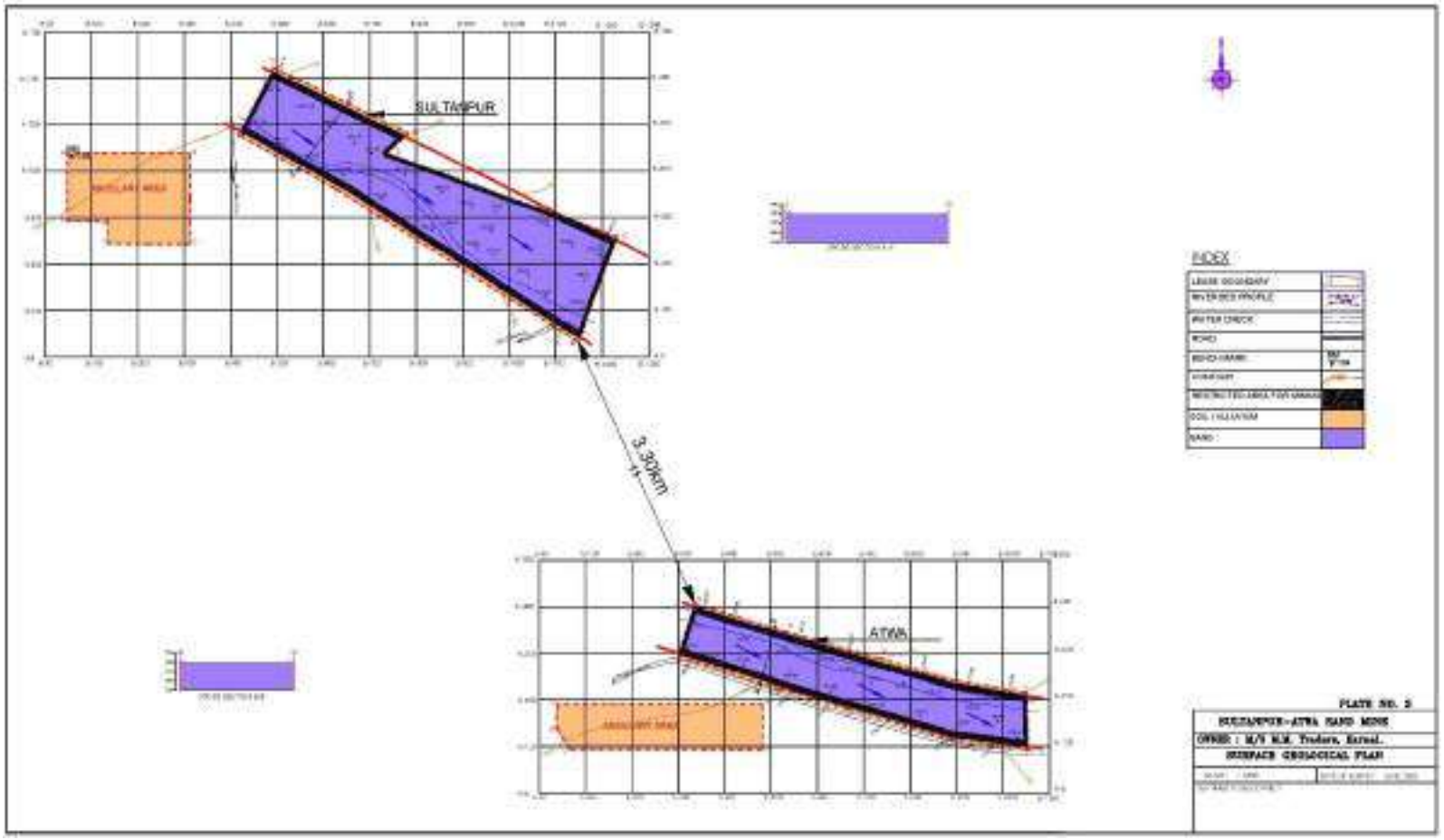
GRADE USE OF SAND: The minor mineral sand is made of quartz or quartzite/its microcrystalline cousin chalcedony because that common mineral is resistant to weathering. Sands contain quartz, feldspar grains, tiny bits of rock (lithics), or dark minerals like ilmenite and magnetite.

The size of the sediments is variable. The grains whether small or large are rounded in shape. Sand is mainly grey, brown in colour, coarse to fine grained. The present deposits are of good quality and can be used for building industries. There is no other use of this material.

2.4.4. Exploration of Area

No specific method of exploration is required as the river borne sediments are deposited all along the riverbed and are very well exposed on the surface. Moreover, these sediments are accumulated/ replenished every year during rainy season by flood waters to almost the same level depending on the intensity of rains on the upstream side. Adequate quantity of sand reserves is available for meeting consumer demand.

Figure 2.6: Surface Geological Map of Lease



2.4.5. RESERVE

METHOD OF ESTIMATION OF RESERVE: Volumetric method is adopted for calculating reserves of sand. Reserves are estimated based on established width, thickness, and strike length based on influence of the mineralized formation in the riverbed. Where good inferences are available only such area are considered for reserve estimation. The depth is considered up to 3.0 m as working is permitted up to 3.0m depth in the riverbed.

GEOLOGICAL & MINEABLE RESERVES

PROVED RESERVES: Following special conditions which are applicable for excavation of minor mineral(s) from riverbeds to ensure safety of riverbeds, structures and the adjoining areas are considered while calculating the reserves of this area:

- **a.** No mining would be permissible in a riverbed up to five times of the span of a bridge on up-stream side and ten times the span of such bridge on down-stream side, subject to a minimum of 250 meters on the up-stream side and 500 meters on the down-stream side.
- **b.** There shall be maintained an un-mined block of 50 meters width after every block of 1000 meters over which mining is undertaken or at such distance as may be directed by the Director or any officer authorized by him.
- **c.** The maximum depth of mining in the riverbed shall not exceed three meters from the un-mined bed level at any point in time with proper bench formation.
- **d.** Mining shall be restricted within the central 3/4th width of the river/ rivulet.
- **e.** A barrier of 7.5 m width will be left from the lease boundary, if falling in the riverbed.

b) River is not having any water flow during post monsoon period and sand bed remains dry.

Mineral reserves are calculated up to 3 m depth from riverbed surface RL.

- **a.** Mineral Reserves falling in the riverbed area has been calculated taking the maximum permissible depth of 3 m from the riverbed surface RL.
- **b.** The bulk density of Sand is considered 1.80.
- **c.** Volumetric method is adopted for calculating reserves of Sand.
- **d.** The mineable reserves are calculated by deducting “Blocked Geological Reserves on account of riverbanks, lease boundary, railway line, highways, bridges, (wherever applicable) from total proved Geological Reserves”.
- **e.** It is considered that riverbed Sand shall be replenished every year as evident from preceding paragraph (3.2.6) on “Annual Replenishment of Mineral in Riverbed Area vis-à-vis Sedimentation”.

UNFC classification – Codes of UNFC are followed for reserve calculation.

- **a.** UNFC is a three-digit code-based system, the economic viability axis representing the first digit, the feasibility axis the second digit and the geological axis the third digit. Each digit provided.
- **b.** Codes 1, 2 and 3 in decreasing order. The highest category of resources under UNFC system has code (111) and for lowest category the code is (334).
- **c.** Code (111): This code is provided for the economically mineable part of the measured mineral resources (proved category reserves).
- **d.** Code (121): This code is provided for the economically mineable part of the indicated mineral resources (probable category reserves).

e. Code (211): The part of the measured mineral resources (proved category), which as per feasibility study has not found economically mineable. The reserves blocked in 7.5 meters buffer zone and 50 meters from permanent structure.

f. Code (222): The part of the indicated mineral resources (probable category), which as per feasibility study has not found economically mineable. The reserves blocked in 7.5 meters buffer zone and 50 meters from permanent structure.

g. Code (480): Tonnage, Grade and mineral contents can be estimated with low level of confidence and resources are also inferred from geological.

The reserves of Sand calculated by volumetric method. All reserves are proved reserves. Details are given as below.

1) The entire reserves of Sand up to the depth of 3.0 m are calculated.
2) The bulk density of sand is considered 1.80 MT/CUM.
3) The reserves of Sand calculated by volumetric method and are summarized here below: Reserves in MT= Area in acres x4000X depth 3.0mx Bulk Density 1.80

Table 2-4: Geological Reserve Estimation

Mining area in acres	Ancillary area in acres	Geological Reserves MT	Blocked area in acres	Blocked reserves MT	Mineable reserves MT	Targeted Production
62.66	20.98	1353456	5.04	2,72,160	10,81,296	10,80,000

A. PROVED RESERVES AS PER UNFC CODE (111)

Total Geological reserves: 62.66 x4000 x3.0x1.80 = 13,53,456 MT

B. BLOCKED RESERVES AS PER UNFC CODE (211 & 222)

Blocked area =5.04 acres)

Total Blocked reserves= 5.04 x 4000x 3 x1.80 = 2,72,160 MT

C. MINEABLE RESERVES

(A-B) = 10,81,296 MT

D. TARGETED PRODUCTION

10,80,000 MT per Year up to the lease period (or say 1.080 million MT/year)

E. BALANCE RESERVES & LIFE OF MINE

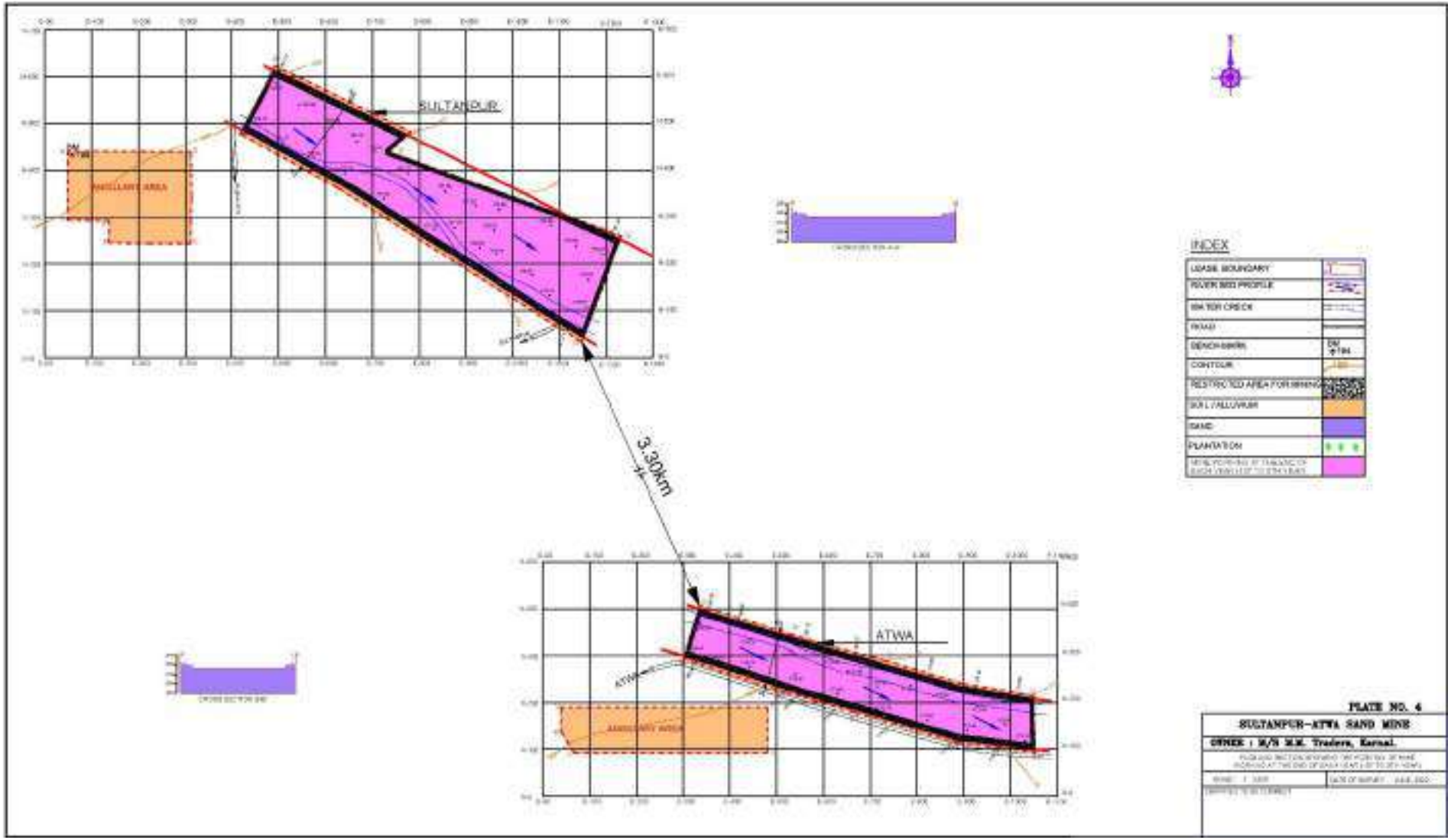
For Balance reserves it is presumed that the mineral will be replenished every year during the rainy season. New mineral will be added every year in the riverbed**.**

Period of Anticipated life of mine cannot be estimated accurately in the riverbed since the quantum of sand replenished every year depend on the intensity of flood waters from upstream side and proposed rate of production.

2.5. Mining methodology

Mining work will be carried out by opencast manual method by forming one bench of 3 m high in riverbed. There are no existing pits at present as the mining activities are closed for the last few years. The sand will be excavated by backhoe type excavators directly loading into dumpers/ trucks for dispatch to consumers situated in and around Delhi/NCR. Loading of mineral shall be mechanical, while transport of mineral out by the riverbed shall be done through private truck owners.

Figure 2.7: Working / Production Plan



Riverbed mining is for extracting sand from Yamuna Riverbed. As per Haryana Minor Mineral Concession Rules, 2012 extraction is limited to 3.0 m depth only. Major part of the Riverbed remains dry except rainy season. Area available for mining is 25.06 ha in district –Palwal. Total length of the area as per the description report stretches in the length of 1.50 km. Mining activity will be carried out in allocated areas only.

Activities will be carried out as per the production schedule given earlier. The mining quarry will be working as self-sustained units with all facilities like site office, rest shelter, first aid and drinking water etc. All these mines will be connected suitably with communication system.

Light weight excavators/JCB will be deployed for extraction. Mineral will be removed in 3.0 m layer only forming one bench. This is as per the digging depth of the equipment. Mineral will be loaded in trucks of 25 tons capacity. Trucks and equipment will be on hire basis. There will be no OB or waste generation as the sand is exposed in the riverbed.

Bench will advance parallel to the banks of the river. Height of bench will be 3.0 m. Width of the bench will be around 20.0 m. Workings will be restricted within the lease area/ khasra as per the description report given by Mining Department. Mining activities will be carried out in a manner so that there is no obstruction to the movement of water flow, if any, during rainy season. The bench will be in the form of slices/ strips parallel to the banks of the river. Roads in the lease area for the movement of loaded trippers/ trucks will not have slopes more than 1 in 20. However, movement of trucks after mineral loading will be towards both sides through approach roads connecting to tar roads. Every block will have its own approach roads, well connected to main highways. No processing of mineral will be done.

Salient Points of Proposed Scientific Mining are:

a) First requirement is to ascertain the maximum depth to which mineral is available and safe depth of working which has been fixed as 3.0 m in riverbed in virgin areas.
b) All proposed pits have been proposed for further deepening and widening up to the above proposed depths.
c) The depth of pit below the surface shall not exceed 3.0m in virgin areas where mining operations to some depths have not been carried out provided mining operations are carried out by formation of benches in accordance with the provisions of MMR 1961.
d) The contractor shall comply with all other conditions and stipulations as given in the LOI and Auction document dated 25-05-2022.
e) No mining operation may be carried out from 01-07 to 15-09 every year (rainy season).
f) Mining will be carried out about in about 270 days in a year.

2.5.1. Proposed Method of Mining

Mining activity will be carried out by open cast manual method.

- ✓ Light weight excavators will be used for digging & loading of mineral in tippers.
- ✓ No OB/ waste material will be produced.
- ✓ No drilling/ blasting is required as the material is loose in nature.
- ✓ Proper benching of 3.0 m height will be maintained.
- ✓ Roads will be properly made and sprayed by water for suppression of dust.
- ✓ Roads in the lease area for the movement of loaded trippers/ trucks will not have slopes more than 1 in 20.
- ✓ Total extent of lease is 1.50 km.

- ✓ Extraction activities will start in the blocks from the upstream side to downstream side. This will not obstruct the movement of water, if any, during monsoon period in the river course.
- ✓ 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. n case during any period, the replenishment was found less than 3 m or depth of exaction, the mining during said period would restrict to depth which would not be more than 3 m of the original level of the riverbed.

As per MMR 1961, following precautions shall be undertaken during operations of HEMM.

Shovel/ excavator: -

- ✓ Excavators will be provided with efficient warning devices, front & rear lights, and efficient brakes.
- ✓ Excavator will be under the charge of a competent person authorized in writing by the manager designated as operator.
- ✓ No person other than the operator or his helper if any will ride on the excavator or even enter the excavator's cabin.
- ✓ No person will be permitted to ride in the bucket of a Shovel/ excavator.
- ✓ No inflammable material will be stored in the excavator housing or cab.
- ✓ Shovel/ excavator dippers will be lowered to the ground during greasing operation.
- ✓ When a Shovel/ excavator is to be moved from one point to another its boom shall be kept in strict alignment with direction of travel while the bucket/ dipper shall be held m above the ground.
- ✓ No Shovel/ excavator will be operated in the position where any part of the machines, suspended loads or lines are brought closer than 3 m to the exposed high voltage line.
- ✓ Every movement of a Shovel/ excavator shall be preceded by warning signals.
- ✓ When not in use, the Shovel/ excavator will be moved to and stood on stable ground, the bucket shall be kept resting on stable ground and will never be left hanging.
- ✓ The Shovel/ excavator will be so spaced that there will be no danger of accident from flying & falling objects.
- ✓ Safety appliances, booms will be examined thoroughly once in a year.
- ✓ Emergency switches, safety limit switches will be examined and tested once in four months.
- ✓ All brakes will be tested for their operation worthiness once in a week.
- ✓ The following signboards will be carried in and around the machine: -
  - ➢ "Warning— Do Not Enter the Working Range of the Machine".
  - ➢ "Lubricating Prohibited While the Machine in Running Condition".

Duties of Shovel/ excavator operator: -

At the commencement of every shift the operator will personally inspect and test the machine, paying special attention to the following details: -

i. The brakes and every warning device are in working order.
ii. Lights are in working order.
iii. The operator will neither take out the machine for work nor will he work the machine unless he is satisfied that it is mechanically shown and in efficient working order.

iv. The operator will maintain a record of every inspection made in a bond paged book, kept for the purpose, and shall sign every entry made their in.
v. The operator will keep the cab window clean to ensure clear vision at all times.
vi. The operator will not operate the machine when persons are in such proximity as to be endangered.
vii. Before leaving the machine, the operator will lower the bucket to the ground.
viii. The operator will not leave his machine during the shift. Whenever, he finishes his work, he will hand over the machine to his relief or lock the excavator's cab.
ix. The operator will not allow any unauthorized person to ride on the machine.

Dumper: -

i. Every dumper will be provided with efficient brakes.
ii. Efficient audible warning devices will be provided with the dumpers.
iii. The dumper, if required to work after daylight hours, efficient headlights and taillights will be used.
iv. Every dumper will be under the charge of a competent person, authorized in writing by the manager.
v. No person, other than the driver or his helper, if any, will ride on a dumper.
vi. No person will be permitted to ride in the running board of a dumper.
vii. The loaded dumpers will not be reversed on gradients.
viii. Sufficient stop blocks will be provided at every tipping point, and these will be used on every occasion when material is dumped.
ix. Standard traffic rules shall be adopted and followed during movement of all dumpers. They shall be prominently displayed at relevant places in the opencast workings and haulm roads.
x. When not in use, every dumper will be moved to and stood on proper parking places.
xi. No person will be permitted to work on a chassis of a dumper, with the body in rest position, until after the dumper body has been securely blocked-in position.
xii. The mechanical wised mechanism will not be depended upon to whole the body of a dumper in a rest position.
xiii. No unauthorized person will be permitted to enter or remain in any turning points.
xiv. While inflating tyres, suitable protective cages shall be used.
xv. Tyres will never be inflated by sitting either in the front or on the top of the same.
xvi. While the vehicle is being loaded / unloaded on gradient, the same will be secured stationary by the parking brake, and other means suitably designed stopper block, which could be placed below the tyres.
xvii. At least once in every two weeks the brakes of every dumper will be tested as below: -
   (a) Service Brake test: The brake will be tested on a specified gradient and speed when the vehicle is fully loaded. The vehicle should stop within the specified distance when the brake is applied.
   (b) Parking brake test: The parking brake shall be capable to hold the vehicle when it is fully loaded and placed at the maximum gradient. Maximum gradient of the roadway which is permitted only for a period of at least 10 minutes.

(c) A record of such test will be maintained in a bound paged book and will be signed by the competent person carrying out the test. These records will be countered signed by the engineer and manager.

(d) All vehicles shall be tested and examined once at least in every 6 months.

(e) A notice shall be displayed outside every vehicle that **"No Unauthorized Travelling allowed"**.

Duties of dumper operators:

At the commencement of every shift, the operator shall personally inspect and test the machine, paying special attention to the following details: -

i. Tyre pressure, brakes, horn, and the Lights are in working order.
ii. The driver will neither take out the machine for work nor will he work the machine unless he is satisfied that it is mechanically shown and in efficient working order.
iii. The driver will maintain a record of every inspection made in a bound paged book, kept for the purpose, and shall sign every entry made their in.
iv. The driver will keep the cab window clean so to ensure clear vision at all times.
v. Driver will ensure that the gear is in neutral position before stopping the engine. He will park the vehicle: -
   (a) In reverse gear, on level roads and down gradients.
   (b) In low gear, on up gradients.
vi. The driver will negotiate downhill gradients in low gear, so that minimum of braking is required.
vii. The driver will not drive too fast, avoid distractions, and drive defensively.
viii. Before crossing a road / railway line he will reduce his speed looking both directions along the road or railway line and will proceed across the road or line only if it is safe to do so.
ix. The driver will not operate the dumper in reverse unless he has a clear view of the area behind the vehicle.
x. The driver will see that the vehicle is not overloaded.
xi. The material is not loaded in a dumper to project horizontally beyond the sides of its body.
xii. The driver will not allow any unauthorized person to ride on the vehicle.
xiii. When there is a poor visibility, the speed of a vehicle will be restricted in a manner that the braking distance is maintained shorter the distance of visibility.
xiv. The driver will not leave his machine during the shift. When he finishes his work, he will hand over the machine to his reliever or lock the excavator's cab.

2.5.2. Details of Production & Dispatches of Five Years

This is a new lease area allotted to the applicant. As it is a new mine. Preproduction activities are required. Roads from lease boundary to entry to the mining area, from mining faces to the proposed exit area, from ground level to the mining area, to the mine's office complex, plantation area, and to the garage / workshop & Access roads / haul roads are proposed to be developed.

The Future production programme has been planned as per the details given below:

RIVER SAND MINING WITH SIMULTANEOUS RECLAMATION

fully manual mining with simultaneous reclamation and pollution free mining method shall be adopted. River sand used for construction industry is available all along the river Yamuna in the plains of Haryana. Yamuna River flows along some major towns of Haryana from North to South

like Yamuna Nagar, Karnal, Panipat, Sonipat, Faridabad and Palwal. The sand is a minor mineral and falls under the preview of the Mines and Geology Department, State of Haryana.

The sand mines of Sultanpur Unit District Palwal are approachable from Highway No.-2 and are about 15 -18 Kms on the East side from the highway. The villages of Sultanpur and Atwa are well connected with mettle road network. The same will be used to take the mineral transported to various destinations.

MINE ROADS

All villages in the proposed lease area of Sultanpur Unit are connected by metal roads. The mine roads branching off the village roads, are well consolidated to prevent sinking of heavy truck wheels (IVA), the mine roads are at least 10 m wide to permit easy manoeuvrability of trucks, provide crossover's and changing points. To keep pollution off the mine, dust is proposed to be supressed by spraying roads with water at intervals of 3 hrs by using tractor/truck mounted water sprinklers. The water for this purpose is obtained from tube wells located nearby.

Table 2-5: Mining Area Details

S. No.	Name of Quarries	Area free from restrictions (Ha)	Per day production MT	Year wise production MT	Area needed for production in ha
1	Sultanpur Block	20.02	4000	10,80,000	20.00

Daily production proposed = 4,000 tons.

Production programme is 160 trips/ day @ 25 ton per trip.

Working days have been taken as 270 days per annum.

Projected Production per Year = 270 x 4,000 = 10,80,000 Tons.

Table 2-6: Five Years Proposed Production Details (MT/A)

Year	Trips/ day	MMTPA
I	160	1.080
II	160	1.080
III	160	1.080
IV	160	1.080
V	160	1.080

PHYSICAL & GEOGRAPHICAL CHARACTERISTIC OF THE DEPOSIT:

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

2.5.3. Extent of Mechanization

This is a new mining lease. Following equipment are proposed to be deployed for the desired production.

Table 2-7: List of Machinery

S. No.	Name of machinery	Capacity	Nos.	Engagement
1	Excavator cum loader	2.0 m^3	4	Hire Basis
2	Tippers/ Trucks	25 tons	36	Hire Basis
3	Water Tanker	4000 liters	2	Hire Basis
4	Light vehicles	--	1	-

Fuel Consumption: The diesel requirement for the mining operation will be 3680 Liter / day in peak production stage. The break-up of diesel consumption is given below.

Table 2-8: Fuel Consumption / Day

S. No.	Machine	Details of Diesel requirements	Consumption
1.	Dumper	(Considering diesel consumption by the dumper is 3 km / ltr.) Total Diesel consumption for 36 Dumper = 36x50 = 1800Ltr	1800 liter
2.	JCB	Diesel consumption 10ltr / hr working of 20 hrs diesel consumption = 20 x20x4 =1600 ltr	16000 liter
3.	Water Tankers	Diesel consumption 10 ltr/Hour x10 x 2=200	200 liter
4.	Light Vehicles	Diesel consumption 8 ltr/Hour x 10 x1=80 ltr	80 liter
		Total diesel requirements per day	**3680 liter**

2.5.4. Water Demand

The requirement of water for the project will be sourced from private water tankers. The total water demand will be 40.2 KLD which will conclude dust suppression (29.3 KLD), green belt development (7.9 KLD) & domestic requirement (3.0 KLD). Details are given in Table 1.2.

2.5.5. Electricity Requirement

Electrical supply is available in all nearby villages.

2.5.6. Mode of Transportation

Mineral Sand will be transported by hired trucks. Loaded trucks will travel on Kuccha Road made for plying of trucks. Temporary roads will provide access to the riverbed and the movement of loaded trucks. As the lease area

stretches in a length of around 1.50 km, working will be carried out in both villages' riverbed. Each village has its outlet meeting the tar road on the nearby villages and from where the mineral is sent to various destinations. Similarly, mineral will be transported on the other side through approach roads which finally merge with tar roads for final destinations.

2.5.7. Manpower Requirement

Statutory personnel as detailed below are proposed to be deployed by project proponent as per requirement of Mines Act-1952 and latest DGMS circulars. Manpower will be preferred from nearby region based on their skills. Total requirement of employee (skilled & unskilled) will be required 67 which may be sourced from nearest villages as per their skills.

Table 2-9: Manpower Requirement

S. No.	Category	Numbers
1	Manager – 1st Class	1
2	Assistant managers	2
3	Foreman/Mates	2
4	Supervisory staff	2
5	Skilled personnel	40
6	Semi-skilled personnel	10
7	Un-skilled personnel	10
	Total	67

2.6. Conceptual Development Plan

Mine lease area will be worked in blocks for ease of operation. However, as the digging depth will be restricted to 3.0 m only, material will still be available below. This will be further replenished during rainy season. Blocks will be worked systematically as the width is limited while length is much more.

- **Final Slope Angle to be Adopted**: Thickness of the bench is limited to 3.0 m only and width will be more than the height of the bench. Riverbank side will be protected by working in 3/4 part of middle of the river. 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 riverbed is varying from 2-3 m only.
- **Working**: During plan period workings will be carried out in both villages at a time in the lease area simultaneously. Scattered workings will ensure safety, remove congestion of vehicles, and will have better control and management.
- **Ultimate Capacity of Dumps**: There will be no OB removal and waste generation during the plan period. No dumping area is needed. No outside material will be filled up in the extracted zone.

2.6.1. Land-Use Pattern

Presently there is no pit available in the riverbed. The past 2-3 years floods/ monsoon waters have peneplanes the earlier worked riverbed. Earlier Sand from this area used to be transported from the road network ultimately to various destinations in the NCR. Land use pattern will be as follows:

Table 2-10: Land-Use Breakup at Present and Conceptual Stage

Particulars	Present	End of 5 Years
Pit Area	0.0	0.0
Dump Area	0.0	0.0
Restricted Area	0.0	5.04
Area for Ancillary Activities / Mineral Storage	8.35	8.35
Plantation (In safety zone* and ancillary area)	0.00	2.00*
Naturally reclaimed area	25.06	20.02
Total	**33.42**	**33.42**

Table 2-11: Detailed Lease Area Break-up

Areas	Atwa Village		Sultanpur Village		Total Area	
	Acres	Hectare	Acres	Hectare	Acres	Hectare
Lease Area	23.41	9.364	39.25	15.74	62.66	25.104
Ancillary Area	9.88	3.952	11	4.4	20.88	8.352

2.6.2. Drilling & Blasting

Sand extraction will not require any drilling, blasting activities. It will be directly loaded into trucks.

2.6.3. Mine Drainage

The river Yamuna flows from N to S which originates from the Himalayas provides the major drainage in the lease area. The general slope of the land surface is From N to S and elevation of

the lease area varies from 181.3 mRL in the north end side to 176.0 mRL in south end as detailed in Table 2.1.

There is no flow of water in the riverbed in post monsoon period. Area is having 542 mm rainfall in a year. During rainy season, catchment water flows in the river. During dry period the Sand is excavated which gets replenished during rainy period. No mining activities will be carried out during rainy season when there is water flowing in the working area.

There will be no intersection of water table as working will be carried out up to 3.0 m depth only from surface of riverbed while the water level is 5 -10 m below the surface of riverbed.

2.6.4. Environment Management Plan

General Measures:

- Envisaged mining operation will be carried out in the Riverbed. This will be dry bed mining. There will be no mining activities when there is flow of water in the working zones. During rainy season, the activities will be stopped, if there is flow in the river.
- Besides resource extraction, following activities will be kept in view:
  a. Protection and restoration of ecological system.
  b. Prevent damages to the river regime.
  c. Protect riverine configuration such as bank erosion, change of water course gradient, flow regime etc.
  d. Prevent contamination of ground water.

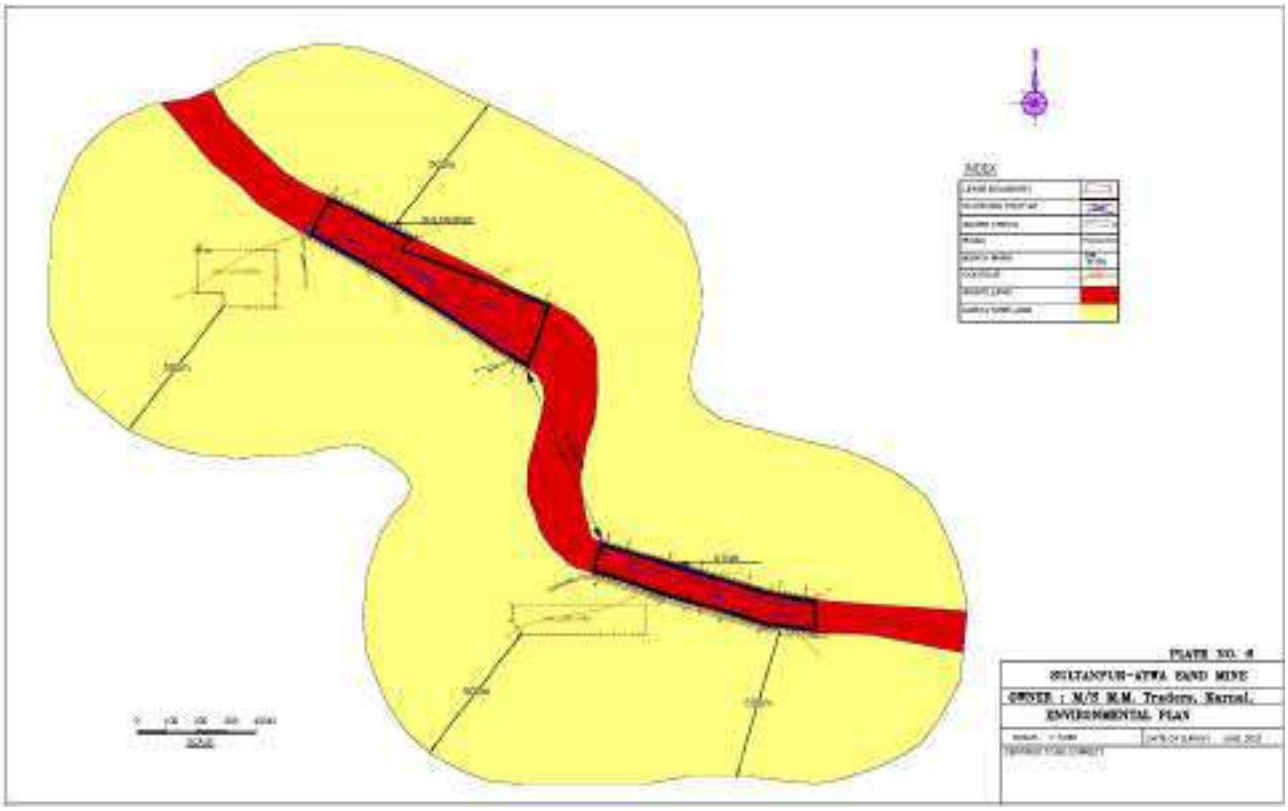
Safeguard Measures:

While carrying out mining activity following measures will be taken.

- Mining activities will be carried out only in dry bed. No in stream mining will be practiced.
- Identification of river stretches for mining will be completed.
- There will be no mining near the banks. This is to protect the bank erosion and river migration.
- Mineral Sand from river will be restricted to a maximum depth of 3.0 m from the existing bed level. This is for safety and sustainability.
- As the lease area is quite large and long in length, systematic extraction will be carried out to prevent seasonal scouring and enhanced erosion.
- Extraction will be carried out in a manner that there is no obstruction to flow of water, if any, during rainy season.
- Mining on the concave side of the river channel should be avoided to prevent bank erosion. Similarly meandering segment of river will be selected to prevent natural eroding banks and to promote mining on natural building (aggrading) meanders component.
- There is no generation of OB/ waste material. No backfilling has been proposed in the excavated zone. Riverbed will be replenished by sediments during rainy season.

Greenbelt: To restore the environment and ecological balance in the area affected by mining, a forestation is an effective measure. plantation is a major thrust area in pollution control of mining. plantation is suitable for detecting, recognizing, and reducing air pollution effects. Tree functions as sinks of air pollutants, besides their bio-aesthetical values, owing to its large surface area. The green belt supplements Oxygen to the atmosphere and combat air pollution effectively and aesthetic beauty and landscape of the area improves. It also checks soil erosion and make eco-system and climate more conducive.

Table 2-12: Environment Plan



Following factors will be considered while selecting species for plantation: -

- Fast growing plant species shall be preferred.
- The plant will be of deep rooting system.
- The plant will be perennially green to improve aesthetic beauty of the area.
- The plant species will be adoptable to the local climatic conditions.
- Native plant species will be planted.

2.7. Progressive Mine Closure Plan

2.7.1. Mined-Out Land

About 20.02-hectare area is available for mining. Land use at various stages is given in table 2.10.

2.7.2. Water quality management

Mining is being proposed in the riverbed in the river Yamuna. The general water table in the area is 5-10 m. There are no surface or ground water bodies within the lease area except the running water in river Yamuna the quantum of which varies throughout the year depending on rains and release of water from dams upstream.

There is a little flow of water in the riverbed in post monsoon period. Area is having 542 mm rainfall in a year. During rainy season, catchment water flows in the river. During dry period the Sand is excavated which gets replenished to some extent during this period. No mining activities will be carried out during rainy season when there is flooding in the working area.

There will be no intersection of water table as working will be carried out up to 3.0 m depth only from surface of riverbed while the water level is 5-10 m below the surface of riverbed.

2.7.3. Air Quality Management

The proposed mining method is not likely to produce much of dust and fugitive emissions to cause damage to ambient air quality of the area. Workers will be provided with personnel protective equipment like face mask, ear plug/ muffs.

For air pollution management at the progressive mine closure of mine, green belt will be developed to prevent and control air pollution.

2.7.4. Waste Management

As stated in mining method, there will be no OB/ waste generation and there will not be any OB/ waste dumps.

2.7.5. Topsoil Management

There is no topsoil.

2.7.6. Tailing dam management

There is no proposal of beneficiation of mineral. No tailing dam is envisaged.

2.7.7. Infrastructure

The infrastructure facilities like site office, first –aid station, rest shelter/ store, drinking water etc. will be established.

2.7.8. Disposal of mining machinery

Machinery is proposed on hire basis. Hence no decommissioning of mining machinery is proposed.

2.7.9. Safety & Security

Safety measures will be implemented to prevent access to excavation area by un-authorized persons as per Mine Act 1952, MMR 1961.

a) Safety measures will be implemented as per Mine Act 1952, MMR 1961, Mines Rules 1955.
b) Provisions of MMR1961 shall be followed strictly and all roads shall be 10 m wide and have a gradient of not more than 1 in 20.
c) Excavation will be not more than 3 m depth.
d) Width of bench will be kept around 20.0 m for ease of operations and provide sufficient room for the movement of equipment.
e) Protective equipment like dust masks, ear plugs/ muffs and other equipment shall be provided for use by the work persons.
f) Notices giving warning to prevent inadvertent entry of persons shall be displayed at all conspicuous places and near mining entries.
g) Danger signs shall be displayed near the excavations.
h) Security guards will be posted.
i) In the event of temporary closer, approaches will be fenced off and notice displayed.

2.7.10. Disaster Management and Risk Assessment

This should deal with action plan for high-risk accidents like landslides, subsidence, flood, inundation in underground mines, fire, seismic activities, tailing dam failures etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The capability of

lessee to meet such eventualities and the assistance to be required from the local authorities should be described.

- The shallow depth of activities in riverbed mining will not involve any high-risk accident due to side falls/collapse.
- The complete mining operation will be carried out under the Management and control of experienced and qualified Mines Manager having Certificate of Competency to manage the mines granted by DGMS.
- All the provisions of Mines Act 1952, MMR 1961, and Mines Rules 1955, RMMCR 1986 and other laws applicable to mine will strictly be complied with.
- During heavy rainfall the mining activities will be closed.
- All persons in supervisory capacity will be provided with proper communication facilities.
- Competent persons will be provided FIRST AID kits which they will always carry.

2.7.11. Care and Maintenance during Temporary Discontinuance

In case of any temporary discontinuance due to court order or due to statutory requirement or any other unforeseen circumstance following measures shall be taken for care, maintenance, and monitoring of conditions.

- Notice of temporary discontinuance of work in mine shall be given to the DGMS as per the MMR 1961.
- All the mining machinery shall be shifted to a safe place.
- Entrance to the mine or part of the mine, to be discontinued shall be fenced off. Fencing shall be as per the circular 11/1959 from DGMS.
- Security Guards shall be posted for the safety and to prevent any unauthorized entry to the area.
- Carry out regular maintenance of the facilities/area detailed below in such a way as would have been done as if the mines were operation:
- Mine roads and approach roads,
- Fencing on approach roads,
- Checking and maintenance of machines and equipment,
- Drinking water arrangements,
- Mine office, first aid stations etc.
- Competent persons shall inspect the area regularly.
- Air, water, and other environmental monitoring shall be carried out as per CPCB and IBM Guideline.
- Care and upkeep of plantation shall be carried out on regular basis.
- Status of the working and status monitoring for re-opening of the mines shall be discussed daily.
- In case of discontinuance due to any natural calamities/abnormal conditions, mining operation will be restarted as early as possible after completing rescue work, restoring safety and security, repairs of roads etc.

2.8. Summary

The total proposed production is 10,80,000 MTPA of mineral sand from riverbed of Yamuna over in area of 20.02 ha mining area excluding ancillary area (Total 33.42 Ha). This mining project will

provide employment to 67 people which will include skilled and unskilled labours and indirect employment will also be created due to this project. A suitable combination of trees that can grow fast and have good leaf cover to contain dust pollution shall be adopted to develop greenbelt. Greenbelt development will be done wherever possible. Plantation (Total 7,900 Saplings) will be done within first 2 years and in later years maintenance will be ensured. The project proponent will also play an important role in the development and improvement of the infrastructure of that region which will help in improving the standard of living of that region.

CHAPTER – 03

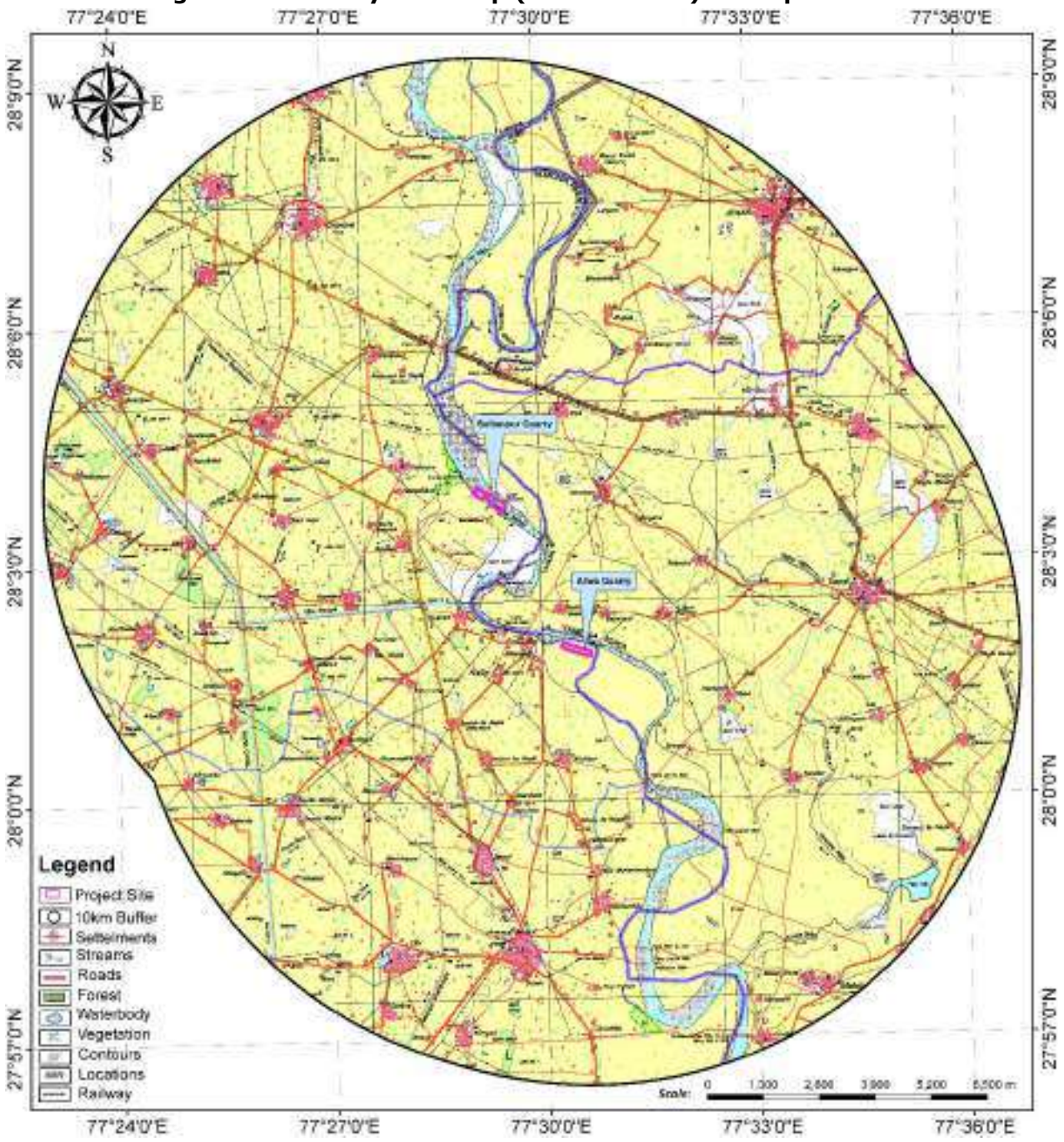
DESCRIPTION OF ENVIRONMENT

3. Description of Environment

3.1. Introduction

Baseline environmental status in and around enhanced project depicts the existing environmental conditions of air, noise, water, soil, biological and socio-economic environment. A radial distance of 10 km is considered as "study area" for baseline data collection and environmental monitoring. Baseline data was collected for various environmental attributes to compute the impacts that are likely to arise due to proposed development activity.

Figure 3.1: Study Area Map (10 km Buffer) of Proposed Site



3.2. Study Area & Period

According to Appendix III of EIA Notification, 2006 and its amendment till date, study area was selected from 10.0 km radius from the project boundary. The area was selected to do the studies and collect the baseline data as ambient air, water, soil, noise, meteorology, hydrogeology, hydrology, land-use, ecological and socio-economic data etc. The relevant information and data (both primary and secondary) were collected in core as well as buffer zone of 10 km from the project boundary during post-monsoon season (October 2022 to December 2022) in accordance with the guidelines for preparation of EIA.

3.2.1. Methodologies Adopted

The baseline data for environmental parameters were collected as per standard Terms of Reference for the relevant category of the project. The data was also authenticated or validated from the secondary data collected from regarding departments of agencies. The detailed methodology is as given below.

3.2.2. Primary Data Collection Methodologies

A detailed field monitoring study of the project study area was carried out for baseline environment assessment of the project area. Baseline data was generated for various environmental parameters including air, water (surface and groundwater), land and soil, ecology, and socio-economic status to determine quality of the prevailing environmental settings. Sampling of soil and water, monitoring of air quality and noise level and other field data collection were carried out by the team operating from this field station. The field team consisted of technical personnel viz. environmental scientists and social experts along with the field staff.

The noteworthy activities completed during the field visit were as follows:

- ✓ A meteorological station was setup on the roof top a house in nearby village from proposed mining lease. Wind speed, wind direction, dry and wet bulb temperature, relative humidity, and general weather conditions were recorded throughout the study period in an automated data logger.
- ✓ To assess the Ambient Air Quality (AAQ), samples of ambient air were collected by installation of Respirable Dust Sampler and Fine Particulate Sampler at different locations from the study area during study period and analysed for primary air pollutants to work out the existing status of air quality.
- ✓ Groundwater samples were collected during the study period from the existing hand-pumps and bore wells, while surface water was collected from nearest pond, rivers, and lakes. The samples were analysed for parameters necessary to determine water quality (based on IS: 10500: 2012, IS 3025 and APHA 23rd Edition, 2017 for ground water, water quality criteria classified by CPCB for surface water) and those which are relevant from the point of view of environmental impact of the proposed site.
- ✓ Soil samples were collected and analysed for relevant physical and chemical characteristics to assess the impact of the proposed plant on soil.
- ✓ The noise level measurements were also made at two locations in different intervals of time with the help of sound level meter to establish the baseline noise levels in the impact zone.

- ✓ Ecological data was procured from both primary and secondary sources. A primary data was collected through survey and walkover by ecological experts.
- ✓ Socio-economic data was collected from field studies and secondary sources like Census of India 2011 etc.

3.2.3. Secondary Data Collection

Secondary data are those collected over the years that can be used to understand the existing environmental scenario of the study area. The secondary data is required to authenticate the primary data as the primary data was collected over the short period which should be comparing to know the trend of baseline data to compete the understanding of baseline scenario.

Table 3-1: Detailed of Secondary Data Collection

S. No.	Area	Description	Source
1.	Meteorology	Temperature, humidity, rainfall, wind speed, Wind Direction	IMD Station Gurugram (1981-2010).
2.	Ambient Air	Air Pollutants	CPCB.
3.	Water Quality	Water (Surface & Ground) Characteristics	
4.	Soil Quality	Soil characteristics	
5.	Nature of terrain	Land-use	Survey of India (Toposheet), National Remote Sensing Centre (Satellite image).
6.	Hydrogeology	Geological formation, hydro-geological analysis	District Ground Water Information Booklet, Palwal District, Haryana.
7.	Seismic Data	Seismic zone	Seismicity Map.
8.	Biological Environment	Inventory of flora & fauna	District Forest Department.
9.	Socio-economic status	Demographic profile, household, occupation status.	Census data (2001 & 2011).

Source: Studies done by PARIVESH ENVIRONMENTAL ENGINEERING SERVICES

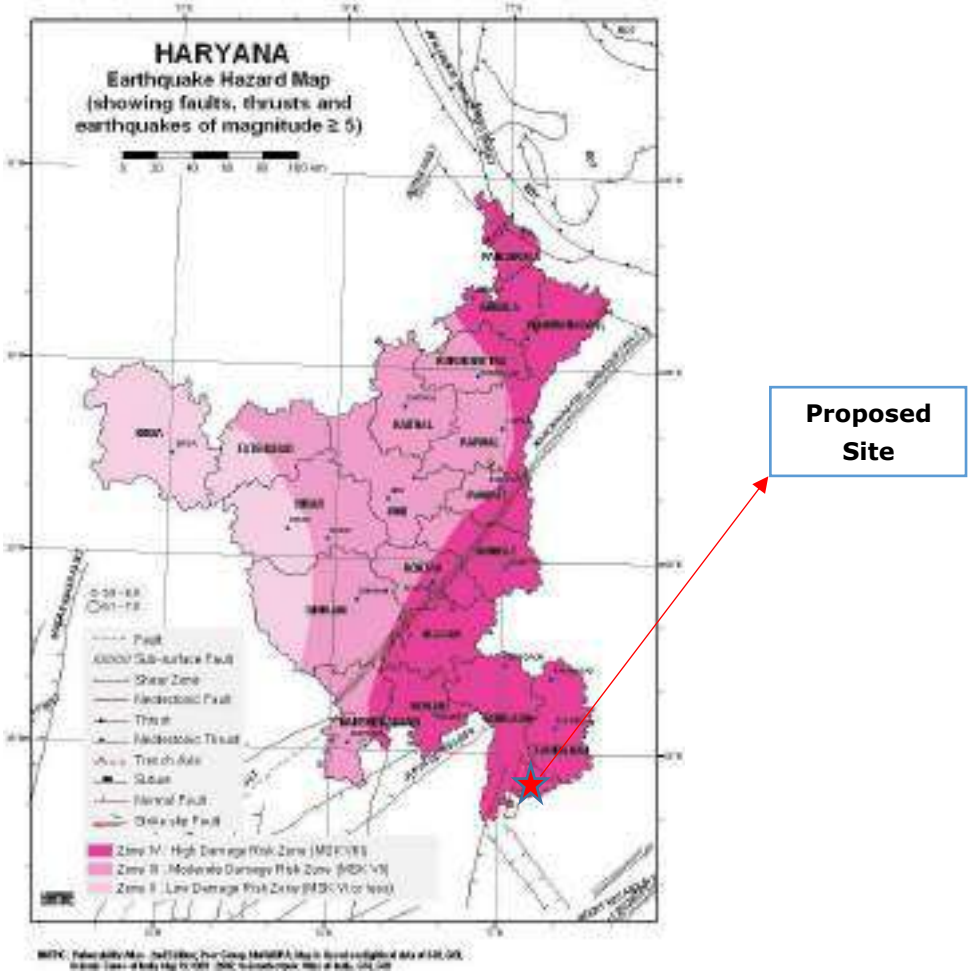
3.3. Physical Environment

3.3.1. Seismic Status of Study Area

The area which has struck by the present event has been described as a region of Seismic Zone-IV which is defined as high damage risk zone (MSK intensity< VIII) in the Seismic Map of Haryana. Adequate measures need to be adopted during operation phase of the project-by-project proponent.

Seismic Hazard of Haryana: The seismic zoning map of Haryana is shown in Figure 4.2. Ambala, Sonipat, Rohtak, Karnal, Gurgaon, Faridabad, Panipat, Rewari and Yamuna Nagar districts lie in Zone IV. The districts of Kurukshetra, Jind, Hissar, Bhiwani, Mahendra Garh and Kaithal lie in Zone III while only Sirsa district lies in Zone II. The entire state of Delhi lies in Zone IV and so does the Union Territory of Chandigarh. Since the earthquake database in India is still incomplete, especially with regards to earthquakes prior to the historical period (before 1800 A.D.), these zones offer a rough guide of the earthquake hazard in any region and need to be regularly updated.

Figure 3.2: Earthquake Hazard Map of Haryana



Earthquake History of Haryana State

Eastern parts of Haryana along with Delhi lie in the Gangetic Plain. This is a fore-deep, a downward of the Himalayan foreland, of variable depth, converted into flat plains by long-vigorous sedimentation. This is known as a geosyncline and the Gangetic Plain is the Indo-Gangetic Geosyncline. This has shown considerable amounts of flexure and dislocation at the northern end and is bounded on the north by the Himalayan Frontal Thrust. The floor of the Gangetic trough (if see without all the sediments) is not an even plain but shows corrugated inequalities and buried ridges (shelf faults). The region sits atop the Delhi-Haridwar ridge, which is a sub-surface ridge, trending NE-SW. There are numerous faults in this region, like the Moradabad, Panipat and Sohna faults. Delhi, Chandigarh, and many parts of Haryana lie in Zone IV and thus they are extremely vulnerable to earthquakes. Most earthquakes in this region are shallow though a few earthquakes of intermediate depth have been recorded in Haryana. The alluvial cover of the Indo-Gangetic plain makes even distant earthquake felt here quite strongly. This region often feels deep-seated earthquakes that are centred on the Pakistan-Afghanistan Border and in the Hindukush mountains in Afghanistan. However, it must be stated that proximity to faults does not necessarily translate into a higher hazard as compared to areas located further away, as damage from earthquakes depends on numerous factors such as subsurface geology as well as adherence to the building codes.

3.3.2. Land-Use Details

The objective of assessing the land use details of the area is to know the existing land use pattern of the area and to know about the land that can be used for the proposed development activities in the study area. It also enables to envisage the scenario emerging due to the increase in demand for land with increase in population and the impacts arising due to the interface with various project activities.

Methodology: The land use / land cover map is prepared by adopting the interpretation techniques of the satellite image in combination with collateral data such as Survey of India topographical maps and census records. Image classification has been done by using visual interpretation techniques and digital classification using the image processing software's. The various activities for preparation of Land-use (LU)/ Land cover (LC) include pre-processing, rectification, enhancements and classifying the satellite data for assessing the change in LU/LC due to proposed developmental activities. The imagery is interpreted, and ground verification was done for corrections. The final map is prepared after ground truthing of the study area. The different land use/land cover categories in the study area have been carried out based on the NRSC land use / land cover classification system.

Interpretation Technique: Standard on-screen visual interpretation procedure was followed. The various Land use / Land cover classes interpreted along with the Survey of India topographical maps during the initial rapid reconnaissance of the study area. The physiognomic expressions conceived by image elements of Colour, tone, texture, size, shape, pattern, shadow, location, and associated features are used to interpret the FCC imagery. Image interpretation keys were developed for each of the LU/LC classes in terms of image elements.

FCC imagery (Digital data) was used for interpretation for the relevant land use classes. On screen visual interpretation coupled with supervised image classification techniques are used to prepare the land use classification.

- ✓ Digitization of the study area (10 km radius from the plant site) from the Survey of India Toposheet maps.
- ✓ Satellite Data Selection: In the present study the Landsat satellite image with Toposheet no. 43X8, H43X12, G43F5 & G43F9 have been procured and interpreted using the ERDAS imaging software adopting the necessary interpretation techniques.
- ✓ Satellite data interpretation and vectorization of the resulting units.
- ✓ Field checking and ground truth validation.
- ✓ Composition of final LU/LC map.

3.3.2.1. Land-use of the Study Area

Study area is mainly covering agricultural land (88.94%) by following built-up area (5.41%) & open scrub (3.55%) of the total study area.

Table 3-2: Land-use Classification of the Study Area

Land use Classification	Area in Hectare	Area in %
Built-up	2240.30	5.41
Agriculture Land	36857.24	88.94
River	549.88	1.33
Waterbody	82.44	0.20
Waterbody Dry	92.37	0.22

Land use Classification	Area in Hectare	Area in %
Open Scrub	1472.32	3.55
Sandy Area	108.17	0.26
Forest	36.29	0.09
Total	**32231.00**	**100.00**

Source: SOI Toposheet No. 43X8, H43X12, G43F5 & G43F9.

Figure 3.3: Land-Use Map of Study Area (10 km Buffer)

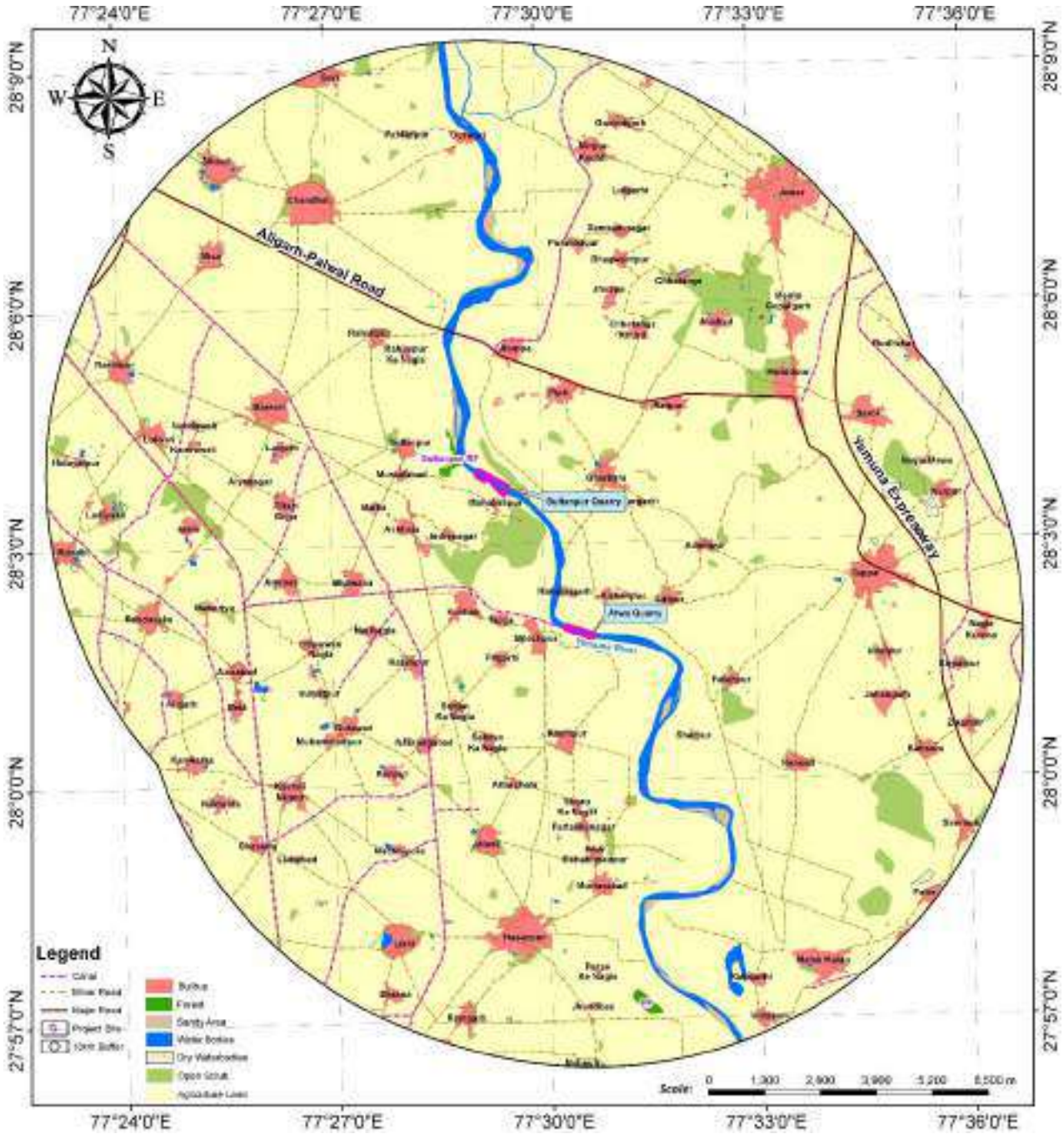
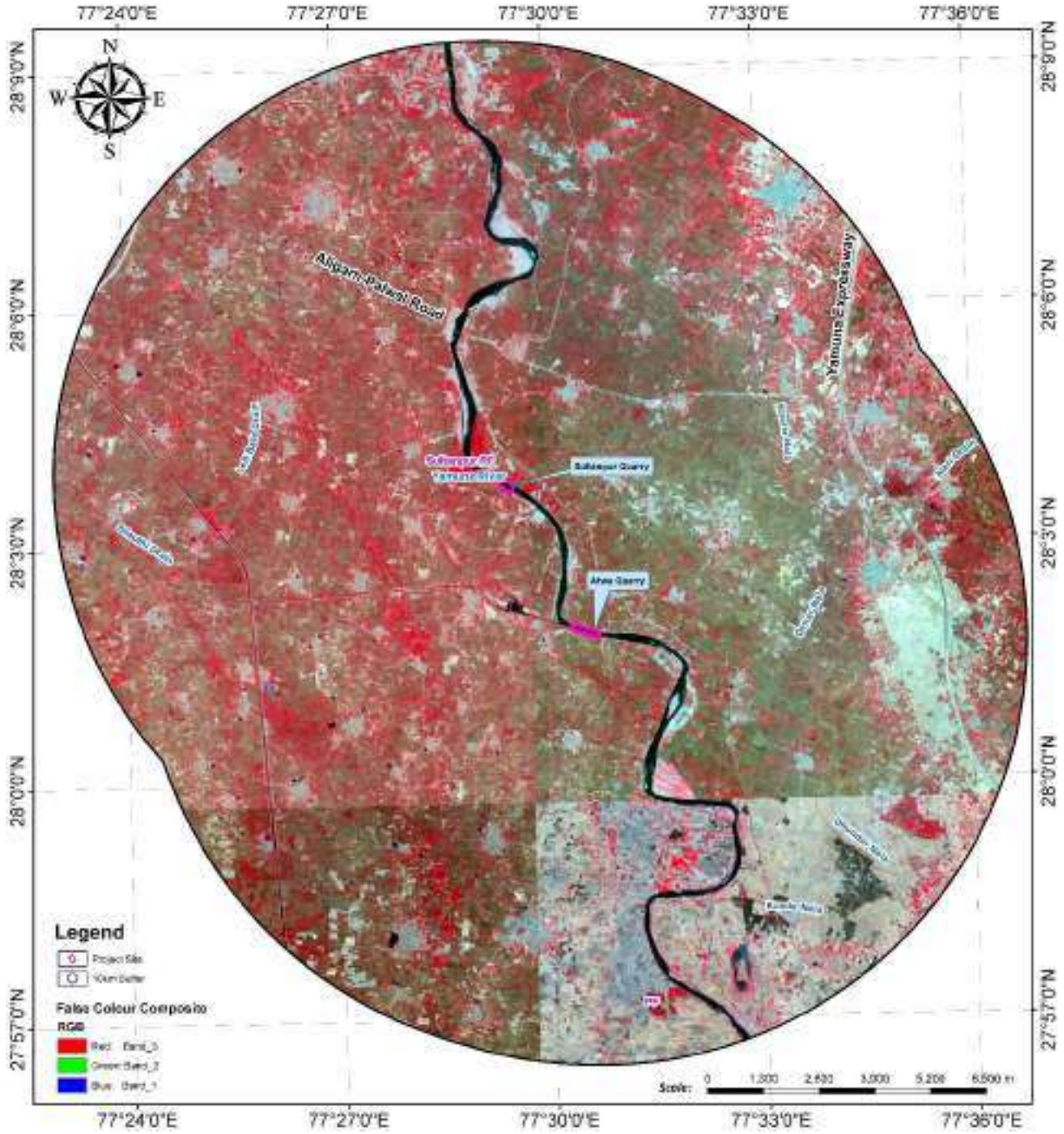


Figure 3.4: FCC Imagery of Study Area (10 km Buffer)



3.3.2.2. Land-use of the Project Area

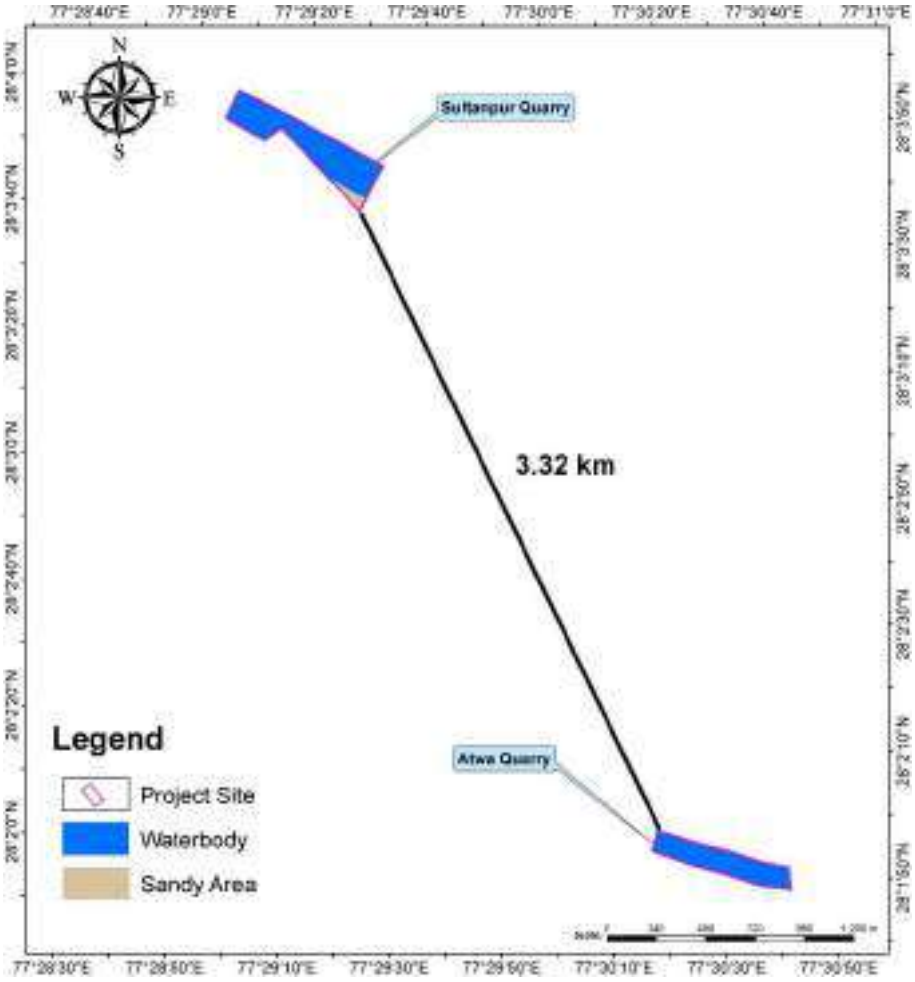
The proposed project site area is in river Yamuna as this is sand mining project from riverbed. Area land-use is detailed below.

Table 3-3: Land-use Classification of the Project Site

Land-Use Classification	Area in Hectare	Area in %
Sandy Area	4.64	18.49
River	20.46	81.51
Total	**25.10**	**100.00**

Source: SOI Toposheet No. 43X8.

Figure 3.5: Land-Use Map of Project Site



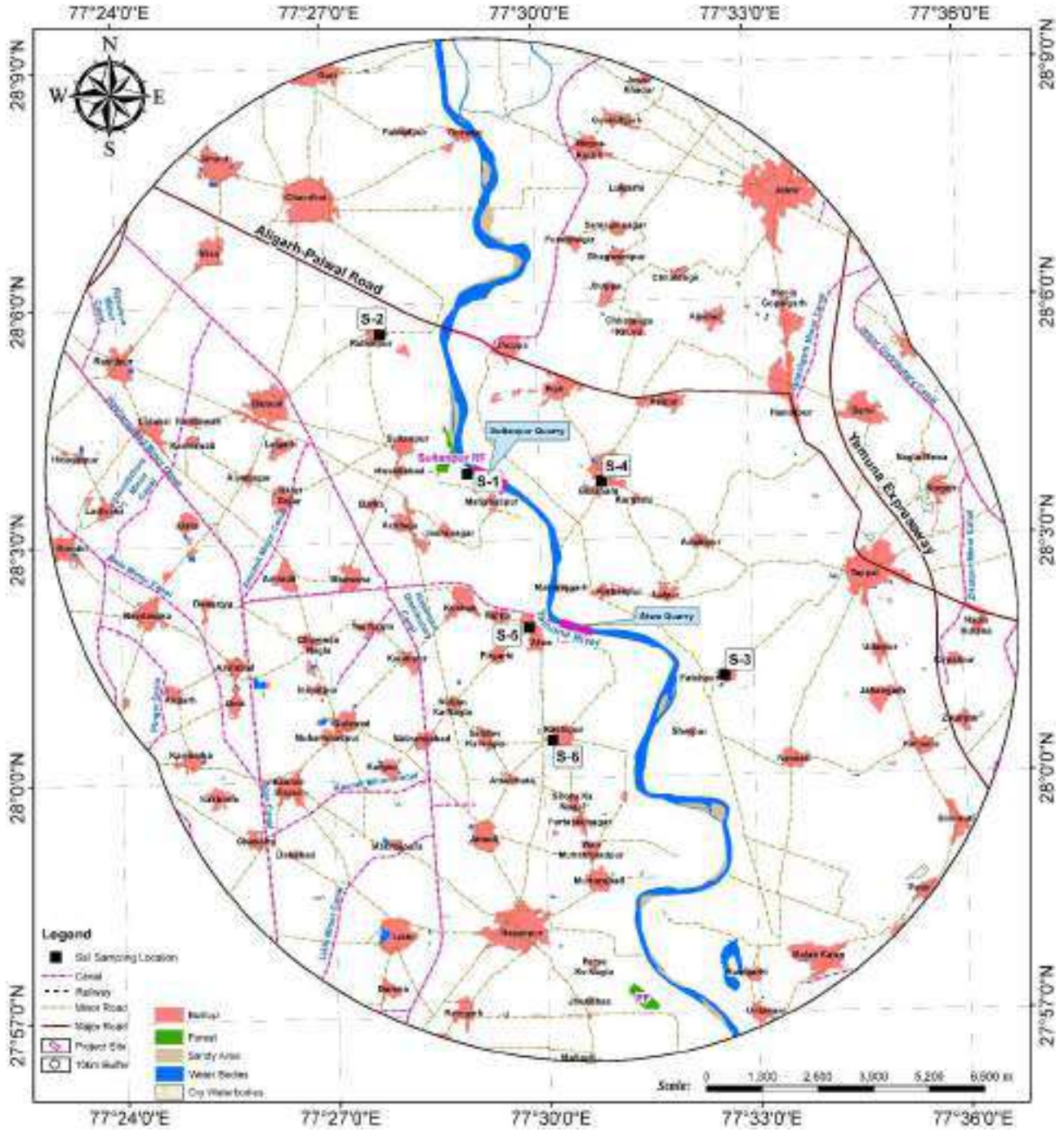
3.3.3. Soil Environment

To assess the baseline status of soil quality in the study area for tree plantation, filtration/ percolation of water, ground water scenario etc. total 6 soil samples were collected. The samples were collected by ramming an augur into the soil up to 30-cm depth. The sealed samples were sent to laboratory for analysis. Soil samples were analysed as per the standard methods prescribed in "Soil Chemical Analysis" (M.L. Jackson, 1967). The soil quality as analysed from the collected samples is given in Table 3.4 and the locations are shown in Figure 3.6.

Table 3-4: Soil Sampling Locations

S. No.	Location Name	Location Code	Distance (km)	Direction	Co-ordinates	
					Latitude	Longitude
1	Mahabalipur	S-1	0.27	NW	28° 3'51.14"N	77°28'58.32"E
2	Rahimpur	S-2	3.81	WNW	28° 5'38.19"N	77°27'46.29"E
3	Fatehpur	S-3	3.27	ESE	28° 1'15.22"N	77°32'35.38"E
4	Gharbara	S-4	2.23	ESE	28° 3'43.49"N	77°30'53.38"E
5	Bilochpur	S-5	0.76	W	28° 1'53.85"N	77°29'48.83"E
6	Kashipur	S-6	2.63	SSW	28° 0'28.30"N	77°30'7.44"E

Figure 3.6: Soil Sampling Locations



The samples were analysed as per the standard methods prescribed in Department of Agriculture & Cooperation Ministry of Agriculture; Government of India" & IS 2720. The important properties analysed for soil are bulk density, porosity, infiltration rate, pH, and organic matter, kjehldal Nitrogen, Phosphorous and Potassium. The standard classification of soil and physico-chemical characteristics of the soils is presented below in Table 3.5.

Table 3-5: Soil Classification Standards as per ICAR

Soil Test	Classification	
pH	<4.5 Extremely acidic 4.51- 5.50 Very strongly acidic	7.31-7.80 slightly alkaline 7.81-8.50 moderately alkaline

Soil Test	Classification	
	5.51-6.0 moderately acidic 6.01-6.50 slightly acidic 6.51-7.30 Neutral	8.51-9.0 strongly alkaline 9.01 very strongly alkaline
Salinity Electrical Conductivity (mmhos/cm) (1 ppm = 640 mmhos/cm)	Upto 1.00 Average 1.01-2.00 harmful to germination	2.01-3.00 harmful to crops (sensitive to salts)
Organic Carbon	Upto 0.2: very less 0.21-0.4: less 0.41-0.5 medium,	0.51-0.8: on an average sufficient 0.81-1.00: sufficient >1.0 more than sufficient
Nitrogen (Kg/ha)	Upto 50 very less 51-100 less 101-150 good	151-300 Better >300 sufficient
Phosphorus (Kg/ha)	Upto 15 very less 16-30 less 31-50 medium,	51-65 on an average sufficient 66-80 sufficient >80 more than sufficient
Potash (Kg/ha)	0 -120 very less 120-180 less 181-240 medium	241-300 average 301-360 better >360 more than sufficient

Source: Handbook of Agriculture, Indian Council of Agriculture Research, New Delhi

Table 3-6: Soil Quality Results

Parameters	Unit	S-1	S-2	S-3	S-4	S-5	S-6
pH	----	7.2	7.9	7.2	7.8	7.6	8.0
Electrical Conductivity	µmhos /cm	319	418	358	392	367	404
Moisture	%	24.5	23.9	25.4	26.3	24.8	27.1
Soil texture	USDA System	Loam	Loam	Loam	Loam	Sandy Clay Loam	Silty Loam
Sand	%	43	52	48	46	51	45
Silt	%	40	27	28	33	25	34
Clay	%	17	21	24	21	24	21
Infiltration Rate	cm/hr	1.36	1.45	1.23	1.69	1.35	1.48
Bulk density	gm/cm^3	1.58	1.56	1.57	1.56	1.56	1.56
Porosity	%	43.2	44.0	43.6	44.0	44.2	44.4
Iron (DTPA Extractable)	mg/kg	0.59	0.64	0.51	0.74	1.99	1.76
Zinc (DTPA Extractable)	mg/kg	1.68	1.52	1.49	1.61	2.34	2.15
Copper (DTPA Extractable)	mg/kg	0.95	0.99	1.02	0.84	0.91	0.87
Sodium as Na	mg/kg	23.9	22.9	25.4	22.9	26.2	24.1
Calcium as Ca	mg/kg	2174	1985	2245	2781	2167	1988
Magnesium as Mg	mg/kg	138	198	211	178	198	221
SAR Value	USDA System	0.99	0.98	1.03	0.84	1.08	1.03
Nitrogen as N	kg/ha as N	138	149	154	178	159	193
Phosphorus	kg/ha as P	15	21	17	19	16	17.6

Parameters	Unit	S-1	S-2	S-3	S-4	S-5	S-6
Potassium as K	kg/ha as K	109	124	119	112	114	115
Organic Carbon	%	0.32	0.51	0.30	0.44	0.40	0.40
Organic matter	%	0.55	0.87	0.52	0.75	0.69	0.69

SQ-Soil Sampling Locations

Results Interpretation: The soil was predominantly Loamy in the study area. The pH was ranges 7.2 to 8.0 which were neutral to slightly alkaline mostly as per ICAR guideline. The conductivity was varying from 319 µmhos/cm to 418 µmhos/cm in the study area which is average as per ICAR guidelines which is good to crops. Organic Carbon was varying from 0.3% to 0.51% which is between less & medium as per ICAR guidelines as mostly locations are near to river. Nitrogen was varying from 138 kg/ha to 193 kg/ha which is between good & better as per ICAR guidelines and good to crops. Phosphorous was varying from 15 kg/ha to 21 kg/ha which is between very less as per ICAR guidelines for crops. Potassium was varying from 109 kg/ha to 124 kg/ha which is also less as per ICAR guidelines. Heavy metals were also analysed. Overall, the soil quality was good having the good bulk density & good moisture content which may be due to the basin of river Yamuna.

3.4. Water Environment

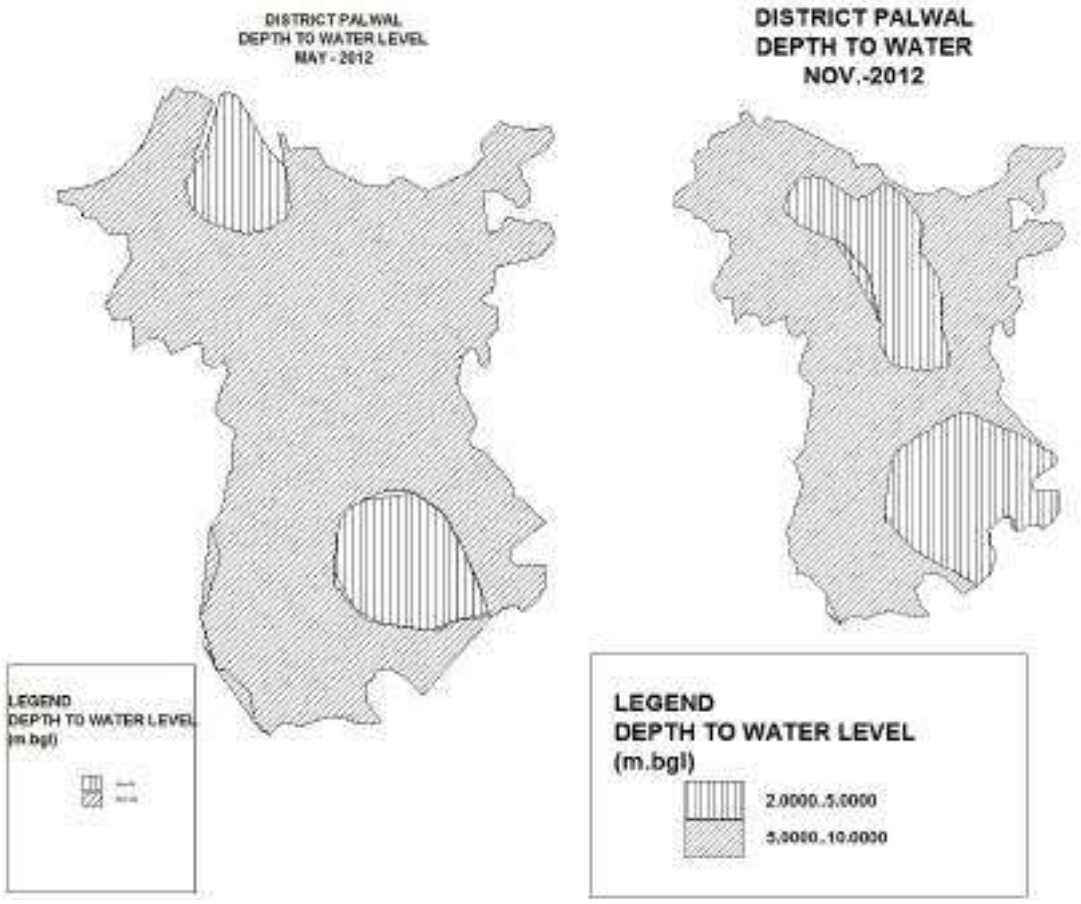
3.4.1. Hydrogeology (Aquifer System)

The district is occupied by Indo-Gangetic alluvial plain of Quaternary age and falls in Yamuna sub -basin of Ganga basin. The Central Ground Water Board has drilled 21 exploratory boreholes to delineate and determine potential aquifer zones, evaluation of aquifer characteristics Out of 21 exploratory boreholes 13 boreholes were abandoned due to poor quality of ground water. The permeable granular zones comprising fine to medium grained sand and occasionally coarse sand and gravel. Their lateral and as well as vertical extent is limited. The borehole data reveals that clay group of formations dominate over the sand group in the district area. Ground water occurs in alluvium and the underlying weathered/ fractured quartzites. Alluvium comprises sands silt, Kankar and gravel. Which form the principal ground water bearing horizon. In Quartzite formation, occupying the north- western part of the district, ground water occurs in weathered and jointed fractured horizons. Weathering and fracturing have resulted in formation of semi-consolidated sand bads (BADARPUR SANDS) which form potential aquifer zones. This quartzite formation has not been explored for ground water occurrence. In alluvium, granular zones are evenly distributed in entire thickness which is negligible near the quartzite outcrops to over 350 m in the eastern parts near Yamuna River. The discharge of the well's ranges from 750 lpm to 900 lpm at a drawdown of 5.5 to 7.00m. The transmissivity 'T' value ranges between 55 to 200 m^2 /day were determined. Shallow tube wells for irrigation use are generally constructed up to a depth of 40 m. The discharge of these shallow tube wells range 360 - 600 litres per minutes.

3.4.2. Trend / Behaviour to Ground Water Level

The depth to water level ranges from 2.00 m bgl to 10.75 m bgl during pre-monsoon period, and 2 m. bgl to 9.40 m. bgl. during post monsoon period. The water level trend during pre-monsoon period indicates average fall of 0.20m/year. The long-term water level trend is showing small decline and other places rise in district.

Figure 3.7: Pre-Monsoon (May 2012) & Post-Monsoon (November 2012) Water Level



Source: http://cgwb.gov.in/District_Profile/Haryana/Palwal.pdf;

3.4.3. Status of Ground Water Development

The hydrogeological data generated through exploratory drilling has proved a vital information regarding identification of aquifer system, demarcation of their vertical and lateral extent, and delineation of potential aquifer characteristics. These studies also provide information on well design and drilling techniques. A well assembly of 203 mm dia, using about 20 m to 30 m long housing pipe and MS slot pipe with slots of 1.19 mm to 1.59 mm size would be ideal in the district area. "V" wires galvanized Screen having 0.50-1.5 mm slot can also be used as it can provide more open area conventional slotted pipes. Entrance velocity of water in the well must be kept in mind while designing the well assembly. Reverse /Direct circulation rig is suitable for carrying out the drilling in alluvial parts of district whereas percussion or Down the Hole Hammer (DTH) technique with Odex attachment are suitable for drilling in boulder formation.

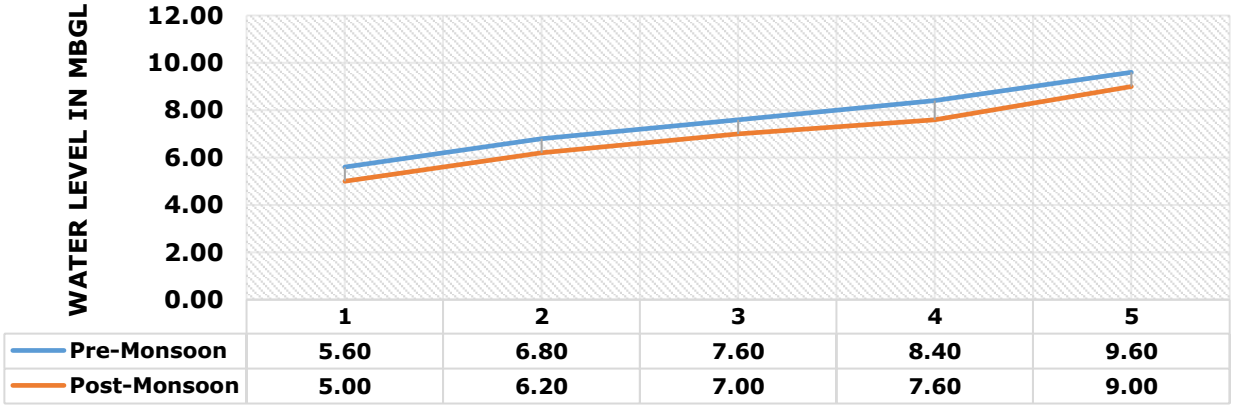
3.4.4. Water Level Fluctuation in Study Area

To assess the ground water scenario, 5 samples were collected from dug wells. Sampling locations with co-ordinates are given below in Table 3.7. The water level fluctuation in ground water was varying from 5.6 MBGL to 9.6 MBGL in pre-monsoon and 5.0 MBGL to 9.0 MBGL in post-monsoon season. Ground water fluctuation difference was observed from 0.6 MBGL to 0.8 MBGL in the study area.

Table 3-7: Ground Water Level Fluctuation in Area

Location	Latitude	Longitude	Pre-Monsoon	Post-Monsoon
WL – 1	28°01'53.85"N	77°29'48.83"E	5.60	5.00
WL – 2	28°00'27.47"N	77°30'09.12"E	6.80	6.20
WL – 3	28°04'09.39"N	77°28'08.35"E	7.60	7.00
WL – 4	28°05'38.40"N	77°27'46.27"E	8.40	7.60
WL – 5	28°03'39.10"N	77°30'50.38"E	9.60	9.00

Figure 3.8: Water Level Fluctuation of Pre-monsoon and Post-monsoon



3.4.5. Rainfall & Climate

The climate of Palwal district can be classified as tropical steppe, semiarid and hot which is mainly characterized by the extreme dryness of the Air except during monsoon months. During three months of southwest monsoon from last week of June to September, the moist air of oceanic penetrate the district and causes high humidity, cloudiness, and monsoon rainfall. The period from October to December constitutes post monsoon season. The cold weather season prevails from January to the beginning of March and followed by the hot weather or summer season which prevails up to the last week of June.

The normal annual rainfall in Palwal district is about 542 mm spread over 27 days. The southwest monsoon sets in the last week of June and withdraws towards the end of September and contributes about 85% of the annual rainfall. July and August are the wettest months 15% of the annual rainfall occurs during the non-monsoon months in the wake of thunderstorms and western disturbances. Normal Annual Rainfall - 542 mm, Normal Monsoon Rainfall - 460 mm, Temperature - 41^0 C (May & June).

3.4.6. Ground Water Quality

3.4.6.1. Methodology for Sampling & Analysis

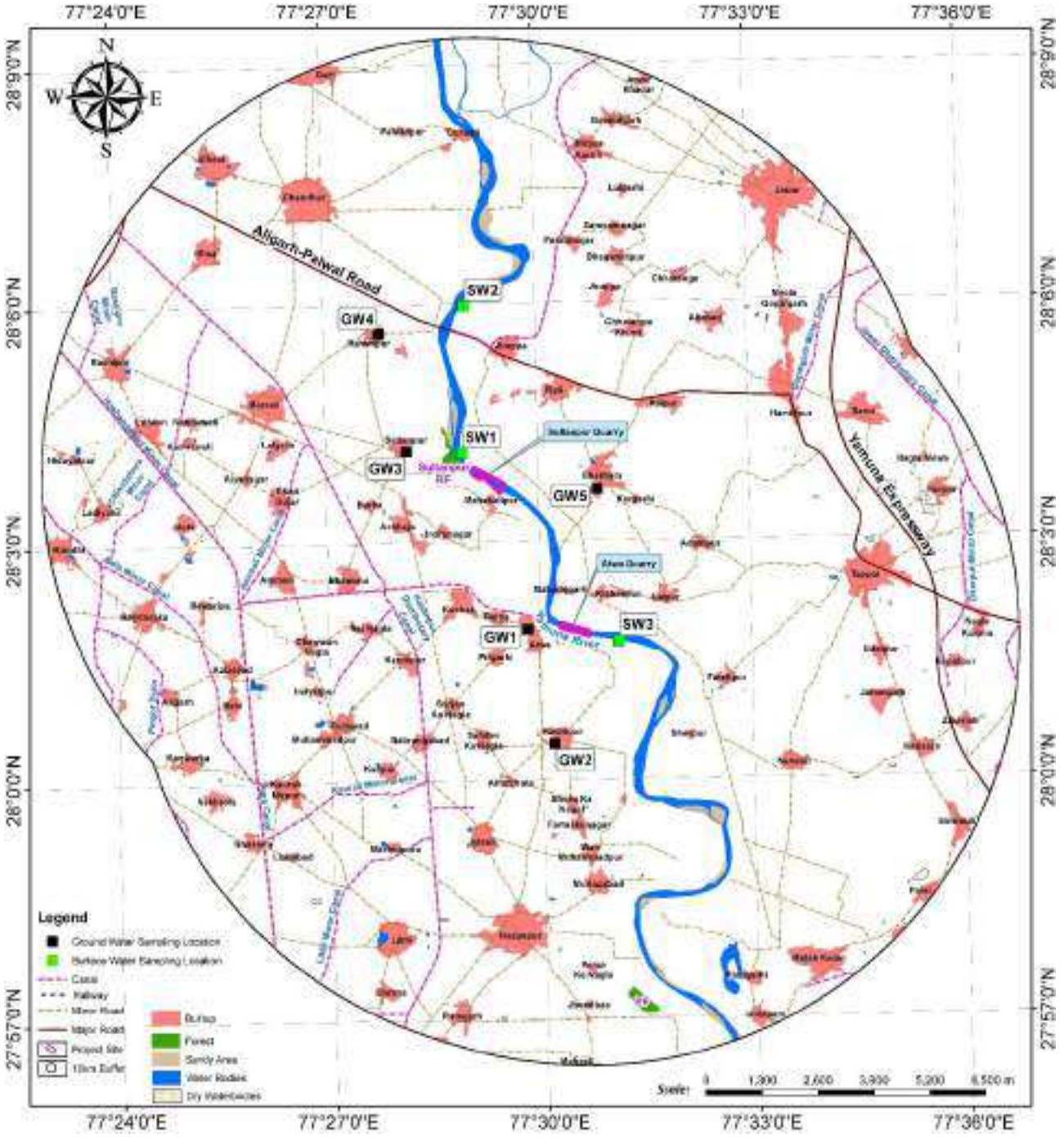
Water samples were collected from the available identified water bodies during the post-monsoon season (October 2022 to December 2022). Five ground water sources were examined for physico-chemical and heavy metals to access the effect of the already ongoing activities on surface and ground water. Water sampling locations are given in Table 3.8 & Figure 3.10.

Table 3-8: Ground Water Sampling Location

Location Name	Location Code	Distance (km)	Direction	Co-Ordinates	
				Latitude	Longitude
Atwa	GW1	0.76	W	28°01'53.85"N	77°29'48.83"E
Kashipur	GW2	2.64	SSW	28°00'27.46"N	77°30'10.18"E
Sultanpur	GW3	1.59	WNW	28°04'09.39"N	77°28'08.35"E
Rahimpur	GW4	3.86	WNW	28°05'38.40"N	77°27'46.27"E
Gharbara	GW5	1.93	ESE	28°03'34.09"N	77°30'41.36"E

HP- Hand Pump

Figure 3.9: Water Sampling Locations



Analyses of the samples were carried out as per established standard methods and procedures prescribed by CPCB, IS 3025 Codes and APHA 23rd edition, 2017. Samples for chemical analysis were collected in glass/plastic sterilized water bottles. Samples collected for metal content were acidified with 1 ml HNO_3. Parameters like dissolved oxygen (DO) and pH were analysed at the time of sample collection. The analyze details of ground water is given below.

Table 3-9: Ground Water Results

		Source	Handpump / Borewell					IS 10500 :2012	
S. No.	**Parameters**	**Unit**	**GW-1**	**GW-2**	**GW-3**	**GW-4**	**GW-5**	**AL**	**PL**
1	pH	--	7.4	7.3	7.1	7.8	7.6	6.5-8.5	NR
2	Conductivity	µS/cm	1341	1311	1348	1411	1355	$	$
3	Total Dissolve Solids	mg/l	827	822	814	851	819	500	2000
4	Alkalinity as $CaCO_3$	mg/l	245.6	239.5	218.5	264.9	274.9	200	600
5	Total Hardness as $CaCO_3$	mg/l	313.6	310.7	301.2	304.0	302.0	300	600
6	Calcium as Ca	mg/l	68.3	72.4	67.1	62.3	65.8	75	200
7	Magnesium as Mg	mg/l	34.8	31.6	32.5	36.1	33.5	30	100
8	Sodium	mg/l	133	136	141	138	132	$	$
9	Potassium	mg/l	21	14	11	18	17	$	$
10	Bicarbonate	mg/l	245.6	239.5	218.5	264.9	274.9	$	$
11	Chloride as Cl	mg/l	251.5	246.2	261.4	256.3	215.0	250	1000
12	Sulphate as SO_4	mg/l	56.4	52.4	58.1	55.2	59.2	200	400
13	Nitrate as NO_3	mg/l	10.4	14.3	11.5	8.5	9.5	45	NR
14	Total Nitrogen as N	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	$	$
15	Fluoride as F	mg/l	0.62	0.69	0.51	0.84	0.79	1.00	1.50
16	Total Phosphorus as P	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	$	$
17	Phenolic compound as C_6H_5OH	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002
18	Cyanide	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	NR
19	Aluminium	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	0.2
20	Arsenic	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.05
21	Cadmium	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	NR
22	Chromium as Cr^{+6}	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	NR
23	Iron	mg/l	0.25	0.21	0.19	0.22	0.19	0.3	NR
24	Copper	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	1.5
25	Lead	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	NR
26	Manganese	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	0.3
27	Mercury	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	NR
28	Zinc	mg/l	2.16	2.84	3.01	2.39	2.81	5	15

AL- Acceptable Limit, PL- Permissible Limits in absence of alternate sources, NR- No Relaxation

GROUND WATER RESULTS INTERPRETATION

All the parameters were observed mostly exceeding the acceptable limits but well within permissible limits for drinking water standard 10500:2012. pH (7.1 to 7.8), TDS (814 mg/l to

851 mg/l), alkalinity (218.5 mg/l to 274.9 mg/l), Total Hardness (301.2 mg/l to 313.6 mg/l), Calcium as Ca (62.3 mg/l to 72.4 mg/l), Magnesium as Mg (31.6 mg/l to 36.1 mg/l), Chloride (215.0 mg/l to 261.4 mg/l) & Sulphate (52.4 mg/l to 59.2 mg/l) parameters were analysed. Water was also analysed for heavy metal and biological parameters and observed good quality of water. Water is not good for direct drinking, should be used after treatment.

3.4.7. Surface Water Quality

Table 3-10: Surface Water Sampling Location

Location Name	Location Code	Distance (km)	Direction	Co-Ordinates	
				Latitude	Longitude
Yamuna River Near Sultanpur	SW1	0.53	NNW	28°04'08.02"N	77°28'55.49"E
Yamuna River near Jewar Palwal Road	SW2	3.9	N	28°05'58.71"N	77°28'59.26"E
Yamuna River Near Bilochpur	SW3	0.67	ESE	28°01'44.55"N	77°31'05.78"E

Table 3-11: CPCB Water Quality Criteria

Designated Best Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less
		pH between 6.5 and 8.5
		Dissolved Oxygen 6mg/l or more
		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 Wildlife 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

The analyze details of surface water is given in Table 3.12.

Table 3-12: Surface Water Results

S. No.	Parameters	Unit	SW-1	SW-2	SW-3	CPCB Standards*	
						IS 2296	Class
1	Turbidity	NTU	31.6	29.8	34.8	$	$
2	pH	--	7.9	7.2	7.6	6.5 – 8.5	Class A
3	Temperature	^{0}C	25.3	24.9	26.2	$	$
4	Total Suspended Solids	mg/l	63	58	55	$	$
5	Conductivity	µS/cm	1988	1877	1989	$	$
6	Total Dissolve Solids	mg/l	1211	1189	1224	$	$

S. No.	Parameters	Unit	SW-1	SW-2	SW-3	CPCB Standards*	
						IS 2296	Class
7	Alkalinity as $CaCO_3$	mg/l	498.7	472.6	463.9	$	$
8	Total Hardness as $CaCO_3$	mg/l	679.5	681.7	717.8	$	$
9	Calcium as Ca	mg/l	201.6	194.7	218.6	$	$
10	Magnesium as Mg	mg/l	42.9	47.6	41.9	$	$
11	Sodium	mg/l	84	81	76	$	$
12	Potassium	mg/l	7	8	6	$	$
13	Bicarbonate	mg/l	498.7	472.6	463.9	$	$
14	Chloride as Cl	mg/l	221.6	214.2	243.6	$	$
15	Sulphate as SO_4	mg/l	121.6	137.2	132.5	$	$
16	Nitrate as NO_3	mg/l	27.6	23.6	28.7	$	$
17	Total Carbon	mg/l	<1	<1	<1	$	$
18	Fluoride as F	mg/l	0.79	0.81	0.98	1.5	$
19	Phenolic compound as C_6H_5OH	mg/l	<0.001	<0.001	<0.001	0.005	$
20	Nickel	mg/l	<0.03	<0.03	<0.03	$	$
21	Arsenic	mg/l	<0.020	<0.020	<0.020	0.2	$
22	Cadmium	mg/l	<0.01	<0.01	<0.01	$	$
23	Chromium as Cr^{+6}	mg/l	<0.05	<0.05	<0.05	$	$
24	Iron	mg/l	0.84	0.71	0.89	$	$
25	Lead	mg/l	<0.1	<0.1	<0.1	$	$
26	Zinc	mg/l	3.9	3.2	4.1	$	$
27	Dissolve Oxygen	mg/l	5.8	5.9	6.4	5	Class A, B
28	COD	mg/l	132	128	136	$	$
29	BOD, 27°C 3 days	mg/l	44	46	39	3	Below E**
30	Total Coliforms	MPN / 100ml	1.4×10^3	1.6×10^3	1.6×10^3	500	Class C

IS 2296-class B designated for inland surface water & class as per CPCB Water Quality Criteria, ** Not meeting to any class defined by CPCB.

OBSERVATIONS & INTERPRETATIONS

The parameters were analysed as per Indian Standard 2296 & APHA methodology and compared to the defined water quality of CPCB as the categorization has been given in above table. The pH was varying between 7.2 to 7.6. Dissolved Oxygen of the sources was varying between 5.8 to 6.4. BOD was observed 39 mg/l to 46 mg/l. Total Coliform were observed varying between 1400 to 1600 MPN/100ml. Water was not usable due to bad quality.

3.5. Meteorological Condition

Meteorology is the key to understand the air quality. The essential relationship between meteorological condition 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.

3.5.1. Meteorological Data as per IMD Gurugram (Haryana)

The meteorological data is collected from the IMD station at Gurugram, which is the nearest IMD station (Approx 60 km) to the project site. The data collected from IMD includes wind speed, wind direction (recorded in sixteen directions), temperature, relative humidity, atmospheric pressure;

rainfall and cloud cover over a period of 30 years from the year 1981 to 2010. All these parameters were recorded twice a day viz at 08.30 and 17.30 hours. The monthly maximum, minimum and average values are collected for all the parameters like rainfall, temperature, humidity & wind speed are presented in Table 3.13.

Table 3-13: Meteorological Table as per IMD, Gurugram (1981-2010)

Season / Month		Rainfall (mm)	Temperature (°C)		Humidity (%)		Wind	
			Max	Min	08.30 hrs.	17:30 hrs.	Speed (kmph)	Direction
Winter	December	9.9	27.0	2.8	80.0	55.0	2.0	NW, W
	January	15.0	24.9	2.4	82.0	54.0	2.8	NW, W
	February	21.4	28.7	4.2	73.0	45.0	3.4	NW, SE
	Total / Mean	**46.3**	**26.9**	**3.1**	**78.3**	**51.3**	**2.7**	**-**
Summer	March	12.3	35.7	8.0	65.0	37.0	4.1	NW, SE
	April	18.2	42.1	13.3	49.0	28.0	4.3	NW, W
	May	34.3	44.5	18.3	48.0	31.0	4.6	NW, SE
	Total / Mean	**64.8**	**40.8**	**13.2**	**54.0**	**32.0**	**4.3**	**-**
Monsoon	June	67.3	44.9	24.6	57.0	40.0	5.5	NW, SE
	July	171.3	40.2	23.1	76.0	63.0	4.1	SE, NW
	August	190.7	37.8	23.2	81.0	69.0	2.1	SE, NW
	September	93.8	37.6	20.5	74.0	59.0	2.6	NW, SE
	Total / Mean	**523.1**	**40.1**	**22.9**	**72.0**	**57.8**	**3.6**	**-**
Post-Monsoon	October	12.0	36.2	12.4	66.0	45.0	1.9	NW, SE
	November	10.7	32.7	7.2	66.0	47.0	1.6	NW, W
	December	9.9	27.0	2.8	80.0	55.0	2.0	NW, W
	Total / Mean	**32.6**	**32.0**	**7.5**	**70.7**	**49.0**	**1.8**	**-**
Total Annual average Rainfall is 657 (mm)								

Source: ***https://imdpune.gov.in/library/publication.html;***

3.5.2. Onsite Micro-Meteorology (Hourly)

The data on meteorological parameters in the study area were monitored continuously for post-monsoon season (October 2022 to December 2022). A meteorological station was setup on the roof top a house in nearby habitat to proposed lease. Wind speed, wind direction, dry and wet bulb temperature, relative humidity, and general weather conditions were recorded throughout the study period in an automated data logger.

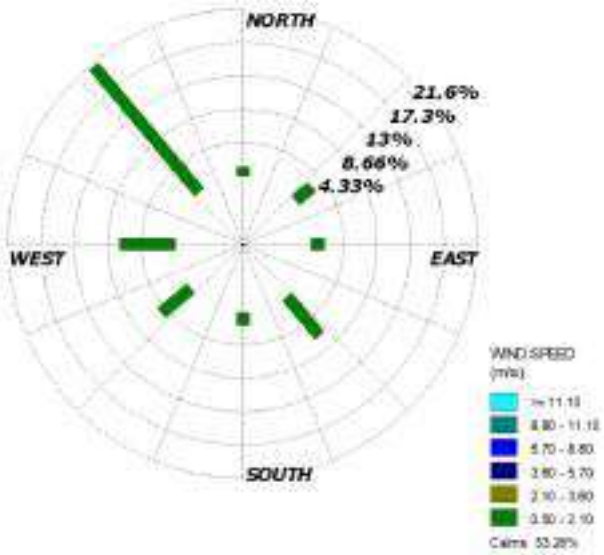
Table 3-14: On-site Micro Meteorological Data

Months	Temperature (°C)			Relative Humidity (%)			Average Wind Speed		Rainfall
	Max.	Min.	Average	Max.	Min.	Average	m/s	kmph	mm
October	35.3	14.7	25.7	95.6	51.3	65.5	1.4	5.1	127.5
November	33.1	10.3	22.1	73.1	43.6	55.1	1.2	4.4	0.0
December	28.8	8.2	19.4	84.5	42.6	54.7	1.2	4.3	6.6
Average	**32.4**	**11.1**	**22.4**	**84.4**	**45.8**	**58.4**	**1.3**	**4.6**	**134.1**

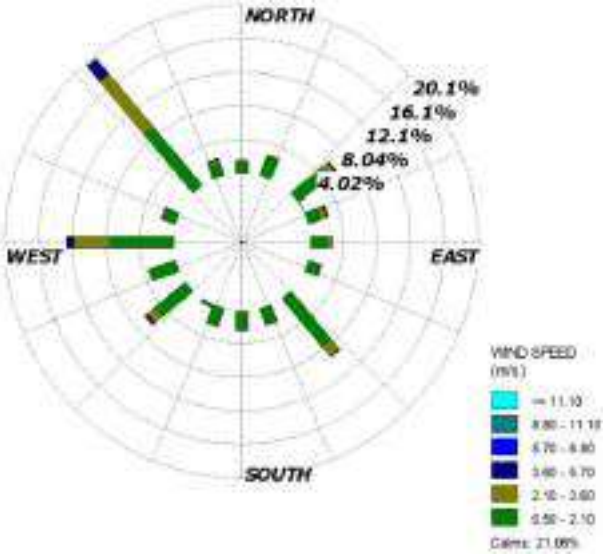
The maximum temperature recorded during the study period was 35.3°C in the month of October and the minimum temperature was 8.2°C in the month of December. The highest RH found in the study area was 95.6% in the month of October, while minimum monthly average RH found

42.6% in the month of December. The average wind speed recorded was 1.3 m/sec. Predominant wind direction during the study period was mainly South-West to North-East followed by North-East to South-West. Hourly onsite micro-meteorological data is enclosed as **Annex 4.1**.

Figure 3.10: Wind Pattern as per IMD Gurugram & Onsite



Post-Monsoon (IMD Gurugram)



Post-Monsoon (On Site)

3.6. Air Environment

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the core and buffer zone of 10 km radius around the proposed project site forms the baseline information. The sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic fuel/ biomass burning. The quantification of impacts of the proposed project on the ambient air quality requires to evaluate the existing ambient air quality of the area.

3.6.1. Monitoring Methodology, Parameters & Locations

Monitoring has been carried out as per the latest CPCB and MoEF&CC guidelines and notifications. This is to allow a comparison with the present revised standards mentioned in the latest Gazette Notification of the Central Pollution Control Board (November 2009).

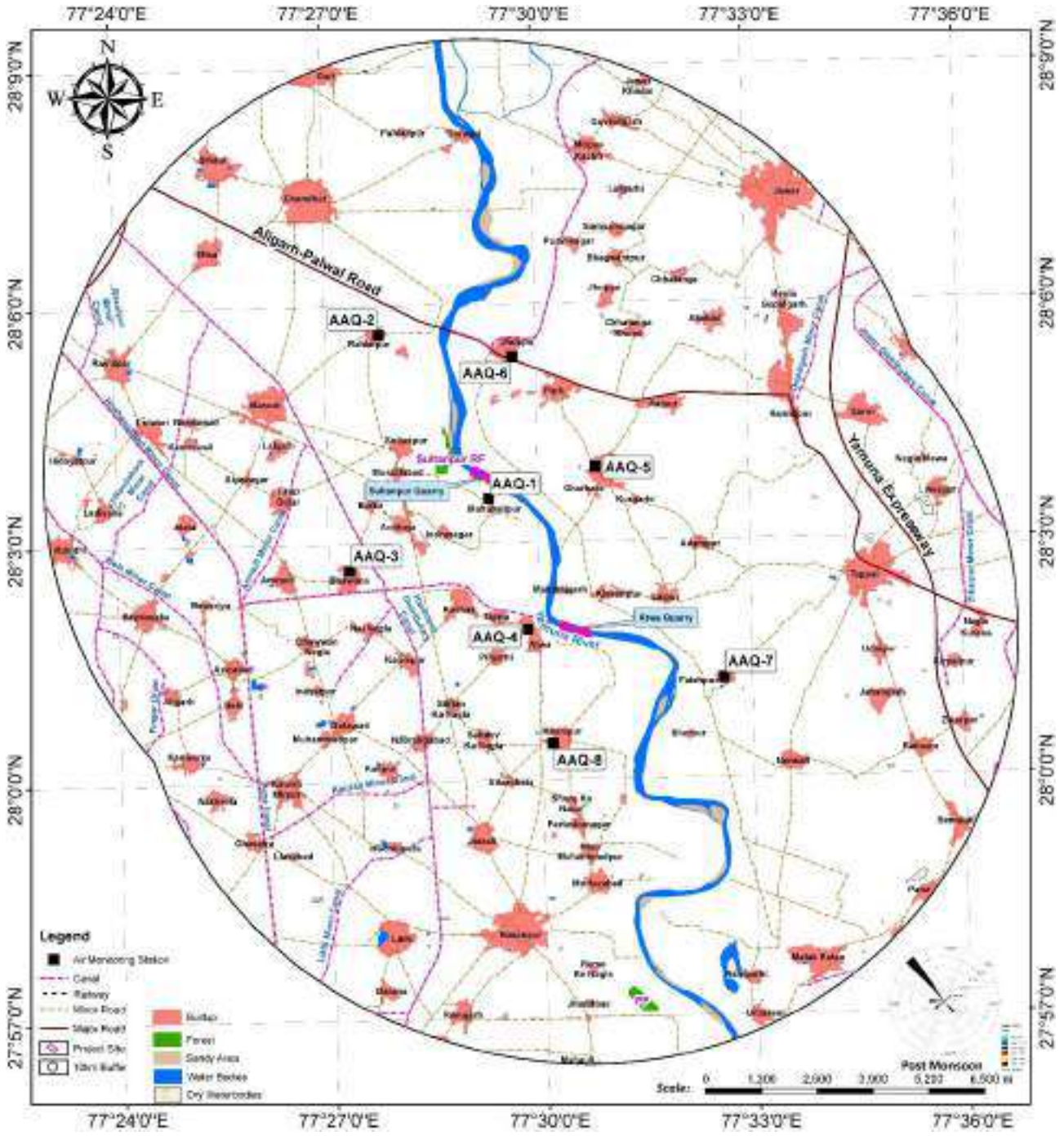
The monitoring has been carried out at a frequency of two samples per week at each of 8 locations, adopting a continuous 24-hour continuous schedule for Particulate Matter, Sulphur Dioxide and Nitrogen Dioxide except CO for one hour. It was ensured that the equipment was placed at a height of at least 1 m to 1.5 m above the ground level at each monitoring station, for negating the effects of windblown ground dust. Also, distance of the sampler to any air flow obstacle i.e., buildings, must be more than two times the height of the obstacle above the sampler has been ensured. The equipment was placed at open space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results.

The sampling locations for ambient air quality were established based on the following considerations: Meteorological conditions including wind direction, Topography of the study area; and Representativeness of regional background air quality for obtaining baseline status.

Table 3-15: Ambient Air Monitoring Locations

S. No.	Location Name	Code	Zone	Distance (km)	Direction	Latitude	Longitude
1	Mahabalipur	AAQ-1	Core	0.29	NW	28°03'33.01"N	77°29'17.44"E
2	Rahimpur	AAQ-2	Buffer	3.86	WNW	28°05'38.40"N	77°27'46.27"E
3	Bhawana	AAQ-3	Buffer	3.63	SW	28°02'40.35"N	77°27'17.76"E
4	Atwa	AAQ-4	Core	0.76	W	28°01'53.85"N	77°29'48.83"E
5	Gharbhara	AAQ-5	Buffer	2.13	ENE	28°03'55.92"N	77°30'48.73"E
6	Jhuppa	AAQ-6	Buffer	2.73	NNE	28°05'20.23"N	77°29'39.74"E
7	Fatehpur	AAQ-7	Buffer	3.27	ESE	28°01'15.22"N	77°32'35.38"E
8	Kashipur	AAQ-8	Buffer	2.64	SSW	28°00'27.49"N	77°30'10.28"E

Figure 3.11: Ambient Air Monitoring Locations



3.6.2. Air Quality of Study Area

Consolidated values of ambient air quality are given in Table 3.16. The locations-wise air quality results twice a weak are given in separate document which is enclosed as **Annex 3.2**.

Table 3-16: Ambient Air Quality Results

Parameters				PM_{10}			$PM_{2.5}$			SO_2			NO_X			CO		
Name of monitoring equipment used				RDS			Fine Particle Sampler			RDS with Gas Attachments			RDS with Gas Attachments			CO Analyzer (NDIR)		
Equipment sensitivity				5 µg/m³												0.1 mg/m³		
AAQ standard (CPCB) for Industrial, Residential & other Areas				100 µg/m³			60 µg/m³			80 µg/m³			80 µg/m³			4 mg/m³		
AAQ standard (CPCB) for Sensitive Areas				100 µg/m³			60 µg/m³			80 µg/m³			80 µg/m³			4 mg/m³		
Code	Location Name	Samples	Category (R, I, S)	Min.	Max	98% tile	Min.	Max.	98% tile	Min.	Max.	98% tile	Min.	Max.	98% tile	Min.	Max.	98% tile
AAQ-1	Mahabalipur	24	R	38	72	72	17	31	31	6.8	9.5	9.4	10.1	13.9	13.9	0.58	1.09	1.09
AAQ-2	Rahimpur	24	R	49	77	76	17	25	25	6.9	9.9	9.9	10.4	13.8	13.7	0.49	0.92	0.92
AAQ-3	Bhawana	24	R	41	75	73	15	28	28	6.2	10.6	10.2	10.1	14.8	14.2	0.46	1.12	1.09
AAQ-4	Atwa	24	R	41	80	80	17	28	28	6.4	10.1	10.0	10.1	14.9	14.6	0.49	0.98	0.95
AAQ-5	Gharbhara	24	R	44	73	73	16	25	25	6.4	10.1	9.6	10.1	13.9	13.7	0.49	1.05	1.02
AAQ-6	Jhuppa	24	R	48	78	77	17	26	26	6.9	10.1	9.7	10.4	15.2	15.0	0.51	1.09	1.07
AAQ-7	Fatehpur	24	R	45	69	69	16	22	22	6.9	9.9	9.7	10.1	14.1	14.0	0.58	1.06	1.04
AAQ-8	Kashipur	24	R	46	72	72	16	24	24	6.7	9.4	9.3	10.1	14.1	13.9	0.51	1.09	1.07

**** 24 hourly or 8 hourly or 1 hourly monitored value, as applicable shall be complied with 95% of the time in a year, ** Annual Arithmetic Means of minimum 104 measurements in a year at a site taken twice a week 24 hourly at uniform intervals, *** Category defined as Residential, Industrial & Sensitive. 5% of the time they may exceed the limits but not on two consecutive days of monitoring, For CO 1 hourly standard is being considered.***

Table 3-17: Mineralogical Composition of PM10

Location Name	Date	PM 10 (µg/m³)	Free Silica (%)	Ca (µg/m³)	Mg (µg/m³)	Ni (µg/m³)	Pb (µg/m³)
Mahabalipur	18.10.2022	61	3.4	1.78	0.58	<0.5	0.08
Rahimpur	24.10.2022	59	2.8	1.44	0.66	<0.5	0.05
Bhawana	10.11.2022	46	1.9	1.92	0.81	<0.5	0.03
Bilochpur	25.10.2022	61	2.4	1.66	0.59	<0.5	0.09
Gharbhara	25.11.2022	58	1.7	1.71	0.44	<0.5	0.11
Jhuppa	04.12.2022	54	2.6	1.58	0.83	<0.5	0.04
Fatehpur	04.11.2022	52	2.2	1.66	0.58	<0.5	0.07
Kashipur	24.10.2022	48	1.7	1.93	0.67	<0.5	0.07

INTERPRETATION

- ✓ **Particulate Matter**: PM_{10} particulate matter 10 varying from 38 µg/m^3 to 80 µg/m^3. $PM_{2.5}$ was observed 15 µg/m^3 to 31 µg/m^3.
- ✓ **Gaseous Pollutants**: SO_2 was varying from 6.2 µg/m^3 to 10.6 µg/m^3. NOx was observed 10.1 µg/m^3 to 15.2 µg/m^3 in study area. CO was observed from 0.46 mg/m^3 to 1.12 mg/m^3 in study area.
- ✓ The mineralogical composition of free silica in PM10 was also analysed and is presented in the Table 4.17, which follows the standard ToR requirement.

As per the results observed of ambient air quality of the project site and the surrounding areas, the ambient air quality is well below the NAAQS limits, however after commissioning of the project the prevailing baseline status of area will be changed so to maintain the ambient air quality of the area. To control the air pollution, proper measurements along with suitable EMP will be adopted, which will be elaborated in environment management plan and impact chapter of report.

3.7. Noise Environment

3.7.1. Ambient Noise Level Monitoring Stations

In the present study, sound pressure levels (SPL) were measured by a sound level meter (Model: Envirotech Make SLM 100). Since loudness of sound is important for its effects on people, the dependence of loudness upon frequency must be considered in noise impact assessment. This has been achieved using A-weighting filters in the noise measuring instrument which gives a direct reading of approximate loudness. A-weighted equivalent continuous sound pressure level (Leq) values have been computed from the values of A-weighted sound pressure level measured with the help of noise meter.

3.7.2. Frequency & Parameters of Sampling

Noise levels were recorded continuous for 24 hours at an interval of 60 minutes during the day and night times to compute the day equivalent, night equivalent and day-night equivalent level. The noise level was monitored once during the study period at each monitoring location. The noise level is recorded in dB(A). The important parameters measured are Leq, Lday, and Lnight.

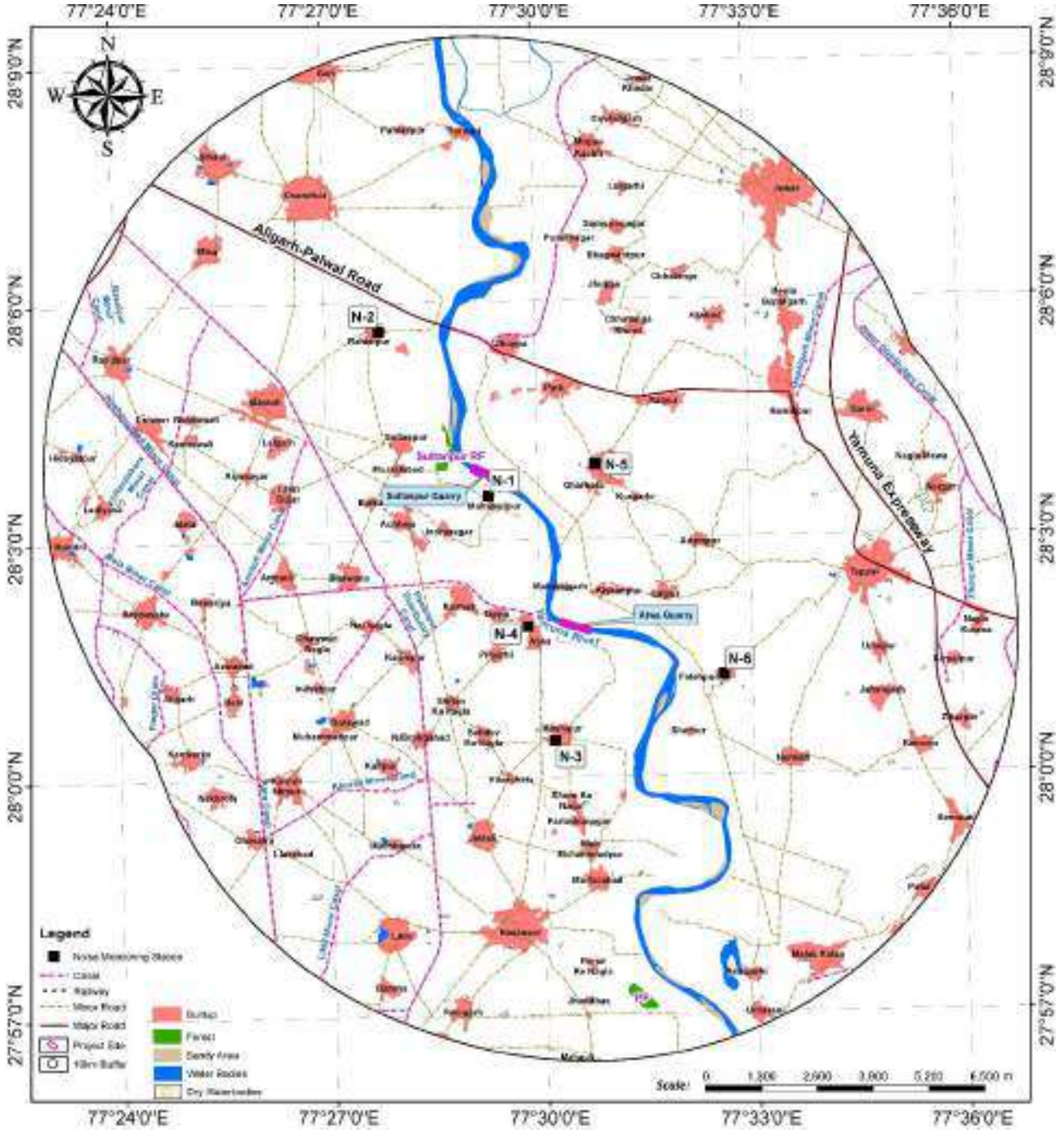
3.7.3. Ambient Noise Level Monitoring Locations

Assessment of ambient noise levels is an important parameter in preparation of impact assessment report. The environmental impact of noise can have several effects varying from annoyance to hearing loss depending on loudness of noise levels. The monitoring for noise levels were done in Six locations keeping considering the population and traffic of the area.

Table 3-18: Ambient Noise Monitoring Locations

S. No.	Location Name	Location Code	Distance (km)	Direction	Latitude	Longitude
1	Mahabalipur	N-1	0.29	NW	28°03'33.01"N	77°29'17.44"E
2	Rahimpur	N-2	3.86	WNW	28°05'38.40"N	77°27'46.27"E
3	Kashipur	N-3	2.64	SSW	28°00'27.50"N	77°30'10.27"E
4	Atwa	N-4	0.76	W	28°01'53.85"N	77°29'48.83"E
5	Gharbhara	N-5	2.13	ENE	28°03'55.92"N	77°30'48.73"E
6	Fatehpur	N-6	3.27	ESE	28° 1'15.22"N	77°32'35.38"E

Figure 3.12: Ambient Noise Level Locations



3.7.4. Method of Monitoring

At each location, noise monitoring has been carried out once during study period over a period of 24 hours to obtain Leq values at uniform time intervals of 1 hour. In each hourly time interval Leq values have been computed from SPL readings taken at uniform time intervals of 10 minutes. For each location, day and night-time Leq values have then been computed from the hourly Leq values such that comparison could be made with the national ambient noise standards. Day time Leq was computed from the hourly Leq values between 6.00AM - 10.00PM and night-time Leq from the hourly Leq values between 10.00PM- 6.00AM.

For noise levels measured over a given period interval, it is possible to describe important features of noise using statistical quantities. This is calculated using the percent of the time certain noise levels exceeds the time interval.

The notation for the statistical quantities of noise levels is described below:

- ✓ Hourly Leq values have been computed by integrating sound level meter.
- ✓ **Lday**: As per the CPCB guidelines the day-time limit is between 06:00 hours to 22.00 hours as outlined in Ministry of Environment and Forest Notification S.O. 123 (E) dated 14/02/2000.
- ✓ **Lnight**: As per the CPCB guidelines the night-time limit is between 22:00 hours to 06.00 hours as outlined in Ministry of Environment and Forest Notification S.O. 123 (E) dated 14/02/2000.
- ✓ **Ldn**: A rating developed by Environmental Protection Agency, (US-EPA) for specification of community noise from all the sources is the Day Night Sound Level, (Ldn). It is like a 24-hr equivalent sound level except that during night period (10 PM to 06 AM) a 10 dB (A) weighting penalty is added to the instantaneous sound level before computing the 24-hr average.

Table 3-19: Ambient Noise Level (CPCB Standards)

Area Code	Type of Area	Limits in dB(A) Leq*	
		Day (06:00hrs to 20:00hrs)	Night (20:00hrs to 06:00hrs)
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

**** Silence zone is defined as an area up to 100 meters around such premises as hospitals, educational institutions, and courts. The silence zones are to be declared by the competent authority.***

3.7.5. Ambient Noise Level in Study Area

An analysis of the different Leq data obtained during the study period has been made. Variation was noted during the day - time as well as night - time. The results are presented in Table 3.20.

Table 3-20: Ambient Noise Quality Result

Noise Location	Zone	Code	Day				Night			
			Std.	L Max	L Min	L eq	Std.	L Max	L Min	L eq
Mahabalipur	Residential	AN-1	**55**	54.1	39.4	51.0	**45**	40.2	28.1	34.7
Rahimpur		AN-2	**55**	51.5	38.4	48.1	**45**	37.6	28.9	34.1
Kashipur		AN-3	**55**	54.9	40.8	50.7	**45**	38.9	27.4	34.9
Atwa		AN-4	**55**	55.6	40.5	51.7	**45**	39.8	29.1	36.0
Gharbhara		AN-5	**55**	54.2	40.2	50.8	**45**	39.8	28.7	35.7
Fatehpur		AN-6	**55**	50.6	37.9	46.9	**45**	38.6	29.8	34.8

The Sound Pressure Level recorded during the daytime on all locations varies from 37.9 dB(A) to 55.6 dB(A) & in time it varies between 27.4 dB(A) to 40.2 dB(A). The noise level was found well within prescribed standards due to absence of any major noise generating activities in the area.

3.8. Biological Environment

Study of biological environment is one of the important aspects for the Environmental Impact Assessment, in view of the need for conservation of Environmental quality and biodiversity of geographical area. Ecological systems show complex interrelationship between biotic and Abiotic components including dependence, competition, and mutualism. Biotic components comprise of plant and animal communities which interact not only within and between themselves but also with the Abiotic components viz. Physical and Chemical, components of the environment.

Generally, biological communities are the good indicators of climatic and edaphic factors. Studies on biological aspects of ecosystems are important in Environmental Impact Assessment for safety of natural flora and fauna. Information on the impact of environmental stress on the community structure serves as an inexpensive and efficient early warning system to check the damage to a particular ecosystem. The biological environment includes mainly terrestrial and aquatic ecosystems.

The animal and plant communities exist in their natural habitats in well-organized manner. Their natural settings can be disturbed by any externally induced anthropological activities or by naturally induced calamities or disaster. So, once this setting is disturbed, it becomes practically impossible or takes a longer time to come to its original state. Plants and animals are more susceptible to environmental stress. The sensitivity of animal and plant species to the changes occurring in their existing ecosystem can, therefore, be used for monitoring Environmental Impact Assessment studies of any project.

3.8.1. Objective of Biological Study

The main objectives of biological study were:

- ✓ To collect the baseline data for the study along with a description of the existing terrestrial, wetland, and aquatic biodiversity.
- ✓ To assess the scheduled species in the proposed site (rare, endangered, critically endangered, endemic, and vulnerable).
- ✓ To identify the locations and features of ecological significance.
- ✓ To identify the Impacts of proposed project before, after and during development phase.

Table 3-21: Mode of Data Collection and Parameters

Sr. No.	Aspect	Mode of Data collection	Parameters monitored	Remarks
1.	Terrestrial Biodiversity	By field survey	Floral and Faunal diversity	**For Floral Diversity:** Random survey, sapling survey/forest inventory, walking transects, collection and identification with the help of relevant literature. **For Faunal Diversity:** direct and indirect sampling, walking transects, point sampling and nest sampling etc.
2.		From authentic sources like Forests department of	Floral and Faunal diversity and study of vegetation,	Data collected from the working plan of the region, forest types from the

Sr. No.	Aspect	Mode of Data collection	Parameters monitored	Remarks
		Haryana and available published literatures from ZSI, BSI etc.	forest type, importance etc.	authentic literature of Champion & Seth.
3.	Aquatic Biodiversity	By field survey	Floral and Faunal diversity	**For Plankton Study-** Lackey's drops method and light microscope **For other aquatic-** Random survey, opportunistic observations
4.		From authentic sources like Forests department of Haryana.	Floral and Faunal diversity and study of vegetation, forest type, importance etc.	Desktop literature review to identify the representative spectrum of threatened species, population and ecological communities.

3.8.2. Environmental Sensitivity of the Study Area

There is no wildlife sanctuary, elephant corridor, tiger reserve or any sensitive receptor within study area (10 km) from lease area. Clarification for No forest involved in proposed lease for both pits have been obtained vide Reference No. (SRN): QC6-9N2-V919 dated 28.09.2022 for Sultanpur unit & Reference No. (SRN): XU8-D8R-RJVJ dated 28.09.2022 for Atwa unit.

Table 3-22: Environmental Settling of Study Area (15km Buffer)

S. No.	Accessibility	Description	Distance	Direction
1	Roads	NH-2	13.39 (km)	W
		Aligarh Palwal Road	6.99 (km)	ENE
2	Railway Stations	Rundhi Railway Station	13.11 (km)	W
3	Religious Place	Atma Ram Mandir	0.28 (km)	WNW
		Siddh baba Temple	2.30 (km)	NW
4	Airport	Jewar Airport	16.06 (km)	NE
5	Hospitals	Govt Hospital Sihol	8.96 (km)	NNW
		Santosh Hospital tappal	7.05 (km)	ENE
6	School / Institutes	M.V.N Convent School Achheja	1.61 (km)	SW
		Govt Primary School	2.75 (km)	NW
7	Post Office	Post Office Tappa	1.35 (km)	WNW
8	Nearby Settlements	Sultanpur	1.56 (km)	NW
		Atwa	0.70 (km)	SW
9	Interstate Boundary	Haryana-Uttar Pradesh	0.08 (km)	NNE
10	Waterbody	Yamuna River	0.05 (km)	SE
		Amrauli Minor Canal	4.53 (km)	WSW
		Hasanpur Distributary Canal	3.18 (km)	WSW
		Left Bata drain	5.21 (km)	WNW
		Bela Minor	7.70 (km)	WSW
		Hodal Distributary Canal	8.88 (km)	WSW
		Ladiyaka Minor	7.68 (km)	WSW
		Silauthi Minor	12.73 (km)	WNW
		Nandabara Minor	5.21 (km)	NW
		Rampur Distributary	13.33 (km)	NNW

S. No.	Accessibility	Description	Distance	Direction
		Kithwari Drain	13.48 (km)	NW
		Rasulpur Minor	9.64 (km)	NW
		Chajjunagar Minor	12.06 (km)	NW
		Kherla Drain	10.74 (km)	NW
		Hoshangabad Minor	8.78 (km)	NW
		Siwara Minor	12.49 (km)	NNE
		Bajauta Distributary	12.79 (km)	NE
		Waina Minor	10.80 (km)	NE
		Khaira Nala	6.47 (km)	E
		Dehar Nala	3.88 (km)	NE
		Jatari Minor	12.56 (km)	E
		Jewar Distributary	9.74 (km)	ESE
		Dehar Nala	5.77 (km)	NE
		Palar jhil	8.92 (km)	SE
		Dhundar Nala	6.85 (km)	SE
		Kunda Nala	7.66 (km)	SSE
		Untasani Minor	11.72 (km)	SE
		Gaunchhi Drain	11.80 (km)	SSW
		Likhi Minor	6.29 (km)	SW
		Pinger Drain	11.38 (km)	SW
		Jair Nala	9.88 (km)	NNW
		Tumsar Minor	14.23 (km)	SW
		Karauli Minor	5.61 (km)	SW
		Gudhrana Distributary	12.13 (km)	WSW
11	Forest	Protected Forest	8.32 (km)	SSE
		Sultanpur RF	0.43 (km)	NW
		Karauli Khadar PF	14.64 (km)	NNE

Source: SOI Toposheet (H43X8, H43X12, G43F5 & G43F9) & Google References.

Figure 3.13: Eco-regions of Haryana

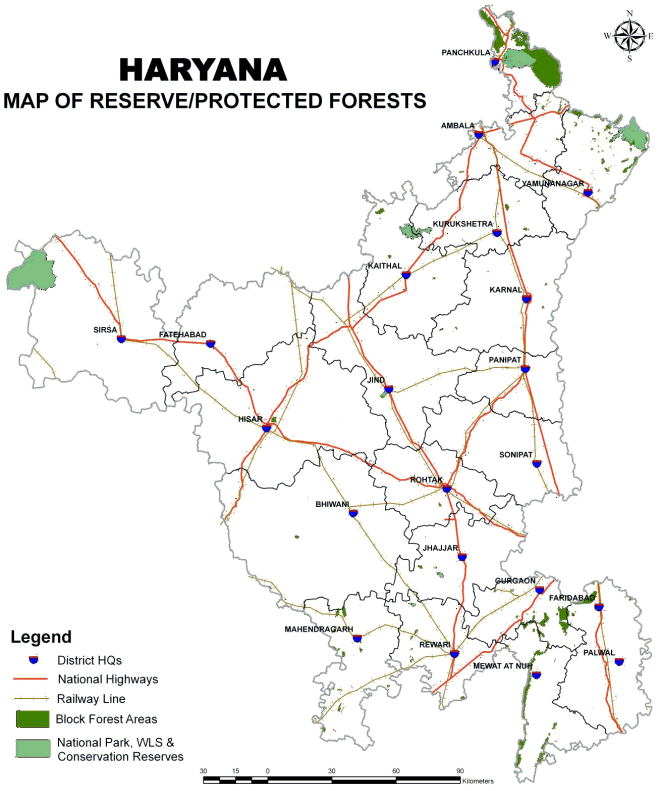
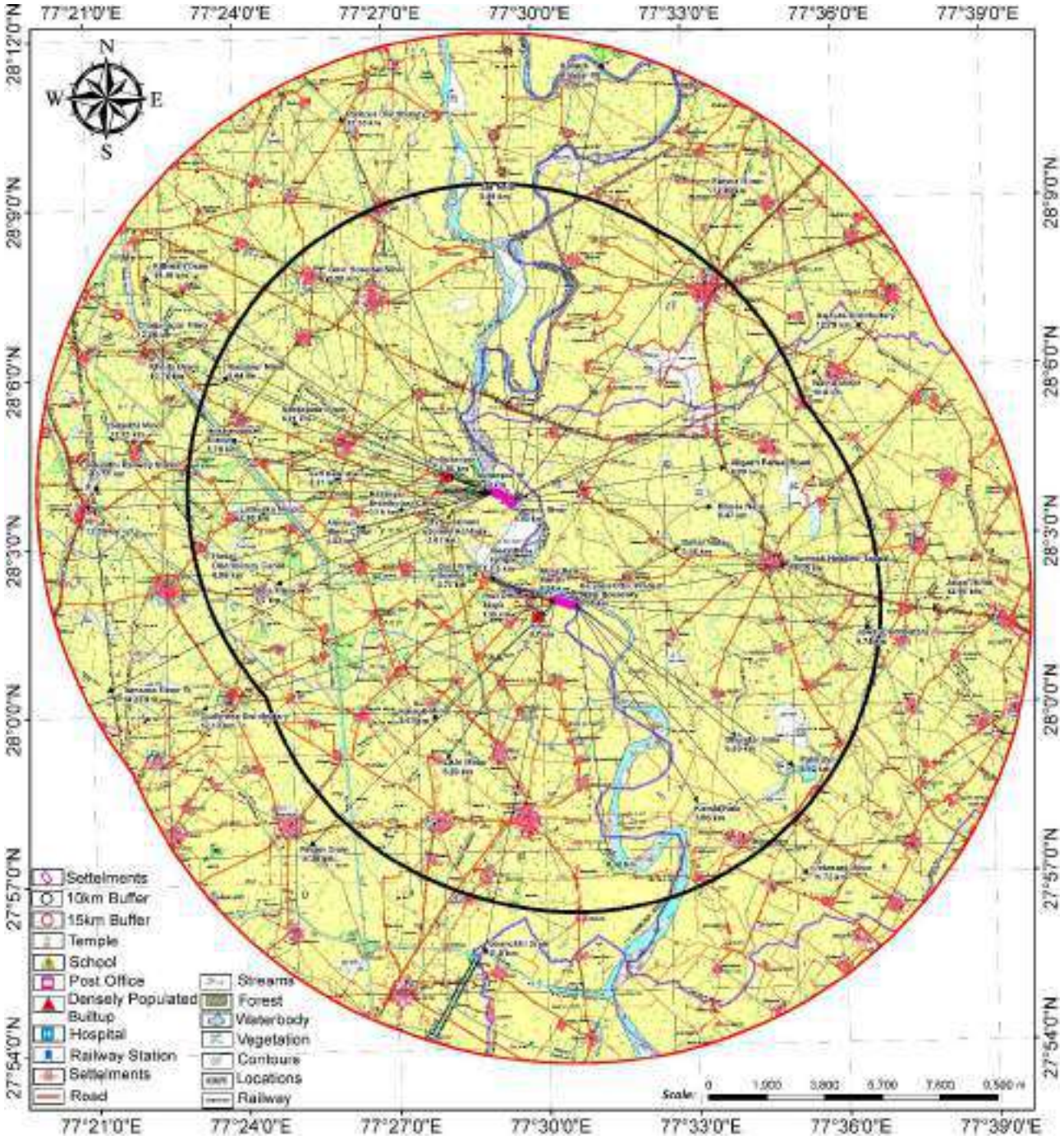


Figure 3.14: Environment Sensitivity Map (15 km Buffer) of Proposed Site



3.8.3. Ecology of the Study Area

Biological communities are the indicator environmental condition and resource of its distribution and survival. Biotic component comprises of both plants (Flora) and animals (Fauna) communities, which interact not only within and between them but also with the Abiotic components, viz. physical and chemical components of the environment. The changes in biotic community are studied in the pattern of distribution, abundance, and diversity. The study area is divided into two parts i.e.:

Core Zone: Project Site i.e., Sultanpur unit river sand mine, District- Palwal, Haryana.

Buffer Zone: Area within 10 Km radius from the project site.

Methodology: The present study on the floral assessment for the project activity is based on the field survey of the area. By the following forest inventory methodology, the survey of biological parameters has been conducted within the core zone and buffer zone (10 km radial distance) from project site at village- Sultanpur & Atwa, Tehsil & District- Palwal, Haryana, in accordance with the guidelines issued by the ministry of Environment, Forest and Climate Change, CPCB and SPCB during the study period.

A preliminary survey of the study area has been performed to get a general picture of the landscapes in vegetation. Traverses have been taken within different zone of the study area to note major vegetation patterns and plant communities including their growth form and dominant species. A **forest inventory** is **"an attempt to describe the quantity and quality of forest trees and many of the characteristics of the land area upon which the trees are grown."**

The objective for this floral inventory of the study area is to provide complete checklist of floristic structure within the core zone and buffer zone (10 km radial distance) from project site for formulating effective management and conservation measures.

Biological environment is a good bio-indicator of changing environmental quality. Reconnaissance survey was undertaken around the proposed project site. In the present survey 10 km radius area around the project site was considered as study area. Both terrestrial and aquatic ecological analysis was carried out in the field and in the laboratory. Assessment of flora and fauna was undertaken in the study area. The field study was undertaken during November-2021.

In addition to the field study, literature review /desk research was carried out to determine the existing conditions within the study area and to identify habitats and species of potential importance that may be affected by the Project.

The following parameters were primarily considered in the study.

Assessment of present state of vegetation, flora and fauna in the study area.

Collection of data from literature about the flora and fauna accounts

Identification of rare, endangered plants and animal species (if any).

Identification of important plants/animals' species having diverse economic values.

The study area falls under the category of **Tropical Desert Thorn** and comprise predominantly of xerophytes. The area is sparsely populated and is almost plain. The study area contains plantations around villages. There is no wildlife and bird sanctuary within the study area. The biotic environment can be described under following heads:

- ✓ Core Zone: Project Site
- ✓ Buffer Zone: (Area within 10 km radius): The Buffer Zone can further be described as per the types of the land use.
  - i. Terrestrial Ecology
  - ii. Aquatic Ecology

3.8.4. Floral Ecology

The natural flora and fauna of the land habitats constitute terrestrial ecosystem. The study of terrestrial ecosystem is important as a part of the monitoring environmental changes. Due to rapid industrialization, currently the ecological status of an area changed dramatically. Thus, impact evaluation of any developmental activities is highly essential with a view to formulation of mitigatory plan layout.

Though natural vegetation of this area is very poor except some degraded patches of evergreen scrub or thorny forests, but overall floral diversity is high. The major components of natural forest are *Dhak of Palas (Butea monosperma), Jand (Prosopis cineraria), Kaur (Capparis decidua), Kikar (Acacia nilotica) and Datepalm (Phoenix sylvestris)*.

During present field survey, many plant species were recorded in different habitats. They are listed in Table 3.23. There is no rare and endangered plant species in the present study area.

Table 3-23: Floral Checklist of Buffer Zone

Sr. No.	SCIENTIFIC NAME	LOCAL NAME	FAMILY
	(A) Trees:		
1	*Acacia nilotica*	Kikar	Fabaceaae
2	*Acacia catechu*	Khair	Fabaceaae
3	*Albizia lebbeck*	Kala siris	Fabaceaae
4	*Albizia procera*	Safed siris	Fabaceaae
5	*Alslonia scholoris*	Chatim	Apocyanaceae
6	*Ailanthes excelsa*	Arusa	Simaroubaceae
7	*Azadiracta indica*	Neem	Meliaceae
8	*Bauhinia purpurea*	Kachnar	Caesalpiniaceae
9	*Bombax ceiba*	Semal	Malvaceae
10	*Butea monosperma*	Dhak	Fabaceae
11	*Cassia fistula*	Amaltas	Fabaceae
12	*Cassia siamea*	Kassod	Caesalpiniaceae
13	*Casuarina equisetifolia*	Jungli Saru	Casuarinaceae
14	*Callistemon speciosus*	Bottle Brush	Myrtaceae
15	*Crataeva nurvala*	Baruna	Capparaceae
16	*Dalbergia sissoo*	Shisham	Fabaceae
17	*Delonix regia*	Gulmohar	Fabaceae
18	*Diospyros cordifolia*	Bistendu	Ebenaceae
19	*Erythrina arborescens*	Roringe	Fabaceae
20	*Eucalyptus globosus*	Nilgiri/Safeda	Mytraceae
21	*Ficus benghalensis*	Bargad	Moraceae
22	*Ficus religiosa*	Pipal	Moraceae
23	*Ficus palmata*	Anjir	Moraceae
24	*Ficus glomerata*	Gullor	Moraceae
25	*Holoptelea integrifolia*	Papri	Ulmaceae
26	*Pithecellobium dulce*	Jungle Jalebi	Fabaceae
27	*Leucaena leucocephala*	Safed babul	Mimosaceae
28	*Magnolia champaka*	Champa	Magnoliaceae
29	*Mangifera indica*	Aam	Anacardiaceae
30	*Mimusops elengi*	Maulsari	Sapotaceae
31	*Melia azedarach*	Bakain	Meliaceae
32	*Moringa oleifera*	Sohanjana	Moringaceae
33	*Morus alba*	Toot	Moraceae
34	*Millingtonia hortensis*	Akas neem	Bignoniaceae
35	*Mitragyna parvifolia*	Phaldu	Rubiaceae
36	*Parkinsonia aculeata*	Ram Babul	Fabaceae
37	*Phoenix sylvestris*	Khazoor	Arecaceae
38	*Pongamia pinnata*	Karanj	Fabaceae
39	*Prosopis juliflora*	Khejri	Fabaceae

Sr. No.	SCIENTIFIC NAME	LOCAL NAME	FAMILY
40	*Prosopis cineraria*	Jand	Fabaceae
41	*Populus deltoides*	Poplar	Salicaceae
42	*Polyalthia longifolia*	Debdaru	Anonnaceae
43	*Putranjiva roxburghii*	Jivanputra	Putranjivaceae
44	*Salix tetrastomatica*	Willow	Salicaceae
45	*Syzygium cumini*	Jamun	Myrtaceae
46	*Tamarindus indica*	Imli	Caesalpiniaceae
47	*Tectona grandis*	Sagun	Verbenaceae
48	*Terminalia arjuna*	Arjun	Combretaceae
49	*Terminalia belerica*	Bahera	Combretaceae
50	*Thevetia peruviana*	Karabi	Apocyanaceae
51	*Ziziphus mauritiana*	Ber	Rhamnaceae
(B) Shrubs and Herbs			
1	*Abutilon indicum*	Kanghi	Malvaceae
2	*Achyranthes aspera*	Chirchita	Amoranthaceae
3	*Adhatoda vasica*	Bansak	Acanthaceae
4	*Aerva tomentosa*	Bui	Amoranthaceae
5	*Agave americana*	Gwarpatha	Amaryllidaceae
6	*Antigonon leptopus*	Coral Vine	Polygonaceae
7	*Boerhaavia diffusa*	Punaruara	Nyctaginaceae
8	*Bougainvillea glabra*	Bougainvellia	Nyctaginaceae
9	*Calotropis procem*	Aak	Asclepiadaceae
10	*Capparis decidua*	Karir	Capparidaceae
11	*Cassia occidentalis*	Kasunda	Caesalpiniaceae
12	*Cassia tora*	Panwar	Caesalpiniaceae
13	*Cleome viscosa*	Bagra	Capparidaceae
14	*Datura metel*	Kala Dhatura	Solanaceae
15	*Datura stramonium*	Dhatura	Solanaceae
16	*Euphobia hirta*	Dudhi	Euphobiaceae
17	*Flacourtia indica*	Bilangada	Leguminosae
18	*Ipomoea fistulosa*	Besharam	Convonvulaceae
19	*Lantana camara*	Panchpuli	Verbenaceae
20	*Opuntia dillenii*	Nagphani	Cactaceae
21	*Polygonum orientale*	Knot Plant	Polygonaceae
22	*Parthenium hysterophorus*	Gajar Ghass	Asteraceae
23	*Ricinus communis*	Arand	Euphorbiaceae
24	*Nerium odorum*	Kaner	Apocyanaceae
25	*Sida acuta*	Kharenti	Malvaceae
26	*Solanum xanthocarpum*	Kateri	Solanaceae
27	*Solanum nigrum*	Makoi	Solanaceae
28	*Solanum surattense*	Kakri	Solaceae
29	*Tribulus terrestris*	Gokhru	Zygophyceae
30	*Vitex negundo*	Bana	Verbenaceae
31	*Urena lobata*	Bachita	Malvaceae
32	*Xanthium strumarium*	chota gokhru	Asteraceae
(C) Grasses, Hedges and Climbers:			
1	*Coccinia cordifolia*	Janglo	Cucurbitaceae
2	*Cuscuta reflexa*	Akash bel	Cosnopulaceae

Sr. No.	SCIENTIFIC NAME	LOCAL NAME	FAMILY
3	*Capparis sepiaria*	Hins	Capparidaceae
4	*Cyperus bulbosus*	Kila	Cyperaceae
5	*Cyperus rotundus*	Dilla	Cyperaceae
6	*Cocculus pendulus*	Vallus	Merispermaceae
7	*Momordica charantia*	Jangli kasula	Cucurbitaceae
8	*Perguleria extensa*	Trotur	Asclepiadaceae
9	*Tinospora cordifolia*	Gilloh	Menispermaceae
10	*Andropogon annulatus*	Gandra	Poaceae
11	*Cenchugus biflorus*	Bhurat	Poaceae
12	*Chrysopogon fulvus*	Dhanlar	Pocaeae
13	*Cymbopogon*	Anjan	Pocaeae
14	*Cynodon dactylon*	Dubesha	Poaceae
15	*Dichanthium*	Talwan	Poaceae
16	*Desmostachys*	Dub	Poaceae
17	*Echinochloa colorium*	China	Poaceae
18	*Erianthus munja*	Kana	Poaceae
19	*Imperata cylindrica*	Siris	Poaceae
20	*Panicum colonum*	Sanuak	Poaceae
21	*Saccharum munja*	Kans	Poaceae
22	*Sporobolus marginalus*	Chiria	Poaceae
23	*Vetiveria zizanoides*	Khas	Poaceae

Source: Study done by PARIVESH ENVIRONMENTAL ENGINEERING SERVICES

Plantation Forestry: As the natural forest area was currently very poor in this district, enormous attempt has been made for raising plantation forestry in government as well as private land either through social forestry programme or by organized strip plantation by the forest department. Over last two decades such attempts were undertaken. Many fast-growing trees, ornamental plants and fruit trees were planted through these programmes. Usually through mass strip plantation programme along the railway line, road, canal bank, drain bank, and even in degraded notified forest land, a considerable volume of wood biomass was expected in this area. Four major plant categories were used for this purpose viz. Shisam, Kikar, Eucalyptus, and other mixed types. In addition, various private land and Panchayat areas were taken up for social forestry programmes. A total of more than twenty-five plant species were regularly utilized for planting in this programme during onset on monsoon period. The details of plant species used in the social forestry programmes are given in the Table 3.24. Among them once again the most prevalent species that are used for these purposes were Kikar, Eucalyptus, Khair, Shisham, Teak and Neem.

Table 3-24: Major Plant Species Used for Social Forestry Plantation

Sr. No.	Common Name	Botanical Name
1.	Babul	*Acacia nilotica*
2.	Safeda	*Eucalyptus cameldulensis*
3.	Khair	*Acacia Senegal*
4.	Aam	*Mangifera indica*
5.	Jungle Saru	*Casuarina equisetifolia*
6.	Gulmohar	*Delonix regia*
7.	Bahera	*Terminalia balerica*
8.	Subabul	*Leucenea leucocephala*
9.	Arjun	*Terminalia arjuna*

Sr. No.	Common Name	Botanical Name
10.	Neem	*Azadirachta indica*
11.	Jamun	*Sizygium cuminii*
12.	Shisham	*Dalbergia sissoo*
13.	Papri	*Holoptelia integrifolia*
14.	Asan	*Terminalia tomentosa*
15.	Kassod	*Cassia siamea*
16.	Amrood	*Psidium guajava*
17.	Teak/Sagwan	*Tectona grandis*
18.	Kachnar	*Bauhinia variegata*
19.	Bakain	*Melia azadirachta*
20.	Poplar	*Populas deltoids*
21.	Khejri	*Prosopis juliflora*
22.	Imli	*Tamarindus indica*
23.	Mull berry	*Morus alba*

Plants of Economic Importance: A good number of plants found in this area having enormous importance as medicine & other allied uses. There are listed in Table 3.25. However, none of the plants can be considered as rare & endangered as suggested by IUCN. There is no wild germplasm stock in the area under survey.

Table 3-25: Plants of Medicinal Importance & Other Allied Uses

Sr. No.	Botanical Name	Local Name	Part Used
1.	*Alstonia scholaris*	Saptparni	Bark
2.	*Azadirachta indica*	Neem	Seed, Leaf, Bark
3.	*Bombax ceiba*	Semal	Fruits
4.	*Butea monosperma*	Palash	Flower. Leaf
5.	*Erythrina arborescens*	Roringe	Flower, Bark
6.	*Moringa oliefera*	Sainjna	Flower, Fruit, Leaf
7.	*Syzygium cumini*	Jamun	Fruit, Bark
8.	*Tamarindus indica*	Imli	Fruit
9.	*Terminalia arjuna*	Arjun	Bark
10.	*Terminalia belerica*	Bahera	Fruit, Bark
11.	*Zizyphus mauritiana*	Ber	Fruit
12.	*Achrantus aspera*	Latjeera	Whole plant
13.	*Adhatoda vasica*	Adusa	Leaf
14.	*Datura metal*	Dhatura	Seeds
15.	*Sida acuta*	Baraira	Whole Plant
16.	*Solanum xanthocarpum*	Kateri	Fruits
17.	*Tribulus terrestris*	Gokhru	Whole plant
18.	*Vitex negundo*	Bana	Leaf
19.	*Vetiveria zizanoides*	Khas	root

Agriculture: Quite a good number of crops were grown in this area. The major crops are paddy, jowar, bajra, makai and sugarcane in kharif seasons, while that of Rabi seasons crops are wheat, barley, sunflower, arahar, mung, chana, masoor, rapeseed, pea and barseem. The average yield rate of paddy and wheat are 20-25 Q/ha and 36-37 Q/ha respectively. The cultivation in this area

is highly mechanized and there are profound facilities for canal and deep tube well irrigation. The farmers also use both chemical and bio-fertilizer in adequate quantity.

Grassland: No prominent grass land ecosystem has been found in core and buffer zone of the project. However, the grass lands were mixed with natural vegetation in lowlands and cultivable waste lands are now being utilized as grazing grounds to the livestock species: Goat, Cow, Ox and Buffalo. The grass species and sedges of core and buffer zone are listed below with the natural vegetation of buffer zone.

Endemic/Endangered Flora: No endangered and endemic flora was recorded from core and buffer zone of the project area.

Location of National Park/Sanctuaries: There is no Bio-sphere Reserve, National Parks, Wildlife Sanctuary, Tiger Reserve and Elephant Reserve within 10 km radius of the project site.

Waste Land: Wasteland has developed in the area where the soil conditions are poor and under high biotic pressure. Places where soil conditions are not appropriate to support plant growth are commonly seen in the area. All such areas are either without any vegetation or are covered with species like Acacia nilotica, Prosopis juliflora, Lantana camara, Calotropis procera, Zyziphus mauritiana, Leonotis nepetifolia, Xanthium straumarium, etc.

3.8.5. Faunal Diversity

To prepare a detailed report on the status of wildlife biodiversity within 10 km radial area to assess the impacts due to the project activity and evolve suitable mitigation measures to protect and conserve wildlife biodiversity following components were studied:

a. Wildlife Survey (Diversity)
b. Habitat Study (Feeding, Breeding and Roosting areas)
c. Distribution/Status of Birds
d. Rare & Endangered species of Fauna
e. Specific local characteristics of biodiversity in the study area.

Methodology for Faunal Diversity: A linear transect of 1.0 km each was chosen for sampling at each site. Each transect was trekked for 1.5 hr for the sampling of faunal diversity through following methods for different categories. For the sampling of butterflies, the standard 'Pollard Walk' method was employed, and all the species recorded daily. Voucher specimens of the species that could not be identified in the field were collected using a butterfly net besides photographing them.

For bird's sampling, 'Point Sampling' along the fixed transect (Foot trails) was carried out. All the species of birds were observed through a binocular and identified with the help of field guidebook and photographs.

For the sampling of mammals, direct count on open width (20m) transect was used. In addition, information on recent sightings/ records of mammals by the villagers/ locals was also collected. For carnivores, indirect sampling was carried out and the mammals were identified by foot marks, faeces and other marks/ sign created by them. In case of reptiles mainly lizards were sampled by direct count on open width transects.

The study of fauna takes substantial amount of time to understand the specific faunal characteristic of area. The assessment of fauna has been done by extensive field survey of the area. During survey, the presence of wildlife was also inhabitants depending on animal sightings

and the frequency of their visits in the project area, which was later confirmed from forest department, Wildlife department etc.

Table 3-26: Faunal Checklist of Buffer Zone

S. No.	English Name	Scientific Name	Status/Schedule
Mammals			
1.	Black Rat	*Rattus rattus*	Schedule-V
2.	Common Mangoose	*Herpestes edwerdsii*	Schedule-II
3.	Five Striped Palm Squirrel	*Funambulus pennanii*	Schedule-IV
4.	Little Indian field mouse	*Mus booduga*	Schedule-V
5.	Indian Hare	*Lepus nigricollis*	Schedule-IV
6.	Monkey	*Maccaca mulata*	Schedule-II
7.	Jackal	*Canis aureus*	Schedule-II
8.	Bat	*Rousettus leschenaultia*	Schedule-V
9.	Common Langur	*Semnopithecus entellus* [LC]	Schedule-II
10.	Common mangoose	*Herpestes edwerdsii*	Schedule-II
Amphibians			
11.	Indian pond frog	*Rana hexadactyla*	Schedule-IV
12.	Common Indian Toad	*Duttaphrynus melanostictus*	Not Listed
13.	Indian Bull Frog	*Hoplobatrachus tigerinus*	Schedule-IV
14.	Indian Skipper Frog	*Euphlyctis cyanophlyctis*	Schedule-IV
15.	Toad	*Bufo bufo*	Not Listed
16.	Indian Cricket Frog	*Rana limnocharis*	Schedule-IV
17.	Common Frog	*Rana tigrina*	Schedule-IV
Reptiles			
18.	House gecko	*Hemidactylus flavivridis*	Common
19.	Common garden lizard	*Calotes versicolor*	Common
20.	Brahminy skink	*Mabuya carinata*	Common
21.	Indian Cobra	*Naja naja*	Schedule-II
22.	Rat Snake	*Ptyas mucosa*	Schedule-IV
23.	Garden Lizard	*Calotes versicolor*	Not Listed
Butterflies			
24.	White, orange tip	*Ixias marianne*	Common
25.	Lime butterfly	*Papilio demoleus*	Common
26.	Common crow	*Euploea core*	Common
27.	Common map	*Cyrestis thyodamas*	Common
28.	Common mormon	*Papilio polytes*	Common
29.	Common Grass Yellow	*Eurema hecabe*	Fairly Common
30.	Stripped Tiger	*Danaus genutia*	Common
31.	Danaid Egg Fly	*Hypolimanas misippus*	Common
32.	Common Bush Brown	*Mycalesis perseus*	Common
Aves			
33.	House Crow	*Corvus splendens*	Schedule-V
34.	Rock Pigeon	*Columba livia*	Common
35.	Jungle babbler	*Turoides striatus*	Schedule-IV
36.	Common Myna	*Acridotheres tristis*	Schedule-IV
37.	Green bee-eater	*Merops orientalis*	Least Concern
38.	Indian roller	*Coracias benshalensis*	Schedule-IV
39.	Black Drongo	*Dicrirus macrocercus*	Schedule-IV
40.	Little cormorant	*Microcarbo niger*	Schedule-IV

S. No.	English Name	Scientific Name	Status/Schedule
41.	Common swift	*Apus apus*	Schedule-IV
42.	House swift	*Apus affinis*	Schedule-IV
43.	Cattle Egret	*Bubulcus ibis*	Schedule-IV
44.	Little Egret	*Egretta garzetta*	Schedule-IV
45.	Pond heron	*Ardeola grayii*	Schedule-IV
46.	Red wattled lapwing	*Vanellus indicus*	Schedule-IV
47.	Ring dove	*Streptopelia decaocto*	Schedule-IV
48.	Spotted Dove	*Streptopelia chinensis*	Schedule-IV
49.	White Breasted Kingfisher	*Halcyon smyrnensis*	Schedule-IV
50.	Blue Cheeked Bee Eater	*Merops persicus*	Schedule-IV
51.	Asian Koel	*Eudynamys scolopacea*	Schedule-IV
52.	Indian Robin	*Saxicoloides fulicata*	Schedule-IV
53.	Pied Bush Chat	*Saxicola caprata*	Schedule-IV
54.	Purple Sun Bird	*Nectarinia asiatica*	Schedule-IV
55.	Small Sun Bird	*Nectarinia minima*	Schedule-IV
56.	House Sparrow	*Passer domesticus*	Schedule-IV
57.	Grey Tit	*Parus major*	Schedule-IV
58.	Red Vented Bulbul	*Pycnonotus cafer*	Schedule-IV
59.	Bank Myna	*Acridotheres ginginianus*	Schedule-IV
60.	Common Babbler	*Turdoides caudatus*	Schedule-IV
61.	Tailor Bird	*Orthotomus sutorius*	Schedule-IV
62.	Rose Ringed Parakeet	*Psittacula krameri*	Schedule-IV
63.	Baya	*Ploceus philippinus*	Schedule-IV
64.	Owl	*Bubo bubo*	Schedule-IV
65.	Black Ibis	*Pseudibis papillosa*	Schedule-IV
66.	Whistling duck	*Dendrocygna javanica*	Schedule-IV
67.	Pea fowl	*Pavo cristatus*	**Schedule-I**
68.	Titar	*Ortygornis pondicerianus*	Schedule-IV
69.	Bater	*Coturnix coturnix*	Schedule-IV

Endangered Species: 69 species of vertebrates could be seen in the vicinity of the proposed project. Only one Schedule I i.e., Pavo cristates, under Wildlife Protection Act, 1972, have been reported from the study area. Conservation plan have been prepared for schedule I species and enclosed as **Annex 3.3**. Although these are very common species and found in every locality, even in villages, certain steps should be taken to conserve the critical wildlife:

a) Programs for the conservation of wildlife will be formulated and implemented outside the protected areas by educating the local communities with help of local public agencies, and other stakeholders including the environment division officers of our company, to reduce the scope of man-animal conflict.
b) It will be ensured that human activities on the fringe of the protected areas do not degrade the habitat.

Overall, the status of wildlife in a region is an accurate index of the state of ecological resources, and thus, of the natural resources base of human well-being. This indicates the interdependent nature of ecological entities (the web of life), in which wildlife is a vital link and a base of eco-tourism. Thus, the importance of conserving and protecting wildlife will be spread among the local people.

3.8.6. Aquatic Ecology

There are several canals and drains connected with river Yamuna. Aquatic biotic communities like Phytoplankton and Zooplanktons, Macrophytes and Fishes were studied.

Methodology for Aquatic Diversity: The samples for qualitative and quantitative analysis of planktons were collected from the sub surface layer at knee depth. Water samples were filtered through plankton net of 20µ mesh size (APHA, 1971). The filtered samples were concentrated by using the centrifuge. By using Lackey's drops method and light microscope (Lackey, 1938), the qualitative analysis was carried out for phytoplankton and zooplankton. The standard flora and other literature were followed for the qualitative evaluation of Plankton.

Macrophytes: For studies on macrophytes, marsh areas, canal and drains, water bodies of different size were surveyed within the radius of about 10 km from the proposed site. A check list of macrophytes is given in the Table 3.27. Among them water hyacinth, duckweed and hogla plants were most common.

Table 3-27: Checklists of Macrophytes in Aquatic Habitats

Sr. No.	Common Name	Scientific Name	Growth Form
1.	Water hyacinth	*Eichornea crassipes*	Floating
2.	Duck weed	*Lemna minor*	Floating
3.	Patera	*Typha domingensis*	Emergent
4.	Kalmi Saag	*Imomea aquatica*	Floating
5.	Garundi	*A lternanthera sessilis*	Floating
6.	Sedges	*Cyperus difformis*	Emergent
7.	Oriental Pepper	*Polygonum orientale*	Amphibious
8.	Barnyard Grass	*Echinochloa glabrescens*	Amphibious
9.	Jal kumbhi	*Pistia stratiotes*	Floating
10.	Lotus	*Nymphea nancheli*	Emergent

Phytoplankton: Following sites were selected for plankton analysis. These are given below.

Table 3-28: Selected Sites for Phytoplankton

Sites Name	Distance	Direction
Yamuna River	-	-
Amrauli Minor Canal	4.5 km	WSW
Hasanpur Distributary Canal	3.2 km	WSW
Left Bata drain	5.2 km	WNW
Bela Minor	7.7 km	WSW
Hodal Distributary Canal	8.9 km	WSW
Ladiyaka Minor	7.7 km	WSW
Silauthi Minor	12.7 km	WNW
Nandabara Minor	5.2 km	NW
Rampur Distributary	13.3 km	NNW
Kithwari Drain	13.5 km	NW
Rasulpur Minor	9.6 km	NW

The detail of plank-tonic diversities is given below.

Table 3-29: List of Phytoplankton & Zooplanktons from Study Area

Phytoplankton	Zooplanktons
Achnanthes sp.	*Arcella sp.*
Ankistrodesmus sp	*Keratella sp.*

Phytoplankton	Zooplanktons
Ceratium sp	*Asplancha sp.*
Euglena sp.	*Brachonus sp.*
Melosira sp.	*Daphnia sp.*
Microcystis sp.	*Cyclops sp.*
Navicula sp.	*Cypris sp.*
Nitzschia sp.	**ROTIFERA**
Oscilaltoria sp.	*Asplanchna intermedia*
Pediastrum sp.	*Brachionus falcatus*
Pinnularia sp.	*Filinia longiseta*
Pleurosigma sp.	*Keratella tropica*
Scenedesmus sp	
Spirulina sp.	
Volvox sp.	

Fishes: A total of species of fishes were recorded as exists in different types of water bodies in the study area. The pisciculture activities were restricted only in the Yamuna River, canals, and village ponds. The culture fisheries were common practices in the confined water bodies over the years. Transported fish seeds core supplied by State Fisheries Department to the villagers and commercial entrepreneurs for pisciculture in confined water bodies. The yield rate is high. The major carps like Rahu (Labeo rohita), Catla (Catla catla), Mrigal (Cirrhina mrigala) and Cyprinus carp (Cyprinus carpio) were primarily cultured.

With respect to capture fisheries, a good number of fishes were reported to be captured from rivers and canal system in particulars. The major fishes were species of Mystus, Channa, Silonia, Rita and Puntius etc.

Among the fishes, four common carps are cultured in village ponds and canals, white both carps and other catfishes were found in the rivers and canal system.

3.9. Socioeconomic Environment

Socio-economic environment is an essential part of environmental study which incorporates various facts related to socio-economic conditions in the area and deals with the total environment. Socio-economic study includes demographic structure of the area, provision of basic amenities viz. housing education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature of aesthetic significance such as temples, historical monuments etc. at the baseline level. This would help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

Socio-economic study of an area provides a good opportunity to assess the socioeconomic conditions of an area. This study will possibly estimate the change in living and social standards of the area benefitted due to the project. The gross economic production of the area will be increased substantially due to the existence of this project. It can undoubtedly be said that this plant will provide direct and indirect employment and improve the infrastructural facilities and living standards of the area.

3.9.1. Census & Demographic Status of Palwal District

An official Census 2011 detail of Palwal, a district of Haryana has been released by Directorate of Census Operations in Haryana. Enumeration of key persons was also done by census officials in Palwal District of Haryana.

In 2011, Palwal had population of 1,042,708 of which male and female were 554,497 and 488,211 respectively. In 2001 census, Palwal had a population of 829,121 of which males were 445,390 and remaining 383,731 were females. Palwal District population constituted 4.11 percent of total Maharashtra population. In 2001 census, this figure for Palwal District was at 3.92 percent of Maharashtra population.

There was change of 25.76 percent in the population compared to population as per 2001. In the previous census of India 2001, Palwal District recorded increase of 34.21 percent to its population compared to 1991.

Table 3-30: Palwal District Population

Description	2011	2001
Population	10.43 Lakhs	8.29 Lakhs
Actual Population	10,42,708	8,29,121
Male	5,54,497	4,45,390
Female	4,88,211	3,83,731
Population Growth	25.76%	34.21%
Area Sq. Km	1,359	1,367
Density/km2	767	607
Proportion to Haryana Population	4.11%	3.92%
Sex Ratio (Per 1000)	880	862
Child Sex Ratio (0-6 Age)	866	853
Average Literacy	69.32	59.2
Male Literacy	82.66	75.1
Female Literacy	54.23	40.8
Total Child Population (0-6 Age)	1,77,494	2,06,778
Child Proportion (0-6 Age)	17.02%	24.94%

Palwal Literacy Rate: Average literacy rate of Palwal in 2011 were 69.32 compared to 69.32 of 2001. If things are looked out at gender wise, male, and female literacy were 82.66 and 54.23 respectively. For 2001 census, same figures stood at 75.10 and 40.80 in Palwal District. Total literate in Palwal District were 599,796 of which male and female were 379,696 and 220,100 respectively. In 2001, Palwal District had 250,361 in its district.

Palwal Sex Ratio: With regards to Sex Ratio in Palwal, it stood at 880 per 1000 male compared to 2001 census figure of 862. The average national sex ratio in India is 940 as per latest reports of Census 2011 Directorate. In 2011 census, child sex ratio is 866 girls per 1000 boys compared to figure of 853 girls per 1000 boys of 2001 census data.

Palwal Child Population: In census enumeration, data regarding child under 0-6 age were also collected for all districts including Palwal. There was total 177,494 children under-age of 0-6 against 206,778 of 2001 census. Of total 177,494 male and female were 95,132 and 82,362 respectively. Child Sex Ratio as per census 2011 was 866 compared to 853 of census 2001. In 2011, Children under 0-6 formed 17.02 percent of Palwal District compared to 24.94 percent of 2001. There was net change of -7.92 percent in this compared to previous census of India.

Palwal Houseless Data: In 2011, total 306 families live on footpath or without any roof cover in Palwal district of Haryana. Total Population of all who lived without roof at the time of Census 2011 numbers to 1,481. This approx. 0.14% of total population of Palwal district.

Palwal District Density: The initial provisional data released by census India 2011, shows that density of Palwal district for 2011 is 767 people per sq. km. In 2001, Palwal district density was at 607 people per sq. km. Palwal district administers 1,359 square kilometres of areas.

Palwal District Urban/Rural 2011: Out of the total Palwal population for 2011 census, 22.69 percent lives in urban regions of district. In total 236,544 people lives in urban areas of which males are 125,590 and females are 110,954. Sex Ratio in urban region of Palwal district is 883 as per 2011 census data. Similarly, child sex ratio in Palwal district was 830 in 2011 census. Child population (0-6) in urban region was 33,728 of which males and females were 18,427 and 15,301. This child population figure of Palwal district is 14.67 % of total urban population. Average literacy rate in Palwal district as per census 2011 is 77.81 % of which males and females are 86.16 % and 68.45 % literates respectively. In actual number 157,811 people are literate in urban region of which males and females are 92,336 and 65,475 respectively.

As per 2011 census, 77.31 % population of Palwal districts lives in rural areas of villages. The total Palwal district population living in rural areas is 806,164 of which males and females are 428,907 and 377,257 respectively. In rural areas of Palwal district, sex ratio is 880 females per 1000 males. If child sex ratio data of Palwal district is considered, figure is 874 girls per 1000 boys. Child population in the age 0-6 is 143,766 in rural areas of which males were 76,705 and females were 67,061. The child population comprises 17.88 % of total rural population of Palwal district. Literacy rate in rural areas of Palwal district is 66.72 % as per census data 2011. Gender wise, male, and female literacy stood at 81.59 and 49.85 percent respectively. In total, 441,985 people were literate of which males and females were 287,360 and 154,625 respectively.

All details regarding Palwal District have been processed by us after receiving from Govt. of India. We are not responsible for errors to population census details of Palwal District.

Table 3-31: Palwal District Demography

Description	Rural	Urban
Population (%)	77.31%	22.69%
Total Population	8,06,164	2,36,544
Male Population	4,28,907	1,25,590
Female Population	3,77,257	1,10,954
Sex Ratio	880	883
Child Sex Ratio (0-6)	874	830
Child Population (0-6)	1,43,766	33,728
Male Child (0-6)	76,705	18,427
Female Child (0-6)	67,061	15,301
Child Percentage (0-6)	17.83%	14.26%
Male Child Percentage	17.88%	14.67%
Female Child Percentage	17.78%	13.79%
Literates	4,41,985	1,57,811
Male Literates	2,87,360	92,336
Female Literates	1,54,625	65,475
Average Literacy	66.72%	77.81%
Male Literacy	81.59%	86.16%
Female Literacy	49.85%	68.45%

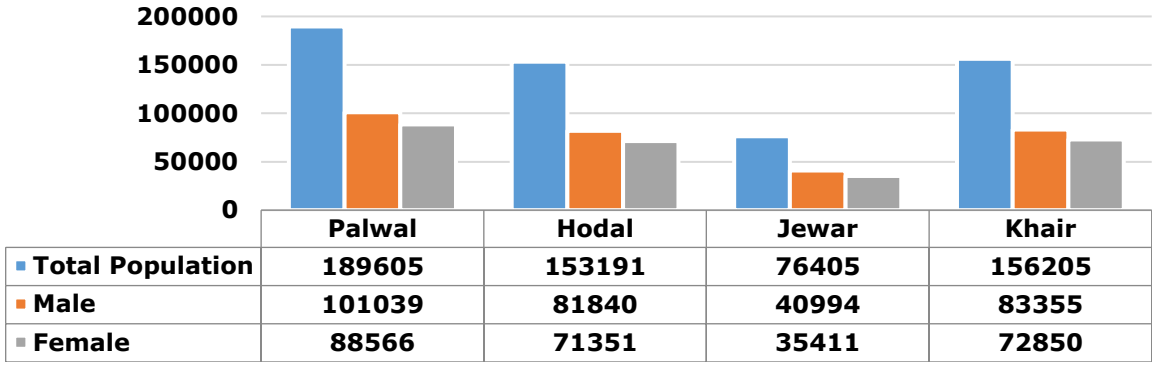
3.9.2. Demography of Study Area

Study area is following 2 states namely, Uttar Pradesh and Haryana. Two districts & Four blocks are coming in study area namely Palwal, Hodal of Palwal District & Jewar of Gautam Budhha Nagar & Khair of Aligarh District. Demography of the study area is given in table below.

Table 3-32: Demographic Structure of the Study Area

S. No.	State	Name of District	Name of the Block	Household	Total Population	Male	Female	Population 0-6 Years	HH Size	Gender Ratio
1	Haryana	Palwal	Palwal	31427	189605	101039	88566	30799	6.0	877
2			Hodal	25144	153191	81840	71351	25483	6.1	872
3	Uttar Pradesh	Gautam Budh Nagar	Jewar	12419	76405	40994	35411	12154	6.2	864
4		Aligarh	Khair	25806	156205	83355	72850	25401	6.1	874
Total				**94796**	**575406**	**307228**	**268178**	**93837**	**6.1**	**872**

Figure 3.15: Population & Gender Ration of Study Area



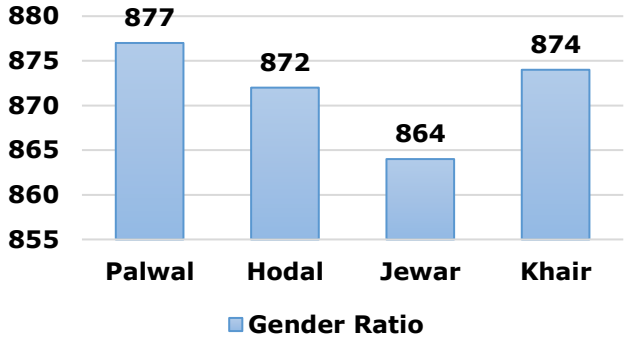


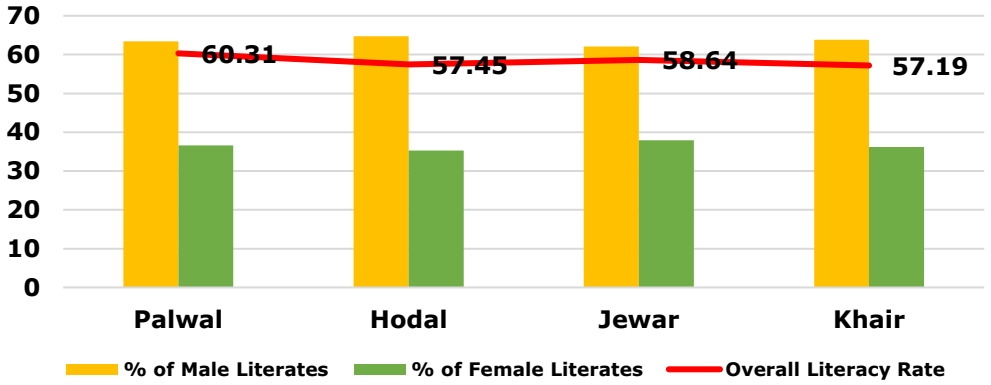
Table 3-33: Population Distribution of the Study Area

S. No.	State	Name of District	Name of the Block	Household	Population						
					Total	SC Total	SC Male	SC Female	ST Total	ST Male	ST Female
1	Haryana	Palwal	Palwal	31427	189605	44844	23728	21116	0	0	0
2			Hodal	25144	153191	35528	18938	16590	0	0	0
3	Uttar Pradesh	G.B. Nagar	Jewar	12419	76405	17806	9531	8275	0	0	0
4		Aligarh	Khair	25806	156205	38796	20642	18154	0	0	0
Total				**94796**	**575406**	**136974**	**72839**	**64135**	**0**	**0**	**0**

Table 3-34: Literacy Rate of the Study Area

S. No.	State	Name of District	Name of the Block	Total Population	Total Literates	Literacy Rate				
						Male	%	Female	%	Overall
1	Haryana	Palwal	Palwal	189605	114350	72459	63.37	41891	36.63	60.31
2			Hodal	153191	88009	56938	64.7	31071	35.3	57.45
3	Uttar Pradesh	Gautam Budh Nagar	Jewar	76405	44803	27829	62.11	16974	37.89	58.64
4		Aligarh	Khair	156205	89331	56971	63.78	32360	36.22	57.19
Total				**575406**	**336493**	**214197**	**63.49**	**122296**	**36.51**	**58.40**

Figure 3.16: Literacy Rate & Worker Status of Study Area



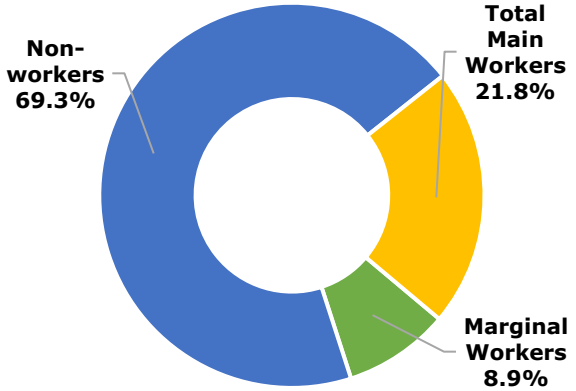


Table 3-35: Occupational Structure of the Study Area

Sl. No.	State	Name of District	Name of the Block	Total Population	Total Main Workers	Main Workers				Marginal Workers	Non-workers
						Cultivators	Agricultural labours	Household labours	Other Workers		
1	Haryana	Palwal	Palwal	189605	39771	16014	6030	1177	16550	17809	132025
2			Hodal	153191	31385	13765	4532	638	12450	13912	107894
3	Uttar Pradesh	Gautam Budh Nagar	Jewar	76405	17797	5180	3023	1328	8266	7021	51587
4		Aligarh	Khair	156205	36330	17103	7851	1342	10034	12573	107302
Total				**575406**	**125283**	**52062**	**21436**	**4485**	**47300**	**51315**	**398808**

Table 3-36: Education and Medical Facilities of the Study Area

S. No.	State	Name of District	Block	Govt. School				Health Center			
				Primary	Middle	Secondary	Senior Secondary	CHC	PHC	PHSC	MCWC
1	Haryana	Palwal	Palwal	73	43	18	10	0	4	20	0
2			Hodal	38	31	20	10	1	0	14	0
3	Uttar Pradesh	Gautam Budh Nagar	Jewar	22	11	1	1	1	1	6	3
4		Aligarh	Khair	49	33	9	6	1	1	1	5
Total				**182**	**118**	**48**	**27**	**3**	**6**	**41**	**8**

CHC- Community Health Center, PHC- Primary Health Center, PHSC-Primary Health Sub-center, MCWC-Maternity Child Welfare Centre

Table 3-37: Drinking Water Facilities in the Study Area

S. No.	State	Name of District	Name of the Block	Tap Water	Untreated Tap Water	Covered Well Water (CW)	Hand Pump (HP)	Tube-well (TW)
1	Haryana	Palwal	Palwal	65	46	9	60	62
2			Hodal	35	10	2	32	34
3	Uttar Pradesh	Gautam Budh Nagar	Jewar	14	13	0	23	9
4		Aligarh	Khair	17	18	4	51	22
Total				**131**	**87**	**15**	**166**	**127**

Source Census Data, 2011

3.10. Conclusion

This is the sand mining case and the adverse impacts as no drilling, blasting is proposed. The baseline status of the project site is good as maximum area is agricultural land. No other source of emission identified in the region.

CHAPTER – 04

ANTICIPATED ENVIRONMENTAL IMPACTS ASSESSMENT & MITIGATION MEASURES

4. Anticipated Environmental Impacts & Mitigation Measures

4.1. General

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

"Environmental Impact" can be defined as any alternation of base line environmental conditions or creation of a new set of environmental conditions, adverse or beneficial, caused or induced by the action or set of proposed actions under consideration. Opencast mining activities cause adverse impacts on the surrounding environment unless proper environmental management plan is adopted. Selecting suitable sites for mining and adopting all the guidelines prescribed by the Ministry of Environment and Forests & Climate Change (MoEF&CC) and Indian Bureau of Mines (IBM) can minimize the major possible impacts.

4.2. Impact Assessment

It summarizes the pollution potential of the proposed open cast mine, its possible impact on the surrounding environment and the necessary management actions proposed for control and abatement of pollution. The environmental components that are likely to be influenced are illustrated below in Table 4.1.

Table 4-1: Types of Impact due to Mining Activity

S. No.	Activities	Description of impacts
1	Vegetation	Moderate damage: uprooted plants, damaged to plant parts such as branches, loss of tree species, disturbances to survival, habitat loss
2	Animals	Moderate damage: loss of aquatic habitats (specially for fish and phytoplankton), decreased species diversity due to loss of sensitive species, loss of spawning grounds for aquatic species and riverbank dwelling species, disturbances to food webs, habitat loss for bank dwelling species such as aquatic birds, reptiles, amphibians.
3	Ecosystem stability	Moderate damage: soil erosion, loss of fertile soil, bank instability and collapse, loss of protective structures provided by trees, changes to topography due to temporary foot paths and transportation network, obstacles to water flow
4	Water quality	Pollution by sedimentation, silt loads, vehicular discharge, solid waste dumping by humans, visible impairment of water quality, decreased dissolved oxygen concentration

4.3. Identification of Impacts

During the working life of mine, air, water, noise, and land use are likely to be affected due to minerals and associated activities. Positive impacts on socio-economic environment are expected due to creation of employment opportunities and development of infrastructure such as roads, schools, hospitals etc. The identification matrix indicates interrelationship between activities causing impact (columns) and aspects getting impacted (rows). The significant impacts are marked as (√) for beneficial impacts and as (•) for adverse impacts. Any detailed assessment shall be done only for the significant impacts. The matrix will assist in identifying significant impacts as Table 4.2.

Table 4-2: Impact Identification Matrix

Aspects Impacted Attributes	Site		Ancillary / Activity Area					Post Operation	
	Site Clearance	Operation (Opencast)	Transportation	Mineral Storage	Water Discharge	Greenbelt Development	Employment	Urbanization (Buffer)	Transportation
Ambient Air		•	•	•		√			
Water Resource		•							
Water Quality		•		•	•				
Ambient Noise		•	•			√			
Vibration			•						
Flora and Fauna		•				√			
Soil / Land-use	•	•		•		√			
Infrastructure		•	√					√	√
Traffic			•						
Health & Safety		•		•					
Socio-economic		•					√	√	√

•***Adverse Impact*** √ ***Beneficial Impacts***

4.4. Impacts on Land-use and Mitigation Measures

This is the sandmining project from riverbed of river Yamuna. The project area does not consist of any forest land. It does not consist of any human habitations. Land-use plan of the mining lease area during pre-operation, operation and post-operational is incorporated in the Chapter 2 (Table 2-10).

4.4.1. Identified Impact on Land-Use

The mining activity in the mine site will be converted into the pit which will be replenished during monsoon season each year. No pit will remain on site. Detailed replenishment plan will be prepared, and approval will be obtained from concerned department.

4.4.2. Mitigation Measures for Impacts on Land-Use

There will be no change in land-use as the mined-out area will be replenished by river in monsoon period. Fencing will be done around the lease area and ancillary area. Total mining area is 25.06 ha, out of total lease area, 25.02 ha will be mined-out and remaining 5.04 ha area will be restricted zone for mining. A suitable combination of trees (total 7900) that can grow fast and have good leaf cover to contain dust pollution shall be adopted to develop greenbelt. Greenbelt

development will be done wherever possible as riverbanks, bunds, and transportation route. Plantation will be done within first 2 years and in later years maintenance will be ensured. The gap plants also will be ensured to complete the numbers of total plants.

4.4.3. Conclusion

There will be no change in land-use in mining lease area. The mined-out area will be replenished each year during monsoon period so no pit will be available on site. For the safety reasons, bunds will be developed in 5.04 area which is safety / restricted zone. Plantation will be done on riverbanks both side and haul road / transportation road in first two years and will be ensured the growth of each sapling 100% in 3rd year. In later year plantation will be maintained.

4.5. Impact on Ambient Air Quality

4.5.1. Identified Anticipated Impact on Ambient Air Quality

The quarry lease area is presently free from pollution. No drilling or blasting will be required as this is sand mining project. Due to small scale quarry operation, it will not affect the immediate vicinity of the mine lease area. The mining method will be opencast manual and small in nature, and there is no proposal for deployment of machinery, which create dust, noise, or air pollution. The approach road of the lease area will be prepared by sand & boulders and tar road are very near to the site, so no question arises of pollution due to surface transportation. Per day trips of trucks are 160 trips in a day. Therefore, no significant impact on the quality of air in the surrounding area.

In sand mining the different process of handling, transportation, and storage of line in the mining activities are prone to generation of high levels of fugitive dust that may increase the levels of PM10 and SPM to high extent. The probable sources of pollution due to mining activities are shown in Table 4.3.

Table 4-3: Predominant Source of Air Pollution

S. No.	Source	Type of Pollutant
1	Mining activity (loading/unloading)	PM_{10}, PM
2	Transport of overburden or soil for dumping/ backfill and mining mineral to sorting/sizing	PM_{10}, PM
3	Dumping of waste	PM_{10}, PM
4	Sorting of mining mineral and loading	PM_{10}, PM
5	Transportation of sorted mining mineral	PM_{10}, SPM, SO_2, NO_x, CO

The effects of air pollutants upon receptors are influenced by concentrations of pollutants and their dispersion in the atmosphere. Air quality modelling 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. The efficient management of air quality requires the use of modelling techniques to analyze the patterns of pollutant concentrations from many individual sources of air pollutants operating simultaneously. The main impacts of air pollutants on the health of human and others are given Table 4.4.

Table 4-4: Identified Impacts of Air Pollutions on Human, Animals and Plants

S. No.	Pollutant	Impact on human health, habitats, and species
1	Particulate matter	PM_{10} can penetrate deep into the lung and cause more damage, while larger particles are typically filtered out through the airways' natural mechanisms. Particulates can damage surfaces and materials.
2	Sulphur dioxide (SO_2)	SO_2 can cause coughing, make people more prone to respiratory infections, and aggravate asthma and chronic bronchitis. SO_2 can attach itself to particles and, if these particles are inhaled, they can cause more serious health effects. Acid rain acidifies soils and water. This can affect aquatic life, cause deforestation, and alter the species composition of plant and animal communities. Acid rain can corrode building materials and paints.
3	Oxides of Nitrogen (NO_x)	NO_x can increase a person's susceptibility to, and the severity of, respiratory infections and asthma. Long-term exposure to high levels of NO_x can cause chronic lung disease. High NO_x levels damage foliage, decrease plant growth, and reduce crop yield. Deposition of nitrogen compounds can lead to soil and water acidification. NO_x can cause eutrophication of soils and water, which alters the species composition of plant communities and can eliminate sensitive species. NO_x is a component of photochemical smog.
4	Carbon monoxide (CO)	When inhaled by people and animals, CO bonds to the haemoglobin in the blood, and reduces the oxygen carrying capacity of the red blood cells. The resulting lack of oxygen in the body causes cells to die.

4.5.2. Impact Assessment on Air Quality due to Operation

Information on air quality was studied and various modelling techniques predicted that the mining activity is not likely to affect the air quality in a significant manner. However, loading of sand, its transportation and unloading operations may cause some deterioration in air quality in terms of fugitive dust from unpaved roads and vehicular emission. In the present case, only wet materials will be handled, thus eliminating problems of fugitive dust due to handling of the materials. Also, the collection and lifting of minerals will be done by open cast manual method without any blasting. Therefore, the dust generated is likely to be insignificant as the processes involving loading/unloading and transportation etc.

4.5.3. Air Dispersion Modelling

In case of riverbed sand mining, as there is no blasting and drilling activities, wet sand handling will limit the impacts only to fugitive dust by transportation on unpaved road and vehicular emission. The distance of unpaved road for project is limited up to the connectivity of nearest major road. The major road will not produce fugitive dust. Therefore, in case of pucca road modelling was carried out for emission likely due to vehicular transportation. The impact due vehicular transportation was assessed by two modelling practices namely fugitive dust modelling and Caline 4 for fugitive dust and vehicular emission respectively.

4.5.3.1. Fugitive Dust- Modelling

The model has been run for assessment of fugitive dust emission likely from transportation at kutcha road. Air quality modelling was done using line source model as published by USEPA "Workbook of Dispersion Modelling" by Turner, for transportation though roads and the empirical emission factor equations from USEPA. Emission factors to be used in Line source Dispersion equation is adopted from formula as given below and block wise emission rate are given in as Table:

$E = k * (1.7) * (s/12) * (S/48) * (W/2.7)^{0.7} * (w/4)^{0.5} * (365-p/365)$ kg/VKT--------- (1)

where,

E = Emission Rate (kg/VKT)
k = Particle size multiplier
s = Silt Content of the Road surface material
S = Mean Vehicle Speed (km/hr)
W =Mean Vehicle Weight (tons)
w = Mean number of wheels
P = Number of days with at least 0.254 mm of precipitation per year
f = frequency of Vehicle movement in no per hour

Thus, using equation (1):

Table 4-5: Emission Rate Estimation

Block Details	Emission Rate in kg/VKT	Emission Rate in g/sec/m
Sultanpur Block	1.4461	0.0014

Concentration of the fugitive dust was calculated using the empirical equations for unpaved roads published by USEPA- AP42. For this, wind speed is assumed 1.6 m/s and height of source is o m. Modelling was done for an infinite line source assuming unpaved road. For conservative calculation wind was assumed to blow at a velocity of 1 m/s perpendicular to the road. The results for 24 hourly concentration values are given in the below Figure 4.2 & 4.2.

Figure 4.1: Concentration of Fugitive Dust v/s Distance (Uncontrolled)

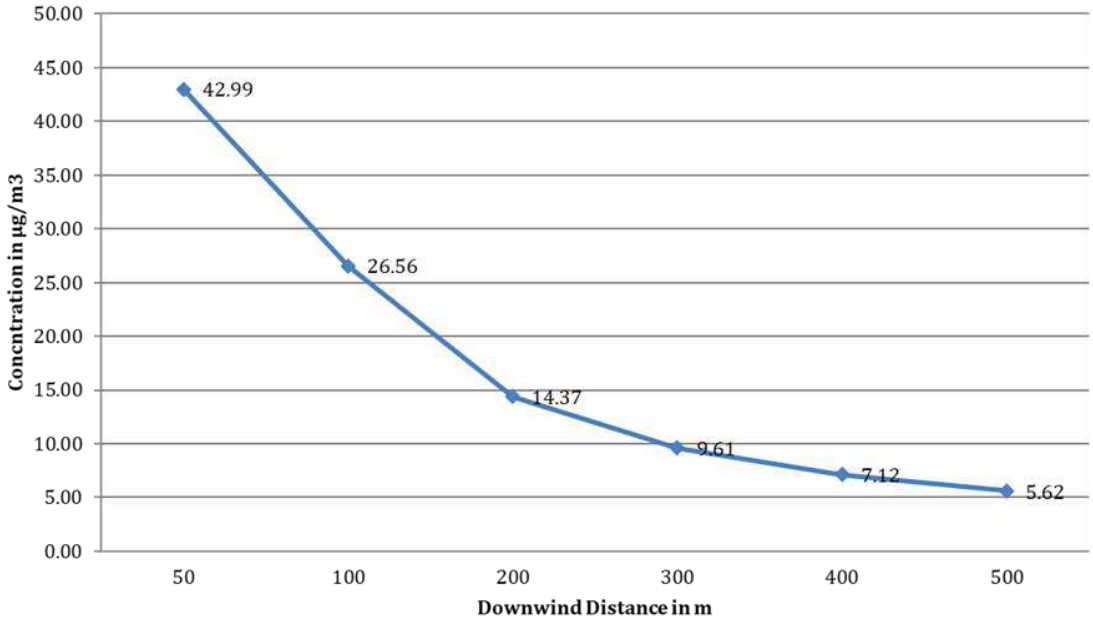
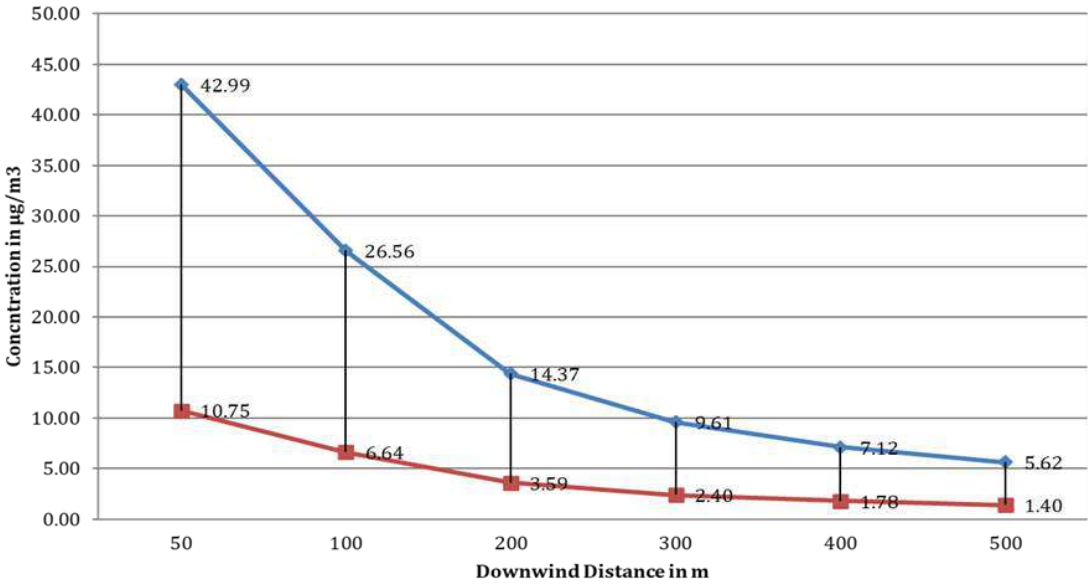


Figure 4.2: Concentration of Fugitive Dust v/s Distance (Controlled)



The details of concentration in respect of distance are given below table.

Table 4-6: Concentration in respect of distance

Concentration	Distance x in m	24 hr avg. concentration in respect of distance	
		Un-controlled	Controlled
Concentration; C in µg/m^3	50	42.99	10.75
	100	26.56	6.64
	200	14.37	3.59
	300	9.61	2.40
	400	7.12	1.78
	500	5.62	1.40

It is observed that the ground level concentration (GLC) decreases from 42.99 µg/m^3 at 50 m from the center line of the road to 5.62 µg/m^3 at 500 m for proposed mining lease with un-controlled way and 10.75 at 500 m to 1.40 µg/m^3 at 50 m from the center line of the road with controlled way respectively. These values have been predicted for a dry unpaved road.

The model prediction has been made for unpaved road. The distance of unpaved road from the proposed block is approx. 500 to 1.0 km. After that Pucca Road (Highway) is available. Hence, no fugitive emission will take place after this point. The distance of nearest settlement is about 1.0 km from the mine lease area. Most of the fugitive dust will get settled at this distance due to specific settling velocity of the particles. Also, the regular water sprinkling will reduce the dust drastically. However, most of the roads in the region are pucca road.

4.5.3.2. Mitigation measures

The only air pollution sources are the road transport network of the trucks/dumpers. The dust suppression measures like the following will be resorted:

- ✓ Water sprinkling will be done on the roads regularly. This will reduce dust emission further by 70-80%.
- ✓ Care will be taken to prevent spillage by covering the carrying vehicles with tarpaulin and sprinkling of water, if dry.

- ✓ Fortnightly scraping of road to keep the roads almost leveled. This will ensure smooth flow of vehicles and prevent spillage.
- ✓ Overloading will be kept under check by giving prior awareness.
- ✓ Proper Tuning of vehicles to keep the gas emissions under check.
- ✓ Plantation of trees along roads sides to help reduce the impact of dust in the nearby villages.

4.5.3.3. Vehicular Load Emission using Caline 4

The Caline 4 Model has been deployed to assess the emission load likely due to transportation of minerals in trucks. Modeling for the project has been done for taking comprehensive approach including the entire vehicular load expected from other mines on the same side. There are five block mines located in the river and likely to use the same highway / road for transportation of mined out minerals to sell.

Emission Rate: The details of emission rate considered for the project are as follows.

Table 4-7: Vehicle Emission Statement

Mine	Category of Vehicles	Expected No. of Vehicles/hr	Emission Rate (g/km)			
			PM*	SO_2#	NO_x*	CO*
Sultanpur Mines	Truck	36	1.24	0.0028	9.30	6.0

- Emission Factor development for Indian Vehicles, ARAI Pune, #- The SO2 emission has been calculated based on Diesel Consumption

4.5.3.4. Model Assumption

The emission load has been evaluated by Caline 4 for Vehicular Movement. The average meteorological data of post-monsoon season (October to December 2022) was considered as met input for model study. CALINE 4 dispersion model software was run by using data on link geometry, traffic volume and environmental receptors given in the table above. The output results at various distances from the road are presented in Table below.

Table 4-8: Incremental Pollution due to Vehicular Transportation

Distance from the Road (m)	Incremental GLCs (µg/m³)			
	PM	SO_2	NO_x	CO
20	4.2	0.5	0.35	3.3
50	2.1	0.4	0.24	2.6
100	1.1	0.4	0.18	2.3
150	0.8	0.3	0.15	2.2
200	0.6	0.2	0.12	2.2

4.5.4. Mitigation Measures for Air Pollution

Mitigative measures suggested for air pollution controls are based on the baseline ambient air quality of the area. The impact with mitigation measures is given in below.

Table 4-9: Impacts of Air Pollution and Mitigation Measures

Attributes	Impact	Mitigation Measure
Human	It is evident from the above table the impact due to vehicular movement shall get almost normalized at approx. 100 on either side of transporting road. Approx 1.1 (µg/m³) will be add on to existing baseline conditions.	❖ Only PUC Certified vehicles shall be deployed for the project. ❖ Regular maintenance check will be conducted for the vehicles.

Attributes	Impact	Mitigation Measure
Animal	No Impact as it is part of riverbed.	❖ Traffic management plan will help in avoiding any traffic jams. ❖ Plantation of trees along roads sides (proposed road for transportation) as part of social forestry to help reduce the impact of fugitive dust in the nearby villages.
Plant	Stomatal index may be minimized due to dust deposit on leaf.	
Crops	Crop yield will be affected.	
Infrastructure	There is no major impact on infrastructure due this sandmining operation.	

4.5.5. Biological Method for Dust Control

Trees can act as efficient filters. The systematic and planned greenbelt development not only reduces the fugitive dust but also checks soil erosion and improves the aesthetic beauty of an area. It is essential that planning for greenbelt development should be done at the inception. It is a proven technology for waste dump stabilization and restoration of mined out areas. But at the end of conceptual stage no dump will be available as waste generation is only 5% of total production which will be utilized for road maintenance and bench preparation. So, the plantation will be done along with haul road, safety zone & nearby panchayat govt. land with consultation of local administration and concerned authorities.

Green belt of adequate width should be raised by planting native species around the mine lease area on both sides of haul road, near material handling plant, on external overburden dumps and backfilled quarry along undisturbed area.

4.5.6. Conclusion

In this mining project, the only source of emission of air pollution is excavation, transportation, loading, hauling operation of minor mineral stone etc. The proposed mining operations are not anticipated to raise the concentration of the pollutions beyond prescribed limits. However, the measures are suggested to mitigate any harmful impacts of pollutants like plantation of trees along haul roads, especially near settlements, to help to reduce the impact of dust on the nearby villages, planning transportation routes of mined material to reach the nearest paved roads by shortest route (minimize transportation over unpaved road); regular water sprinkling on unpaved roads to avoid dust generation during transportation etc.

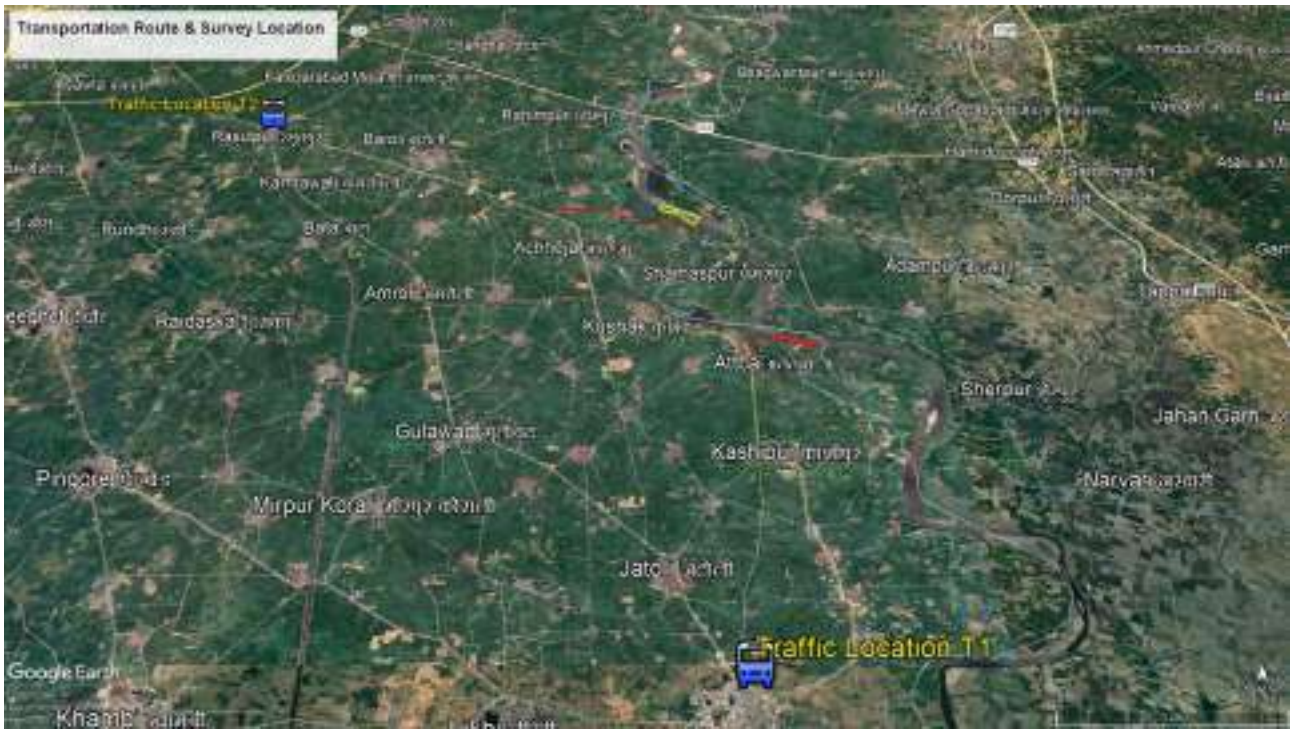
4.6. Impact on Road due to Traffic Movement

4.6.1. Traffic Projection after Implementation of Mining Project

The extent of these impacts, at any given time, depends upon (i) the rate of vehicular emission within a given stretch of the road and (ii) the prevailing meteorological conditions. The impacts have strong temporal dependence as both factors vary with time. The temporal dependence would have diurnal, seasonal as well as long term components.

During proposed mining, there will be an increase in traffic flow as two locations were identified for traffic survey location as one was in Baroli (Near Hasanpur Village which connect to NH 19) & other was on Hasanpur (Near Rasulpur Choraha which connect to Eastern Peripheral Exp.). Area is having the very less traffic as only PUCs and couple of busses (Palwal to Hasanpur) was identified. Traffic survey location is marked in Figure 4.3.

Figure 4.3: Transportation Route & Survey Location



During the study period, traffic survey was done for one day i.e., 12 hours (8.0 AM to 8.0 PM) with 15-minute intervals at one location which is near to the project site which is connected to the project. The Average Annual Daily Traffic (AADT) and PCUs at sampling location is given in Table 4.10.

Table 4-10: Details of Average Annual Daily Traffic (AADT) and PCUs

Location	Distance (km)	Direction	Bus/ Trucks		Passenger cars		3 wheelers		2 wheelers		LCV		Truck-Trailer/ Tractor		Total PCU/day
			No./ day	PCU/ day	No./ day	PCU/ day	No./ day	PCU/ day	No./ day	PCU/ day	No./ day	PCU/ day	No./ day	PCU/ day	
T1	6.8	SWS	12	36	117	117	26	26	176	88	59	89	11	50	406
T2	9	WNW	23	69	173	173	43	43	279	140	87	131	22	99	655

Source: (PCU Factor: Buses-3, Trucks-3, Car-1, Two-Wheeler-0.5)

The vehicle classification system adopted for conducting the traffic volume counts along with respective Passenger Car Unit (PCU) factors, as recommended by India Road Congress in "Guidelines for Capacity of Rural Roads in Plan Areas" (IR:106-1990) are given in Table 4.11.

Table 4-11: Detail of PCUs Factor as per IRC

Category	Vehicle Class	Equivalent PCUs Factors
Fast Vehicles	Motorcycle or scooter etc.	0.50
	Passenger car, pick-up van, or Auto-rickshaw	1.00
	Agricultural Tractor, Light Commercial Vehicle	1.50

Category	Vehicle Class	Equivalent PCUs Factors
	Truck or Bus	3.00
	Truck-trailer, Agricultural Tractor-Trailer	4.50
Slow Vehicles	Cycle	0.50
	Cycle rickshaw	2.00
	Hand cart	3.00
	Horse-drawn Vehicle	4.00
	Bullock Cart*	8.00

Source- Guidelines for Capacity of Rural Roads in Plan Areas" (IR:106-1990)

The details V/C ratio and level of service as per IRC Guidelines is given in Table 4.12.

Table 4-12: V/C Ratio and Level of Service (LOS) as per IRC

V/C Ratio	LOS	Performance
0.0-0.2	A	Represents a condition of tree flow
0.2-0.4	B	Represents a zone of stable flow
0.4-0.6	C	Represents zone of stable flow but with declining comfort and convenience
0.6-0.8	D	Represents the limit of stable flow
0.8-1.0	E	Represents operating conditions when traffic volumes are at or close to the capacity level
1.0-1.2	F	Represents zone of forced or breakdown flow

Source- Guidelines for Capacity of Rural Roads in Plan Areas" (IR:106-1990)

The existing traffic scenario and level of service is given in Table 4.13.

Table 4-13: Existing Traffic Scenario & Level of Service (LOS)

Location	Existing PCU per day							C = Capacity of PCU per day for roads (Intermediate Lane Roads)	Existing V/C Ratio	LOS as per IRC
	2-wheelers	3-wheelers	Passenger Car	Heavy vehicle	LCV	Truck-Trailer/ Tractor	Total PCU			
T1	88	26	117	36	89	50	406	6,000	0.07	A
T3	140	43	173	69	131	99	655	6,000	0.11	A

Source- Guidelines for Capacity of Rural Roads in Plan Areas" (IR:106-1990)

As per IRC guidelines, the Level of Service (LOS) of existing road represents a condition of free flow (LOS Category" A") at all sampling locations. The impact on traffic is described in Table 4.14.

Table 4-14: Traffic Scenario with Operation of Mine & Level of Service (LOS)

Year	Traffic Volume (PCU/day)	V/C Ratio	LOS as per IRC	Traffic Volume (PCU/day)	V/C Ratio	LOS as per IRC
	T1	T1	T1	T2	T2	T2
		6,000			6,000	
2022	406	0.07	A	655	0.11	A

Year	Traffic Volume (PCU/day)	V/C Ratio	LOS as per IRC	Traffic Volume (PCU/day)	V/C Ratio	LOS as per IRC
	T1	T1	T1	T2	T2	T2
Addition due to project (36 dumpers/ trucks)	774	-	-	774	-	-
Total PCU 2022	1180	0.20	A	1429	0.24	B
2023	**1263**	**0.21**	**B**	**1529**	**0.25**	**B**
2024	1351	0.23	B	1636	0.27	B
2025	1446	0.24	B	1751	0.29	B
2026	1547	0.26	B	1874	0.31	B
2027	1655	0.28	B	2005	0.33	B
2028	**1771**	**0.30**	**B**	**2145**	**0.36**	**B**
2029	1895	0.32	B	2295	0.38	B
2030	2028	0.34	B	2456	0.41	C

Source- Field Survey conducted during monitoring season.

After commencement of the project, the projected traffic represents conditions of free flow (LOS Category "B") and represents a zone of stable flow conditions in 2023 & 2028 also which is convenience at all locations. From the above table, it can be concluded that the incremental load on the carrying capacity of the concerned road is not likely to have any adverse effect or impact.

4.6.2. Traffic Management and Mitigation Measures

- ✓ Prohibiting on-street parking of vehicles, and simultaneously developing off-street parking facilities.
- ✓ It is proposed 7,900 no plantation on riverbank bunds, ancillary area & connected haul road with consultation of local administration and Forest department along the haul roads to prevent the impact of dust in the nearby village.
- ✓ To avoid accidents the speed of vehicles will be low near habitation areas.
- ✓ All trucks are to be used for transportation will be covered with tarpaulin, maintained, optimally loaded, and have Pollution test certificates.
- ✓ In peak hours, the transportation of dumpers will be suspended. Dumpers will be transported during day only.
- ✓ All vehicles and their exhausts would be well maintained and regularly tested for emission concentration.
- ✓ Transportation will be through covered trucks and wagons.
- ✓ Truck/tippers shall be parked in designated parking area only.
- ✓ From the above statements, it can be concluded that proposed mining project will have insignificant effect on the traffic and proper management plan will further reduce the negative impacts.

4.7. Impact on Noise & Vibration

Table 4-15: Impact on Noise, Vibration & Mitigation Measures

Attributes	Impact	Mitigation Measure
Human Animals	Noise from the machinery can cause hypertension, high	The machinery will be maintained in good running condition so that noise will be reduced

Attributes	Impact	Mitigation Measure
	stress level, hearing loss, sleep disturbance etc. due to prolonged exposure. Total 774 PCU/ day will increase in the existing traffic due to this mining activity hence vehicle collation may occur unwanted sound and can also cause impact on human health of villagers near to transportation route like effect on breathing and respiratory issues. Accidents may occur due to fast movement of vehicles.	to minimum possible level. Vehicles with PUC certificate will be hired. Regular maintenance of vehicles will be done to ensure smooth running of vehicle. Awareness will be imparted to the workers about the permissible noise level and effect of maximum exposure to those levels. Personal protective equipment will provide to prevent the noise exposure. Personal Protective Equipment will be provided during mining activity. In addition, truck drivers will be instructed to make minimum use of horns in the village area and sensitive zones. It is proposed to plant 7900 nos. of plants in plan period. The truck movement will be from suggested transportation route only. Regular Health checkup camps will be organized.
Crops	There is no major impact on plants and crops due to this operation.	

4.8. Impact on Water

There is no major impact on water environment. Assessment of the adverse impact and indicate the proposed mitigation. The total water demand will be 40.2 KLD for the mining operation, domestic use, and plantation purpose. 0.6 KLD municipal wastewater also will be generated which will be treated in septic tank & further may be utilized for water sprinkling. No discharge into the river will be ensured.

Table 4-16: Impact on Water Regime and Its Mitigation Measures

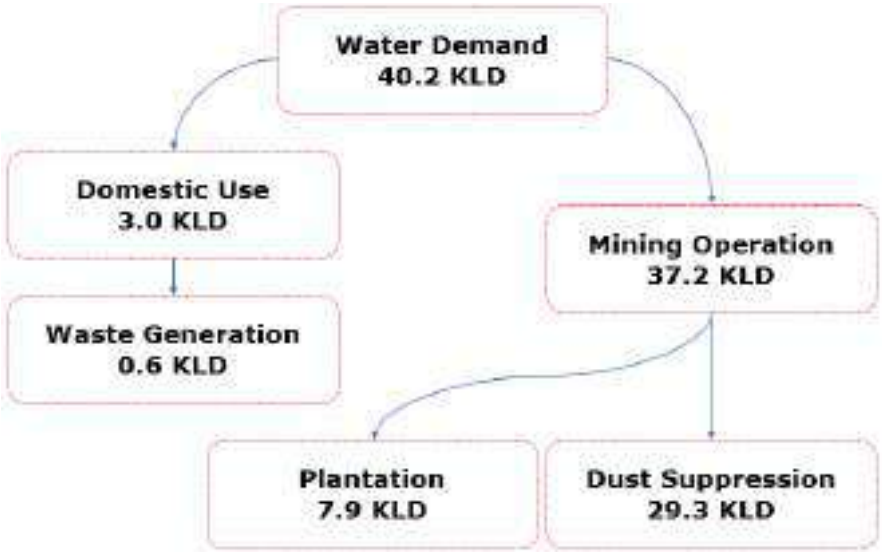
Attributes	Impact	Mitigation Measure
Human Animals	The mining in the riverbed area may cause the ground water contamination due to intersection of the water table. The municipal wastewater disposed from the mining activity may cause contamination of surface water.	The mining in the lease area will not intersect to the ground water level as this is sandmining project from riverbed. The maximum depth of sand mine will be 3m and only mining will be done in dry seasons except monsoon and water stream will not be touched during mining. So, the chances of water pollution are very minimal. The domestic wastewater disposed from the mining activity may cause contamination of surface water.
Crops Plants	Wastewater discharges through mining operation directly affect the crops and plants	

Table 4-17: Water Demand Estimation & Budget

Mitigation Measures	Brake-up	Demand
Drinking & Domestic @45 lpcd/ worker	(67 workers x 45 lpcd = 3015 l/ day)	3.0 KLD
Plantation (Mine Lease 2,500 / Year & Haul Road 1,450)	(2,500 Trees x 2 l/ day + 1,450 Trees x 2 l/ day = 7,900 l/day)	7.9 KLD

Mitigation Measures	Brake-up	Demand
Dust Suppression@0.5 L/Sq.m (Twice in a day)	Area for Dust Suppression = (4,350 m haul road + 1,500 m within the mine lease) x 5 m Width = 29,250 m^2) x 0.5 l/sqm x 2 = 29,250 L/day	29.3 KLD
	Total in KLD	**40.2 KLD**

Figure 4.4: Water Balance Diagram



4.9. Impact on Soil Environment and mitigation measures

Below table is showing the impact on soil environment and its mitigation measures.

Table 4-18: Impact on Soil Environment and Its Mitigation Measures

Attributes	Impact	Mitigation Measure
LU/LC	Mining activity in the riverbed may change complete land-use pattern including channel geometry, bed elevation, sediment transportation capacity which can reduce flow of the river and downstream erosion.	The mining is planned in non-monsoon seasons only so that the excavated area will be replenished naturally during the subsequent rainy season for the riverbed mining block. Mining activity will be done only 20.02 ha only out of 25.04 ha as 5.04 ha area will be left as safety zone. Pre- and post-monsoon survey for sedimentation in the riverbed will be done regularly.
Crops & Plantation	Mining activity may increase the soil erosion and soil degradation which have adverse impact on soil fertility.	Mine lease area has been proposed leaving a safety distance of 1/3rd of the width of the river from the bank inwards which will protect the banks so channel geometry will not be disturbed. Mining activity may increase the soil erosion and soil degradation which have adverse impact on soil fertility in surrounding agricultural land. It is proposed to do plantation comprising of local species in plan period with consultation of Forest department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the mining area which enhances the binding property of the soil to check the erosion.

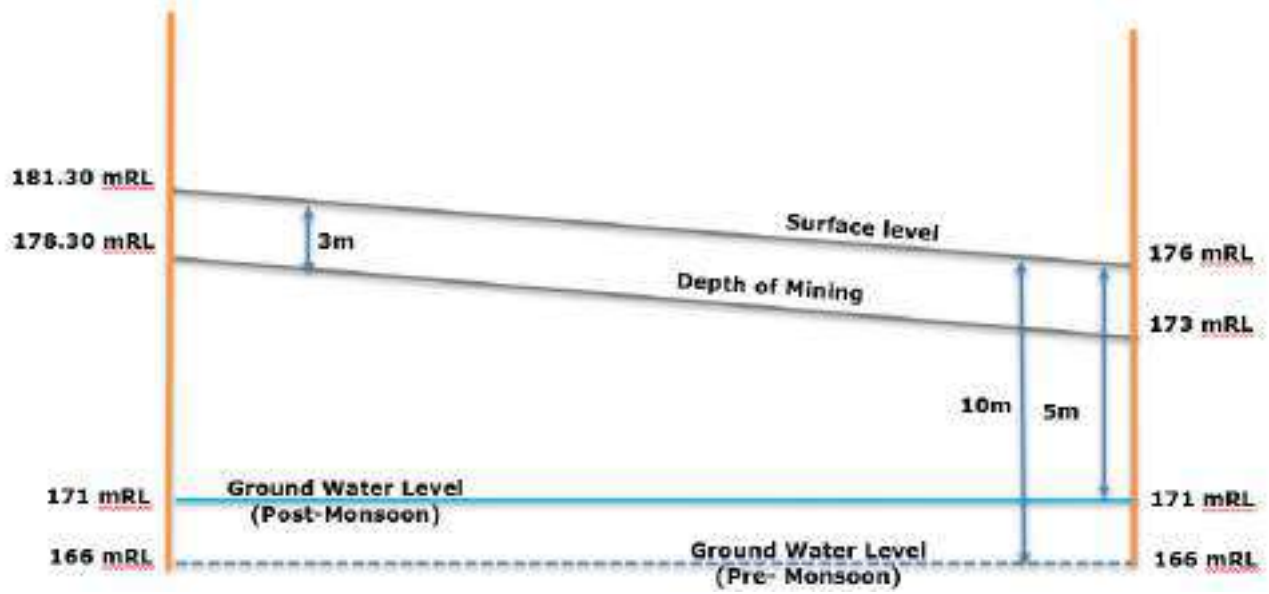
4.10. Impact on Hydrology and Mitigation measures

Below table is showing the impact on hydrology and its mitigation measures.

Table 4-19: Impact on Hydrology and Its Mitigation Measures

Impact	Mitigation Measure
The mining in the mine site area may cause the ground water contamination due to intersection of the water table.	The water table will not be intersected during the entire period of mining in the riverbed as ultimate depth is limited up to 3.0 m as the water table is 5-10 m BGL. Proper analysis/Monitoring will be done to check the ground and surface water quality.
Change the topography will divert the water flow.	There is no proposal of any stream modification/diversion due to this mining activity hence there will be not any impact on flow of water.

Figure 4.5: Impact of Mining on Ground Water



4.11. Biological Environment

Impact on Terrestrial Flora: Dust deposition on leaf lamina observed on nearby local plant species which may results in decline the rate of photosynthesis and retards the plant growth.

Table 4-20: Impact on Ecology due to Mining Activity and Its Mitigation Measures

S. No.	Impact	Mitigation Measure
1	Mining on the riverbed, braided flow or subsurface flow may hinder the movement of fishes between pools. Transportation of mineral in the trucks/Trippers will disturb the movement of wild animals and reptiles.	Transportation of mineral will be minimized in the morning and evening and cannot be done in night. Plantation will be carried out along the approach roads and nearby community land and govt. lands & both riverbanks. Neem, Peepal, Mango, Shisham, Sirish, Babool, Gulmohar and other local fruity plants are proposed for reduce the emission generated by transportation & mining operation.
2	Fugitive emission from vehicle movement will form a layer in leaves thus reducing the gaseous	Haul roads will be sprinkled with water which would reduce the dust emission, thus avoiding damage to the crops. Annual monitoring of roadside plants exposed to vehicular pollution

S. No.	Impact	Mitigation Measure
	exchange process. This ultimately affects the growth of plants.	will be done to check the dust load and Air Pollution Tolerance Index (APTI).
3	Chances of vehicle collisions with wildlife attempting to crossroads are possible.	Transportation of mineral will be minimized in the morning and evening and cannot be done in night. Speed of trucks/dumpers will not exceed the speed limit i.e., 20 km/hr in the dust prone area, village area and wildlife sensitive areas.
4	Any human settlement in the mining area will disturb the vegetation cover and reptiles.	No human settlement will be permitted in the lease mining or nearby area.
5	In discriminate mining from active channels of rivers causes many adverse effects on the benthic fauna, which inhabits the bottom sandy substratum.	Scientific mining will be done as per the approved mining plan.
6	Excessive mineral extraction from rivers affects the eco-biology of many terrestrial insects whose initial life history begins in aquatic environments.	No mining will be carried out during the rainy season to minimize impact on aquatic life.
7	The Indian peafowl movement is very common in the area; the noise from sand mining will hinder the same.	Green belt and community forestry program will be proposed to encourage the green cover which is able to reduce the noise level. If wildlife is noticed crossing the area, they will not be disturbed at all.
8	Mining may drive away the wildlife from their habitat, and significantly affect wildlife and nearby residents.	Shelter and fodder providing tree species will be proposed in the plantation program which cater the wildlife and may be reduce the destructive impacts of mining on wildlife. Awareness program about wildlife and its importance will be conducted for workers and nearby residents so that they will not disturb the wildlife at all. Sign boards will be displayed as mentioned in conservation plan (enclosed as annex).

4.12. Impact on Socio-Economic Environment

To assess the impacts on socioeconomic profile, the related information has been obtained through primary sources as well as secondary sources. Report has been prepared using a combination of methods, including Focus Groups Discussion (FGD) tools and techniques, site visit, community observations, and informal and formal surveys. Direct observation-based methods were implemented to help identifying current socioeconomic environmental Scenario and potential impacts of mining activities as experienced by the local people in the study area, and to rank socioeconomic activities based upon their contribution to household livelihood. This observation/ study reflected various socioeconomic variables and direct-indirect impacts between mining and non-mining communities.

The potential impact of proposed mining activities as experienced by the locals in the villages of the area under study was identified through survey to rank socioeconomic contribution ensuring development. In facts, People perceive that the project will bring handful gains by way of creating significant job opportunities along with development of social infrastructure. The impacts on the different components viz employment, housing, educational, and medical and transport facilities, fuel availability, economics, status, health agriculture is not significant because size of project is small. Some of these impacts reported by local people & observed during the visit would be beneficial.

4.12.1. Positive Impact

Increase in Job Opportunities: Critically analysing the existing environmental status of the socio-economic profile and visualizing the scenario with the project, the impacts of the project would be varied and may generate both positive and negative impacts of the proposed project in the region that are stated. Manpower required for the proposed project is about 13 personnel which may include skilled and unskilled workers which will be sourced from local population. As such the project will have positive impact in the area.

No Rehabilitation: Hence, Resettlement & Rehabilitation is not required as there is no land acquisition or displacement of any houses, habitation, or livestock.

Minimal burden in the existing infrastructure facilities: Local work force will be given first preference in the activity due to which influx of the outsiders is not envisaged or it will be very minimal. Thus, there will not be the necessity of provision of housing facility for the local workers and not stressing on the existing civic amenities of the area. If enough local workers will not be available, then workers from outside will be engaged. For the outside workers if any, housing arrangement and the facilities will be provided at the project site.

Improvement in infrastructure: The activity will benefit the local people due to provision of more infrastructural facilities such as developments of approach routes within the village area, streetlight, health facilities etc.

Impact on road development: Movement of trucks and other vehicles to and from the quarry is expected to increase substantially when mining will start. The existing roads connecting the quarry with the national and state highways are mostly narrow mud roads. There will be mud slide and traffic bottle neck if these roads are not widened, and their conditions are not improved by making them paved roads. Hence, there is ample scope for road development in and around the mining areas.

4.12.2. Negative Impact

The negative impact will be limited to some sporadic health problems, which may occur due to increase in fugitive emission near the mines. However, as the incremental dust due to mining activities will be about 1.1 µg/m^3 within lease area, there will be within the mining area and will be negligible impact on human health.

Table 4-21: Impact on Socio-economic and Its Mitigation Measures

Impact	Mitigation Measure
Due to mining and transportation of sand will generate the opportunity of indirect employments like small shops, Dhaba, garage and restaurant, vegetable shops etc.	Positive Impact

Impact	Mitigation Measure
Mining activity will be committed to generate direct employment by recruiting 67 people which will be employed locally, and preference will be given to local people.	Positive Impact
Productivity of crops will be deteriorated affecting the agriculture-based livelihood due to the pollution arising out of the mines, if proper mitigation measures are not implemented	40.2 KLD water will be proposed for dust suppression at mine site and approach road by sprinklers to avoid dust generation during mining activity and transportation. It is proposed to plant 7,900 nos. of local tree species for three years with consultation of local administration and forest department which help to reduce in the pollution level.
Extraction from riverbanks and beds and the resultant generation of fugitive dust cause workers of the mine to suffer from occupational hazards like skin allergies, eye, and respiratory problems etc. Further, the deep pits created in the channel also can contribute to an increase in accidents in the working environment. This creates serious threat to residents in the area who depend on river water for their domestic purposes.	Mine lease area has been proposed leaving a safety distance of 1/3rd of the width of the river from the bank inwards which will protect the banks. Dust mask will be provided to the workers engaged at dust generation points like excavation and loading points. Regular water sprinkling on unpaved roads to avoid dust generation. The mined-out area in riverbed block will be reclaimed naturally every year. The mining is planned in non-monsoon seasons only so that the excavated area will be replenished naturally during the subsequent rainy season for the riverbed mining block.
The major source of socio-health impacts of transportation will generate from truck, dust etc. Increase in accidents because of rash driving of dumpers carrying mineral through the roads may be possible.	The plantation is proposed to be done in first 2 years and will be ensured 100% survival in third year. In later fourth & fifth year, plants will be maintained. Local species will be preferred for plantation.

4.13. Impacts on Solid Waste/ Over Burden & Mitigations

The small quantity of domestic solid waste will be generated which will be disposed through the gram panchayat. Only 16 kg/day will be generated. No topsoil is available on project site. Dustbins will be provided for the domestic waste generated from lease.

4.14. Impacts on Occupational Health & Safety

Details of the principal environmental and occupational risks that are likely to be created are given in below table.

Table 4-22: Impact on Occupational Health & Safety and Mitigation

Impact	Mitigation Measure
The mining of sand (minor mineral) from the riverbed can cause the lung disease and respiratory disorder due to dust exposure.	Dust masks will be provided as additional personal protection equipment (helmet and safety shoes) to the workers working in the dust prone area. Regular water sprinkling will be done, and dust masks will be provided to the workers.

Impact	Mitigation Measure
Due to noise exposure, hearing disorder may be resulted.	Earmuffs will be provided to the workers and good maintenance of vehicles will be provided.
The accident at the site due to mining operation may be anticipated.	Workers are informed, kept aware and trained about possible accidents during the mining operation and persona protective equipment will be provided viz. gloves, safety shoes, dust mask, safety jackets, helmet etc. In addition to, the awareness about the occupational health hazards due to mining activities to avoid any incident will be provided to the workers. Pre-placement health check-up will be made mandatory and periodic heath check-up will be done quarterly.

4.15. Mine Closure Plan

Detailed in **Section 2.7 of Chapter 2**.

4.16. Conclusion

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the measures are suggested to mitigate any harmful impacts of pollutants like a plantation of trees along haul roads, especially near settlements, to help to reduce the impact of dust on the nearby villages; planning, transportation routes of mined material to reach the nearest paved roads by the shortest route; regular water sprinkling on unpaved roads to avoid dust generation during transportation etc. Some of impacts may be due to increase in traffic. Transportation of mineral should be minimized in the morning and evening and cannot be done in night.

The impact on the present noise levels due to mining operations will be restricted to the work zone areas only. The impact on the ambient noise levels will not be felt at the settlement areas due to masking effect with the existing noise levels. The mining activities will be done in a systematic manner by maintaining the road infrastructure and vehicle transport, which will be a protective measure for preserving the topography and drainage in the area.

The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities. Except dust generation, there is no source which can show a probability for health-related diseases. Regular water sprinkling will be done with sprinkles mounted tankers and dust masks will be provided to the workers. All workers will be subjected to a medical examination as per Mines Rule 1955 both at the time of appointment and at least once in a year. Medical camps will be organized for this activity. Insurance for all employees as per the rules will also be carried out.

CHAPTER – 05

ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

5. Analysis of Alternatives (Technology & Site)

5.1. Introduction

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

5.2. Alternative of Mines

The Ministry of Environment, Forest, and Climate Change (MoEF&CC), Govt. of India through its notification of 14th September 2006 and its subsequent amendment under the Environment (Protection) Act, 1986 classifies the projects under Cat. B1. This is a project of minor mineral.

Sand (Minor Mineral) deposits are site specific. It is present in Yamuna riverbed. The mining of the material will be done by opencast manual method in riverbed. The mining will be done as per procedures laid down by Haryana Minor Mineral Concession Rules.

During monsoon season, when rivers reach high stage, Yamuna River also bears significant catchment area, and it transports riverbed material (sand) which gets accumulated at such stretch which widens the river width and concave banks. Thus, it is evident that the proposed site will be mined for the purpose of preventing land cutting during heavy rainfall and floods.

The mined-out area in riverbed block will get replenished annually after monsoon. Therefore, no alternate site is suggested as existing land use of mine lease classified as “River Body” and will continue to be so even after the current mining period is over.

It is case of fresh quarry lease. The mineral is site specific, so no alternative site was identified. Lease approval from concerned authority has been obtained and enclosed in report.

5.3. Alternative for Technology and Other Parameters

The alternative studies done for the project are given below:

Table 5-1: Alternative Technology & Other Parameters

S. No.	Particular	Alternative Option 1	Alternative Option 2	Remarks
1	Technology	Open-cast manual mining.	Open-cast semi mechanized mining	Open cast manual is preferred due to benefits listed below: ✓ Less time consuming ✓ No electric power requirement ✓ Minimal noise will be generated. ✓ Minimal air pollution will be generated. ✓ Overburden will not be generated.
2	Employment	Local employment	Outsource employment	Local employment is preferred which will benefit to the region as given below: ✓ Provides employment to local people along with financial benefits. ✓ No residential building/housing is required
3	Labourer transportation	Public transport	Private transport	Local labours will be preferred which will not generate additional load on public

S. No.	Particular	Alternative Option 1	Alternative Option 2	Remarks
				transport. So, the cost of transportation of for labour will be negligible.
4	Material transportation n	Truck transport	Rail transport	Material will be transported through Dumpers on the contract basis from locals which will indirectly benefit to region.
6	Water requirement	Tanker supplier	Ground water/ surface water supply.	Private water tankers will be preferred for water supply which will ensure to no change in ground or surface water level/ quality.
7	Road	Haul road	Metalled road.	Existing road will be upgraded or widened for the mineral transportation purpose. Two-sided plantation will be ensured on haul road with two-time water sprinkling on haul road.

5.4. Environmental Attributes Management and Mitigation

Adequate environmental management measures will be incorporated during the entire planning, pre- construction, construction, and operational stages of the project to minimize any adverse environmental impact and assure sustainable development of the area.

The mitigation measures which have been suggested for the construction and operational stages of the proposed development will include the following elements:

- ✓ Water sprinkling shall be done on haul roads where dust generation is anticipated.
- ✓ Mineral & OB storage and handling yard will be enclosed from all sides.
- ✓ To minimize the occupational health hazard, proper personal protective equipment's shall be provided to the workers working in the dust prone areas.
- ✓ Air Pollution Control and Management will be done.
- ✓ Noise Control and Management will be done.
- ✓ Water treatment and management will be done.
- ✓ Hazardous and Solid Waste Management will be done.
- ✓ Plantation and Landscaping development will be ensured.
- ✓ Sewage Treatment, Recycle and reuse Energy Conservation

CHAPTER – 06

ENVIRONMENT MONITORING PROGRAM

6. Environment Monitoring Plan

6.1. Introduction

Environmental monitoring program is an essential tool for sustainable development. An environmental monitoring program provides a delivery mechanism to address the adverse environmental impacts of a project during its execution, to enhance project benefits, and to introduce standards of good practice to be adopted for all projects works. An environmental monitoring program is important as it provides useful information and helps to:

Table 6-1: Environmental Management Plan, Activities & Implementation

Environmental Management Plan Activities	Implementation Process
✓ Assist in detecting the development of any unwanted environmental situation, and thus, provides opportunities for adopting appropriate control measures. ✓ Monitoring & tracking the effectiveness of Environmental Management Plan & implementation of mitigation measures planned. ✓ Define the responsibilities of the project proponents, contractors and environmental monitors and provides means of effectively communicating environmental issues among them. ✓ Define monitoring mechanism and identify monitoring parameters. ✓ Evaluate the performance and effectiveness of mitigation measures proposed in the Environment Management Plan (EMP) and suggest improvements in management plan, if required. ✓ Identify training requirement at various levels. ✓ Identification of any significant adverse transformation in environmental condition to Plan additional mitigation measures.	✓ Environmental surveillance ✓ Analysis and interpretation of data ✓ Preparation of reports to support environmental management system and ✓ Organizational set up responsible for the implementation of the programme.

6.2. Environmental Management Cell

Environmental Monitoring will be taken up for various environmental components as per conditions stipulated in Environmental Clearance Letter issued by MoEF&CC and Consent to Operate issued by the State Pollution Control Board. Compliance of same will be submitted to respective authorities on regular basis.

To maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will have complied as per conditions. Proponent has been formulated an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. The system of reporting of Non-conformances / violation of any Environmental Law/ Policy will be as per quality management system. The internal audit will be conducted on periodic basis and any Non-conformances/violation to Environmental

Law/ Policy will be closed and discussed during Management Review Meetings of board of directors/ partners.

6.2.1. Hierarchy

A Manager will be appointed to supervise to subordinates for all activities like mining, transportation, environmental pollution controls, workers safety and greenbelt development activity. An Assistant Manager (EHS) will be responsible for the environment, health and safety related issues and supervise to the subordinates like supervisor (who is working in mine site), environmental executive (responsible for regular environmental compliances and coordinate with local administrative body to regarding environmental issues) and horticulturist (responsible for plantation and green area development).

6.2.2. Responsibilities for Environmental Management Cell

The responsibilities of the EMC include the following:

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

6.3. Environmental Monitoring and Reporting Procedure

Environmental Monitoring plan shall be decided considering the environmental impact likely to occur due to operation of the project as the main scope of monitoring program is to track timely and regular change in the environmental condition and to take timely action to protect the environment. 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.

The key aims of environmental monitoring program are:

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

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

Table 6-2: Monitoring Methodologies and Parameters

Attributes	Frequency & Location	Measurement Method	Pursuing Agency	Responsibility
A. Air Environment				
PM_{10}, $PM_{2.5}$, SO_2, NO_x & CO	Six Monthly (Within lease area, nearby habitat & as per wind pattern & Transportation)	National Ambient Air Quality Standards (NAAQS) 2009 & IS 5182	SPCB / MoEF&CC	Environment Monitoring Cell
B. Water Environment				
Drinking Water (Ground Water) & Surface Water	Six Monthly (Nearby water body and habitat)	As per IS 10500-2012	SPCB / MoEF&CC	Environment Monitoring Cell
C. Noise				
Noise levels at Day and night - Leq dB (A)	Six Monthly (Lese Area & nearby Habitat)	As per CPCB norms	SPCB / MoEF&CC	Environment Monitoring Cell
D. Soil				
Physical & Chemical Properties of Soil	Six Monthly (Nearby Region)	As per CPCB norms	SPCB / MoEF&CC	Environment Monitoring Cell
E. Socioeconomic				
Health status, Cultural & aesthetic attributes, and Education	Yearly (Bases on consultation with panchayat)	Primary data collection through questionnaire	SPCB / MoEF&CC	Environment Monitoring Cell (Mining In charge)
F. Ecological Impact				
Green Belt Development & Conservation of Wildlife	Yearly (Nearby sensitive receptor)	Primary data collection.	SPCB / MoEF&CC	Environment Monitoring Cell (Mining In charge)

6.4. Reporting Schedule during Operation of Mine

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

6.5. Monitoring Budget

Table 6-3: Environment Management Budget

S. No.	Particulars	Amount (lacs)
1	Pollution monitoring – Air, Water, Noise & Soil	3.0
2	Pollution Control – Water sprinkling	5.0
3	Wire fencing at plantation sites	0.6
4	Plantation including maintenance	1.50
5	Rainwater Harvesting	3.0
6	Haul road and other roads repair and maintenance	3.0
7	Pre & post-monsoon survey for sedimentation in the riverbed	2.0
	Total	**18.10**

6.6. Conclusion

To maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will have complied as per conditions. An Environmental Management Cell will be prepared who will be committed to implementation of proposed objectives mentioned in approved Environment Policy. Regular Monitoring of all the environmental parameters viz., air, water, noise, and soil as per the formulated program based on CPCB and MoEF&CC guidelines will be monitored through NABL/ MoEF&CC approved laboratory.

CHAPTER – 07

ADDITIONAL STUDIES

7. Additional Studies

7.1. General

Mining operations are associated with several potential hazards that affect adversely the human health and environment. It would normally require the assistance of emergency services to handle it effectively. The mining operation will be taken up under the supervision and control of qualified staff including Mine Manager (Grade I). Similarly, mines also have impending dangers and risk which need to be addressed for which a disaster management plan has been prepared with an aim of taking precautionary steps to avert disasters and to take such action after the disaster which limits the damage to the minimum. Nevertheless, the following natural/ industrial problems may be encountered during the mining operation.

- ✓ Inundation due to flood.
- ✓ Accidents by heavy machinery.
- ✓ Slope failures at the mine faces etc.

In additional studies, we particularly discussed about the public consultation, risk analysis & risk management and disaster management plan.

7.2. Public Hearing & Consultation

As per the conditions of the ToR and the EIA Notification 2006 and its amendment, a Public Hearing will be conducted by Haryana State Pollution Control Board at Mine Site as per the provisions of EIA Notification, S.O. 1533 dated 14.09.2006 and its amendment for Environmental Clearance of Mine Lease.

7.3. Hazard Identification and Risk Assessment Methodology

Risk assessments will help mine operators to identify high, medium, and low risk levels. This is a requirement of the Occupational Health and Safety Act 2000 with further amendments as The Occupational Safety, Health, and Working Conditions Code, 2020. Risk assessments will help to priorities the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements. The following natural/ industrial problem may be encountered during the mining operation.

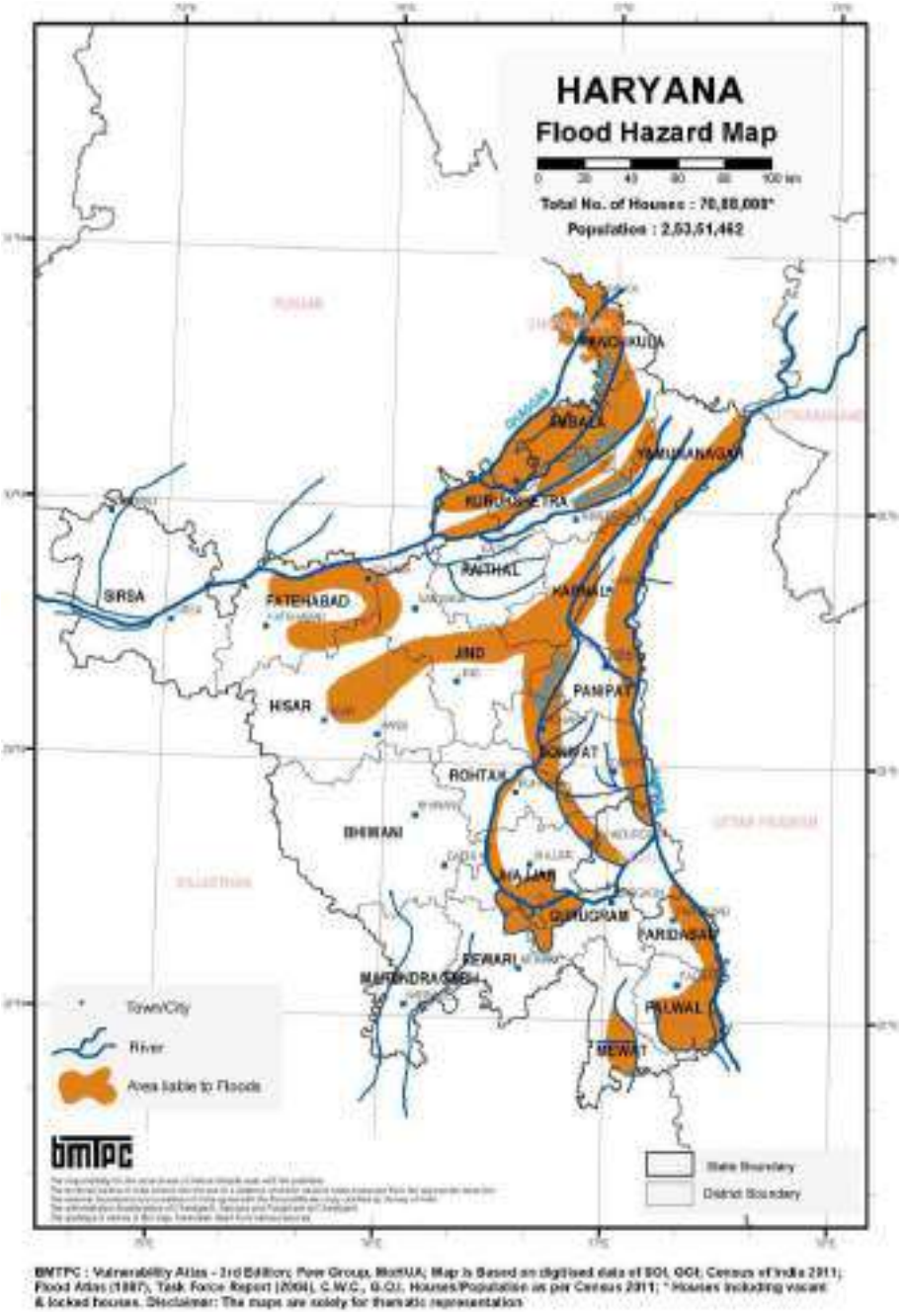
- ✓ Inundation/Flooding
- ✓ Slope failure at the mine faces or stacks
- ✓ Quicksand Condition
- ✓ Accident due to vehicular movement
- ✓ Accident during Sand loading, transporting, and dumping.
- ✓ Occupational Health Hazar.

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

7.3.1. Inundation/Flooding

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

Figure 7.1: Floor Hazard Map of Haryana State



BMTPC : Vulnerability Atlas - 3rd Edition; Peer Group, MoHUA; Map is Based on digitised data of SOI, GOI; Census of India 2011; Flood Atlas (1987), Task Force Report (2004), C.W.C., G.O.I. Houses/Population as per Census 2011; * Houses including vacant & locked houses. Disclaimer: The maps are solely for thematic representation

Palwal did not face severe flood situation till now. But still Palwal got affected in 1978, 2010 and now in 2013 due to the floods. The villages situated at the bank of the river got affected in 1978. As these were not severe and flash floods, only agricultural fields were got affected. In 2010, 13924 Acres was the total crop area damaged due the flood. No other damaged had been seen in 2010, 2013 & 2017.

7.3.2. Slope Failure at the Mine faces or stacks

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

7.3.3. Quicksand Condition

- This condition occurs when the working crosses the water table at a certain depth and the permeability of the strata is very high.
- This condition will not occur as the digging will be done up to 3 m depth not touching the water table.

7.3.4. Drowning

There are possibilities of drowning in the deeper part of the river. However, safety jackets, floating tube will be kept at the site office to prevent any mishap.

7.3.5. Accident due to Vehicular Movement

Most of the accidents occur during transportation by dumpers, trucks and other vehicles and are often attributable to mechanical failures, in which the factor of human errors cannot be ruled out. Identifying the hazards that come along with the presence of vehicles at the workplace (e.g., reversing operations, loading) can cause harm if not properly handled. Among some of the factors that may make vehicle accidents more likely are:

- Rough access roads
- Time pressure
- Inadequate brakes (Possibly from lack of maintenance)
- Carelessly parked vehicles (e.g., being parked on a slope without being adequately secured)
- Unsafe coupling and uncoupling of trailers, and
- Untrained drivers
- Overturning vehicles

7.3.6. Accident during Sand loading and Transportation

Sand Loading:

- The sand is loaded in the trucks using hand shovels and back-hoe. There are possibilities of injury in the hands during loading with shovels and staying under bucket movement.
- There are possibilities that the workers standing on the other side of loading may get injury due to overthrown sands with pebbles.
- There are possibilities of workers getting injured during opening of side covers of the trucks to facilitate sand loading.
- There are possibilities of riverbank collapse due to proximity of sand extraction.
- There are chances of falling of cattle/children into sand pit in riverbed- instances of death due to fall in such pits were reported from other areas to the Department of Mines.

Sand Transport:

- The sands loaded in 25 Tons trucks are being sent to the market through public roads.
- All possibilities of road accidents are possible.
- Accident may also occur during movement in the mine (sand dunes).
- There are possibilities that due to overloading, some pebbles or big boulder may injure the public.

7.3.7. Occupational Health Hazard

Open cast method involves dust generation by excavation, loading and transportation of mineral. At site, during excavation and loading activity, dust is main pollutant which affects the health of workers whereas environmental and climatic conditions also generate the health problems. Addressing the occupational health hazard means gaining an understanding of the source (its location and magnitude or concentration), identifying an exposure pathway (e.g., a means to get it in contact with someone), and determination of likely a receptor (someone receiving the stuff that is migrating). Occupational hazard due to open cast mining mainly comes under the physical hazards. Possible physical hazards are as below:

Physical Hazards due to Mining Operations:

Following health related hazards were identified in open cast mining operations to the workers:

a. **Light:** - The workers may be exposed to the risk of poor illumination or excessive brightness. The effects are eye strain, headache, eye pain and lachrymation, congestion around the cornea and eye fatigue. In present case, the mining activity is done during daytime only.

b. **Heat and Humidity:** - The most common physical hazard is heat. The direct effects of heat exposure are burns, heat exhaustion, heat stroke and heat cramps; the indirect effects are decreased efficiency, increased fatigue, and enhanced accident rates. Heat and humidity are encountered in hot and humid condition when temperatures and air temperatures increase in summer up to 46.1^{0}C or above in the riverbed mining area.

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

d. **Respiratory Problems:** - Large amounts of dust in air can be a health hazard, exacerbating respiratory disorders such as asthma and irritating the lungs and bronchial passages.

e. **Noise Induced Hearing Loss:** - Machinery is the main source of noise pollution at the mine site.

Risk Level using Risk Matrix: Risk Matrix is used to identify the level of risk involved in various hazards identified.

Table 7-1: Risk Level Matrix

Risk Assessment Matrix		**Consequences**				
		Insignificant (1) No injuries	**Minor (2)** First Aid Treatment	**Moderate (3)** Medical Treatment	**Major (4)** Hospitalization	**Catastrophic (5)** Death
Likelihood	**Almost Certain (5)** Often / Once a week	Moderate (5)	High (10)	High (15)	Catastrophic (20)	Catastrophic (25)
	Likely (4) Could easily happen / once a month	Moderate (4)	Moderate (8)	High (12)	Catastrophic (16)	Catastrophic (20)
	Possible (3) Could happen or known it to happen / Once a year	Low (3)	Moderate (6)	Moderate (9)	High (12)	High (15)
	Unlikely (2) Hasn`t happened yet but could / once every 10 years	Low (2)	Moderate (4)	Moderate (6)	Moderate (8)	High (10)

Risk Assessment Matrix		Consequences				
		Insignificant (1) No injuries	**Minor (2)** First Aid Treatment	**Moderate (3)** Medical Treatment	**Major (4)** Hospitalization	**Catastrophic (5)** Death
	Rare (1) Conceivable but only on extreme circumstances / Once in every 10 years	Low (1)	Low (2)	Low (3)	Moderate (4)	Moderate (5)

Table 7-2: Identification of Likely Risks in Sand Mining from Riverbed

S. No.	Activities	Risk Probability		
		Occurrence	**Consequence**	**Risk Level**
1.	Sand Loading	Possible	Major	High
2.	Sand Transport	Possible	Major	High
3.	Inundation/Flooding	Rare	No injuries	Low
4.	Drowning	Possible	Catastrophic	High
5.	Vehicular Movement	Likely	Catastrophic	Catastrophic
6.	Occupational Health Hazard	High	Moderate	High
7.	Slope Failure	Possible	Moderate	Moderate

7.4. Disaster Management Plan & Mitigation Measures

The Disaster Management Plan (DMP) is a guide, giving general considerations, directions, and procedures for handling emergencies likely to arise from planned operations. The DMP has been prepared based on the Risk Assessment and related findings covered in the report.

The objectives of DMP are to describe the company's emergency preparedness, organization, the resource availability, and response actions applicable to deal with various types of situations that can occur at mines in shortest possible time.

Thus, the overall objectives of the emergency plan are summarized as: -

- ✓ Rapid control and containment of Hazardous situation
- ✓ Minimum the risk and impact of event/ accident
- ✓ Effective prevention of damage to property.

To effectively achieve the objectives of emergency planning, the critical elements that form the backbone of Disaster Management Plan (DMP) are:

- ✓ Reliable and early detection of an emergency and immediate careful planning.
- ✓ The command, co-ordination, and response organization structure along with availability of efficient trained personnel.
- ✓ The availability of resources for handling emergencies.
- ✓ Appropriate emergency response action.
- ✓ Effective notification and communication facilities.
- ✓ Regular review and updating DMP.
- ✓ Training of the concerned personnel.
- ✓ Steps taken for minimizing the effects may include rescue operations, first aid, evacuation, rehabilitation and communicating promptly to people living nearby.

7.4.1. Mitigation Hazards

Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in a mine will be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions also will not impair his working efficiency. This is possible only when there is adequate safety in mines. Hence mine safety is one of the most essential aspects of any working mine. The safety of the mine and the employees is taken care of by the Mines Act 1952, which is well defined with laid down procedure to ensure safety and constantly monitored and supervised by Directorate General of Mines Safety and Department of Mines, State Government.

7.4.1.1. Measures to Prevent Accidents during Sand Loading.

i. The trucks will be brought to a level so that the sand loading operation suits to the ergonomic condition of the workers and the backhoe.
ii. The loading will be done from one side of the truck only.
iii. The workers will be provided with gloves and safety shoes during loading. Opening of the side covers will be done carefully and with warning to prevent injury to the loaders.
iv. No sand will be collected within 12.0 m safety zone left from all sides, especially from outer bank of the meandering river. Safe clearance will be mainly determined by the height of the riverbank and thickness of sand to be extracted from the close vicinity of that bank.
v. Ponding in the riverbed shall not be allowed.
vi. Operations during daylight only.
vii. No foreign material (garbage) will be allowed to remain/spill in riverbed and catchment area, or no pits/pockets are allowed to be filled with such material.
viii. Stockpiling of harvested sand on the riverbank will be avoided.
ix. For operations, approaching riverbed from both the banks will be avoided.
x. Digging outside riverbank within 500m for pit sand and gravel and taking anything from that zone for construction of access ramps, will be strictly prohibited.

7.4.1.2. Measures to Prevent Accidents during Sand Transportation

i. All transportation within the main working will be carried out directly under the supervision and control of the management.
ii. The Vehicles must be maintained in good repairs and checked thoroughly at least once a week by the competent person authorized for the purpose by the Management.
iii. Road signs will be provided at each turning point especially for the guidance of the drivers at the evening/night.
iv. To avoid danger while reversing the trackless vehicles especially at the embankment and tipping points, all workers will be removed from all areas for reversing of lorries, and the vehicle will have audio-visual alarm during reversing.
v. A statutory provision of the fences, constant education, training etc. will go a long way in reducing the incidents of such accidents.
vi. Generally, overloading will not be permitted. Big boulders will not be loaded. This is unsafe and may damage equipment and stowing bunker.
vii. The truck will be covered and maintained to prevent any spillage.

viii. The maximum permissible speed limit will be ensured.
ix. The truck drivers will have proper driving license.

7.4.1.3. Safety Features Required in Tippers/Trucks

i. Exhaust/ Retard Brake: Required as per DGMS circular 02 of 2004.
ii. Propeller shaft guard: Propeller shaft guard as per DGMS circular 10 of 1999.
iii. iii. Tail gate protection: Protection of cabin against collision either by head-to-head or head to tail.
iv. Limiting speed device: To ensure speed limits as decided by management. The device may be Electronic or mechanical type speed governors.
v. Reverse gear for audio-visual alarm: The audio-visual alarm provided for equipment will confirm to DGMS (Tech.) Tests to be carried out on the audio-visual alarm and certificates shall be issued to user industries.
vi. Provision of two brakes: One of brakes shall be fail safe & for details refer DGMS circular 09 of 1999.
vii. Body lifting position locking arrangement: A hooter along with an indication may be provided to show the body is lifted.
viii. Fire suppression System: Semi-automatic fire suppression system. For details refer DGMS circular 10 of 2004. The fire suppression system shall be a factory fitment.
ix. Blind spot mirror: better view of front blind spot by operator.
x. Retro reflective reflectors on all sides: For visibility of truck during night
xi. Seat belt reminder: To alert operator for using the seat belt.
xii. Proximity warning device: To alert operator.
xiii. Rear Vision System: For assisting operator to have back view during reversing.
xiv. Auto dipping System: To reduce glaring of eyes of operator during night.
xv. Load Indicator and Recorder: Enables management to detect and prevent over loading.
xvi. Global Positioning system: To prevent illegal transport and selling of sand, restricting short-cut routes other than stipulated routes and computerized monitoring.

7.4.1.4. Measures to Prevent Accidents due to Vehicular Movement

To avoid instances/accidents, the workers and their representatives should be aware of hazard involved and tell them what to do, to reduce risk. All transportation within the mine lease area should be carried out directly under the supervision and control of management.

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

- ✓ Road signs will be provided at each, and every turning point up to the main road (wherever required)
- ✓ To avoid danger while reversing the vehicles especially at working place/loading points, stopper should be posted to properly guide reversing/spotting operating.
- ✓ Only trained drivers will be hired.
- ✓ All transportation within applied mining lease working will be carried out directly under the supervision and control of the management.
- ✓ Regular training will be provided to the operators by the Company or the Contractors.

There will be some emission from combustion of fossil fuel from vehicles to be used for transportation of mineral and mining machinery. All vehicles and machinery (excavators) will be maintained regularly. Proper mitigation measures such as regular water sprinkling on haul roads, etc. will be done to suppress the air borne dust. PPEs will be provided to the workers working nearby dust prone areas. Also, greenbelt/ plantation will be developed around the mining activity area to arrest the air borne dust.

7.4.1.5. Measures to Prevent Dangerous Incidents during Inundation/ Flooding

i. Inundation or flooding is expected and beneficial for these sand mines as during this time only the sand reserve gets replenished.
ii. During monsoon months and heavy rains, the sand mining operations are ceased.
iii. The Trucks and other vehicle plying over the dunes will be kept on the riverbanks beyond HFL.
iv. The workers are not allowed to go over the dunes during heavy rains.
v. There will be mechanism/warning system of heavy rains and discharges from the upstream dams.

7.4.1.6. Measures to Prevent Slope Failure

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

i. Flatter slope angles are adopted where occurrences of loose earth are encountered.
ii. Unmanageable heights are not created.
iii. Loose rocks are properly dressed.
iv. Nature and structure of the rocks are properly studied for their slips.
v. Bench height will be kept with respect to the digging depth of excavating equipment.
vi. No overhang/ under cutting will be allowed to be created in benches by the excavating equipment.
vii. Overloading of dumpers/trucks will not be allowed. Large size of material will not be loaded at the top of the dumpers to prevent its falling and causing injury to persons.
viii. Sand bed will be left in suitable location while harvesting sand from riverbed.

7.4.1.7. Measures to Prevent Drowning

i. The sand mining will be done under strict supervision.
ii. The workers are not allowed to go to the deeper areas of the rivers.
iii. The workers are not allowed to fish in the river during working hours.
iv. In case it is required to cross the river, it is done under strict supervision and over the shallow area using lifelines.
v. Few life jackets, inflated tubes will be kept near the mine site.

7.4.1.8. Measures to Prevent Occupational Hazard

Table 7-3: Details of Prevent Occupational Hazard

Particulars	Control Measures
Heat & Light	✓ The mine site will have adequate drinking water supply so that workers do not get dehydration. ✓ Lightweight and loose-fitting cloths having light colours will be preferred to wear. ✓ Rigorous exercise and more physical activities will be avoided in hot weather.
Noise	✓ Noise exposure measurements will be taken to determine the need for noise control strategies. ✓ The personal protective equipment will be provided for each mine workers. ✓ Supervisor will be instructed for reporting any problems with hearing protectors or noise control equipment. ✓ At noisy working activity, exposure time will be minimized. ✓ Machineries will be labelled with noise levels.
Respiratory	✓ PPEs like face mask etc. will be provided during mining activity. ✓ Periodic medical examinations will be provided for all workers. ✓ Awareness program will be organized for workers.

7.4.1.9. General Control Measures.

(i) Regular maintenance and testing all the tools & equipment as per manufacturer's guidelines.
(ii) Provision of personal protective equipment to the workers working in the mine.
(iii) Periodical Medical Examination of all workers by medical specialists will be conducted.
(iv) Awareness program will be organized for workers.

7.4.2. Safety, Health & Environmental (SHE) Policy

The Safety, Health and Environmental (SHE) policy has been proposed by developer. The policy has been framed considering legislative compliance, stakeholder involvement, continual improvement, and management by objectives. Towards this commitment, following key principles will be demonstrated:

- ✓ Integrate sound environmental management practices in all our activities by forming an Environmental Management Cell.
- ✓ Progressively adopt cleaner and energy efficient technologies.
- ✓ Conduct our operations in an environmentally responsible manner to comply with applicable legal and other requirements related to its environmental aspects and strive to go beyond.
- ✓ Biodiversity in and around our working areas and mines will be repeated and progressively enhanced for benefit of nature.
- ✓ Strive for continual improvement in our environmental performance by setting challenging targets, measuring progress, taking corrective action, and communicating environmental information to all concerned.
- ✓ Enhance environmental awareness amongst employees working for and on behalf of us and the general populace around working areas and mines.

- ✓ Encourage our business associates to adopt similar approach for environmental protection.

7.4.3. Planning

Disaster Management Plan to be dealt with action plan for higher risk accident like landslide, subsidence flood, inundation underground mines, fire, seismic activities tailing dam failure etc. and emergency plan proposed for quick evacuation, ameliorative measure to be taken etc. Ye capability of lease to meet such eventualities and the assistance to be required from the local authority will be as per Govt. rule. Identification and Prevention of Possible Emergency Situations, Possible emergency situations can broadly be classified into unintended explosions, vehicle collision, and inundation. Additional emergency situations can be developed based on audit or other procedures prior to commencement of operations.

7.4.3.1. Emergency Prevention

Some of the ways of preventing emergencies are as follows:

- ✓ Preparation of a Preventive Maintenance Schedule Program and covering maintenance schedules for all critical equipment's and instruments as per recommendations of the manufacturer's user manuals,
- ✓ Importantly, it is of great importance to collect and analyze information pertaining to minor incidents and accidents at the site, as well as for recording near-misses or emergencies that were averted. This information gives an indication of how likely or unlikely it is for the site to face actual emergency and what shall be further action to prevent them from occurring.
- ✓ Establishment of an ongoing training and evaluation program, incorporating the development of capabilities amongst employees about potential emergencies and ways and means of identifying and averting the same. Most emergencies do not occur without some incident or an abnormal situation. So, there is always sometime of few seconds to few minutes to arrest an incident of abnormal situation from turning in to an emergency. This is the role of the shift in-charge who is the incident controller (IC) along with his shift team.

7.4.3.2. Emergency Plan Objectives

Specific objectives of the Emergency Response Plan are to be clearly listed with regards to the responses desired for successful management of the possible emergency situations. Suggested Objectives are given below:

- ✓ To define and assess emergencies, including risk and environmental impact assessment.
- ✓ To control and contain incidents.
- ✓ To safeguard employees.
- ✓ To minimize damage to property or / and the environment.
- ✓ To inform employees, the public and the authority on the hazards / risks assessed.
- ✓ Safeguard provided residual risk if any and the role to be played by them in the event of emergency.
- ✓ To inform authorities like Safety and Fire Dept and Mutual Aid Centres to come up for help.
- ✓ For effective rescue and treatment of casualties and to count the injured.
- ✓ To identify and list fatal accidents if any.
- ✓ To secure the safe rehabilitation of affected areas and to restore normally.

- ✓ To provide authoritative information to the news media.
- ✓ To preserve records, equipment's etc. and to organize investigation into the cause of the emergency and preventive measures to stop its recurrence.
- ✓ To ensure safety of staff and patients and resume work.
- ✓ To work out a plan with all provisions to handle emergencies and to provide for emergency.
- ✓ Preparedness and the periodical rehearsal of the plan.
- ✓ The objectives are suggested in emergency preparedness plan. Responsibilities, resources, and timeframes require to be allocated for implementing the objectives.

7.4.4. Implementation of Occupational Health & Safety Measures

Occupational Health & Safety measures result in improving the conditions under which workers are employed and work. It improves not only their physical efficiency, but also provides protection to their life and limb. Management will consider the following safety measures:

- ✓ Safety clauses in contract order.
- ✓ Dedicated Environment Health and Safety system.
- ✓ Inspection and maintenance of equipment's and accessories.
- ✓ Preplacement and periodic health check-up.
- ✓ Removal of unsafe conditions and prevention of unsafe acts.
- ✓ Detailed analysis of each incident.
- ✓ To provide standard PPEs and ensure its uses for mining safety.
- ✓ Periodic inspection by internal and external safety experts.
- ✓ Celebrations of various safety events for awareness.
- ✓ Medical facilities & first aid boxes will be established in the mine premises.
- ✓ Pits, Sumps, openings in floor etc. which may be a source of danger, will be either securely covered or securely fenced. Securely fencing a pit means covering or fencing it in such a way that it ceases to be a source of danger.
- ✓ Health Awareness Programmes and camps will be organized.
- ✓ The mine workers will be provided all necessary PPE, especially dust masks for their safe.
- ✓ guard from dust, Ear Plugs/Earmuffs for noise, boots etc. and measures for other hazards.
- ✓ Under initial vocational training, the workers will be given training related to all safety and health aspects.

7.4.5. Annual Replenishment of Mineral

Fully operational mining with simultaneous reclamation and pollution free mining method shall be adopted. River sand used for construction industry is available all along the river Yamuna in the plains of Haryana. Yamuna River flows along some major towns of Haryana from North to South like Yamuna Nagar, Karnal, Panipat, Sonipat, Faridabad and Palwal.

The sand is a minor mineral and falls under the preview of the Mines and Geology Department, State of Haryana. Mine lease area will be worked in blocks for ease of operation. However, as the digging depth will be restricted to 3.0 m only, material will still be available below. This will be further replenished during rainy season. Blocks will be worked systematically as the width is limited while length is much more.

7.4.6. Rehabilitation and Resettlement

There is no displacement of the population within the project area and the adjacent nearby area, and the complete lease area is a Govt. land. However Social development of the village will be considered as per social activities.

7.5. Conclusion & Summary

Riverbed Mining does not involve hazardous process with no risk related to Fire and Explosion. Risk assessments will help mine operators to identify high, medium, and low risk levels. This is a requirement of the Occupational Health and Safety Act 2000 with amendment on 2020 as The Occupational Safety, Health, and Working Conditions Code, 2020.

Risk assessments will help to priorities the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements.

There is no displacement of the population within the project area and adjacent nearby area. From the above, it will be observed that during the working of the mine, no problems are likely to crop up that will cause any harm to environment, ecology of the area etc.

This working of mine will offer more employment, chances to some of the nearby population, it is always obvious that the safe mining activity will help to improve socio-economic conditions of the inhabitants.

CHAPTER – 08

PROJECT BENEFITS

8. Project Benefits

8.1. Introduction

The execution of the project brings overall improvement in the locality, neighbourhood, and the State by bringing up to industry, roads, infrastructure sectors and employment generation at local level. Hence it will be helpful for the economic growth and support to enhance quality of life through employment.

8.2. Physical Benefits

Following physical infrastructure facilities will be improved in the adjoining areas by the proposed project:

Table 8-1: Project Benefits in Respect to Different Aspects

Aspect	Project Benefits
Road Transport	Construction of approach road and maintenance of existing transportation facility will be done for the proposed project. There is separate budget has been mentioned under the EMP head.
Market	By improving the economic status of local habitants through employments will attract market to develop their facilities and services near to the project site it's a part of indirect employment which will be developed due to the proposed project.
Infrastructure	Proposed project will provide the raw material for the infrastructure development like road, building etc.
Plantation or Greenbelt Development	Plantation is a major thrust area in pollution control of mining. Plantation is suitable for detecting, recognizing, and reducing air pollution effects. Trees function as sinks of air pollution, besides their bio-aesthetical values, owing to its large surface area. The green belt supplements oxygen to the atmosphere and combat air pollution effectively. It not only improves the aesthetic beauty and landscape resulting in harmonizing and amalgamating the physical structure of the mines with surrounding environment, but also acts as pollution sink as indicated above. Thus, plantation is of paramount importance. It also checks soil erosion, make the eco-system more complex and functionally stable and make the climate more conductive. Fast growing plant species will be preferred. The plant will be of deep rooting system. The plant will be perennially green to improve the aesthetic beauty of the area. The plant species will be adopted to the local climatic condition. Native plant species will be planted. A suitable combination of trees (total 7900) that can grow fast and have good leaf cover to contain dust pollution shall be adopted to develop greenbelt. Greenbelt development will be done wherever possible. Plantation will be done within first 2 years and in later years maintenance will be ensured. The gap plants also will be ensured to complete the numbers of total plants.
Local Employment	The project proponent is conscious of its social responsibility and as any good corporate citizen; it is proposed to undertake the need specific (skilled & non-skilled) employment. This Project will provide employment to local people directly and indirectly. Indirect employers are shopkeepers, mechanic, drivers, transporters etc. About 67 persons will get direct employment and 20 persons will get indirect employment form nearby villages. The workers will be mostly skilled.

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

8.3. Budget allocation for EMP

The company will regularly evaluate the aspects of company operations that impact the environment. Opencast areas targeted for improvement are selected based on several factors, including changes in the regulatory environment, breadth of impact, impact on our customers and other stakeholders, and financial considerations. Management periodically reviews proponent's progress towards mitigating adverse environmental impacts, appropriate actions will be taken that are designed to ensure the success of our proposed project. In line to the OM date 30.09.2020, the commitment approached during public hearing will be addressed in report with allocated budget to the region.

8.4. Summary

The management will recruit the semi-skilled and unskilled workers from the nearby villages as demanding employment is 67 direct and 20 indirect. The project activity and the management will support the local Panchayat and provide other form of assistance for the development of public amenities in this region. The company management will contribute to the local schools, dispensaries for the welfare of the villagers. A suitable combination of trees that can grow fast and have good leaf cover will be adopted to develop the green belt.

CHAPTER – 09

ENVIRONMENT COST BENEFIT ANALYSIS

9. Environmental Cost Benefit Analysis

As per ToR granted by SEIAA Haryana Cost Benefit Analysis study is not required for the proposed project.

CHAPTER – 10

ENVIRONMENTAL MANAGEMENT PLAN

10. Environment Management Plan

10.1. 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. An Environmental Management Plan (EMP) is a site-specific plan developed to ensure that the project is implemented in an environmentally sustainable manner. An effective EMP ensures the application of best practice environment management to a project.

Table 10-1: Purpose & Design of Environment Management Plan

Purpose of EMP	Design of EMP
✓ Assists proponent in the preparation of an effective and user-friendly EMP.	✓ To ensure adoption of state of art technological environmental control measures and implementing them satisfactorily.
✓ Improve the contribution that an EMP can make to the effectiveness of the environmental management process.	✓ Effectiveness of mitigation measures in mitigation of impacts.
✓ Ensure a minimum standard and consistent approach to the preparation of EMP's.	✓ Description of monitoring program of the surrounding environment.
✓ Ensure that the commitments made as part of the project's EIA are implemented throughout the project life.	✓ Institution arrangements to monitor effectively and take suitable corrective steps for implementation of proper EMP.
✓ Ensure that environment management details are captured and documented at all stages of the project.	✓ An Environmental Management Cell (EMC) should be set up to take care of all environment aspects and to maintain environmental quality in the project area.

10.2. Land Use Pattern

Deviation from planned mining procedure can lead to soil erosion/cutting and thereby degradation of land, causing loss of properties and degradation surrounding of landscape. Thus, for environmentally friendly major mining the following control / abatement measures will be followed:

- ✓ Mineral will be mined out in from the mine lease area and sufficient safety barrier should be taken during mining.
- ✓ Land use plan of mine lease area should be prepared to encompass pre-operational, operational and post operation phases and submitted.

10.3. Air Environment Management

Mitigative measures suggested for air emission control will be based on the baseline ambient air quality monitoring data. From the point of view of maintenance of an acceptable ambient air quality in the region, it is desirable that the air quality needs to be monitored on a regular basis to check it with reference t0 the NAAQS 2009 prescribed by MoEF&CC. To minimize impacts of mining on air and to maintain it within the prescribed limits of CPCB/ SPCB, an Environmental Management Plan (EMP) has been prepared. This will help in resolving all environmental and ecological issues likely to cause due to mining in the area. During mining no, toxic substances are released into the atmosphere as such there seems to be no potential threat to health of human

beings. In the mining activities, the source of gaseous emissions is engines of vehicles, Operation of mining machinery/ loading / unloading and transportation. The reasons may be quality of fuel, improper operation of the engine, etc.; proper maintenance of engines will improve combustion process and brings reduction in pollution.

Table 10-2: Air Pollution, Management & Monitoring

S. No.	Particular	Description / Management
1	Control of Gaseous Pollution	✓ The only source of gaseous emissions is from engines of Heavy earth moving machines (HEMM). ✓ The emissions from the diesel engines of the machinery can be controlled by proper maintenance and monitoring of machines.
2	Control of Dust Pollution	✓ The main pollutant in air is Particulate Matter, which is generated due to various mining activities like, mineral loading, unloading & transportation etc. ✓ However, to reduce the impact of dust pollution the following steps have been taken during various mining activities.
	During Loading Operation	✓ The propagation of this dust is confined to loading point only and does not affect any person both the operators of excavator and dumpers who will sit in closed chamber and will be equipped with dust mask. ✓ Skilled operators will operate excavators. ✓ Avoid overloading of dumpers and consequent spillage on the roads. ✓ The operators' cabin in the dumpers will be provided with dust free enclosure and persons working at high dust prone areas will be provided with dust mask.
	During Transport Operation	✓ All the haulage roads including the main ramp be kept wide, levelled, compacted, and properly maintained and watered regularly twice a day during the operation to prevent generation of dust due to movement of dumpers, and other vehicles. ✓ Mineral carrying trucks will be effectively covered by Tarpaulin to avoid escape of fines to atmosphere. ✓ Regular Compaction and grading of haul roads to clear accumulation of loose material.
3	Plantation Work Carried Out	✓ To reduce air pollution in the surroundings, green belt will be developed on both siderophile approach road and nearby villages.
4	Monitoring of Air Pollution	✓ Air quality will be regularly monitored both in the core zone and the buffer zone. ✓ Periodic air quality survey will be carried out to monitor the changes consequent upon mining activities as per the norms of State Pollution Control Board.

10.4. Noise Level Environment and Vibration

The ambient noise level monitoring carried out in and around the proposed mine lease area shows that ambient noise levels are well within the stipulated limits of MoEF&CC. There is no drilling or blasting for mineral extraction. Noise pollution will only be due to loading and transporting equipment, which cause some problem to the inhabitants of this area because there is human settlement near the link roads in lease area. Effective steps will be taken to keep the noise level

well below the DGMS prescribed limit of 85 dB(A). That ambient noise levels are well within the stipulated limits of MoEF&CC.

Table 10-3: Noise Level Pollution, Management & Monitoring

S. No.	Particular	Description / Management
1	Noise Pollution and Control	✓ All the machineries including transport vehicles will be properly maintained to minimize generation of noise. ✓ Silencers in the machineries will be provided to reduce generation of noise. ✓ Attenuation between source and receive points will be encased. ✓ Dense plantation in safety zone of mining area will also reduce propagation of noise outside the core zone. ✓ 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 arrests dust.

10.5. Water Management

There will be no wastewater generation from the mining operations. Only wastewater generation will be sanitary /municipal wastewater, which will be treated in septic tank followed by subsurface dispersion.

Table 10-4: Water Pollution & Management

S. No.	Particular	Description / Management
1	Surface Water	✓ Safety zone will be left on both riverbank and no wastewater generate in operation. ✓ Site office will be setup in ancillary area which are near to riverbank and the waste generated from the site office will not contaminate the river stream.
2	Ground Water	✓ Mining will not intersect the ground water table of the area. So, it will not disturb water environment. ✓ Mining will not be operational in rainy season. ✓ At the end of mining, no pit will be available on site as mined-out area will be automatically replenished in monsoon season.
3	Wastewater	✓ A small amount of wastewater 0.6 KLD will be generated from domestic demand of water which will be stored in septic tanks within lease area.
4	Water Conservation	✓ The project does not consume any process water except for drinking, dust suppression and plantation. Plantation is proposed, which will increase the water holding capacity and help in recharging of ground water.

10.6. Solid Waste Management

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

Generated food waste or any other domestic waste will be collected in dustbins and will be properly disposed-off. There are no toxic elements present in the mineral, which may contaminate the soil water.

This is the sandmining project from the riverbed so no solid waste will be generated as bi product. If some soil would be available on site, it will be utilized for bund development and plantation purpose.

10.7. Green Belt Development

A suitable combination of trees that can grow fast and have good leaf cover to contain dust pollution shall be adopted to develop greenbelt. Greenbelt development will be done wherever possible. Plantation will be done within first 2 years and in later years maintenance will be ensured. The gap plants also will be ensured to complete the numbers of total plants. Details of proposed plantation are given below:

Table 10-5: Plantation Details

Year	Plantation Proposed	Survival 80%	Gap Plantation	Species	Place of Plantation
I	3950	3160	-	Neem, Peepal, Mango, Shisham, Sirish, Babool, Gulmohar and other local fruity plants	Along the haul roads, Along the riverbanks in schools and public building and other social forestry programme.
II	3950	3160	790		
III	-	-	790		
IV	-	-	-		
V	-	-	-		
Total	**7900**	**6320**	**1580**		

Table 10-6: Post Plantation Care

Particular	Description / Management
Protection from Grazing and Fire	Fencing will be provided around the area where mass plantation has been proposed. This will help in preventing cattle from entering such area and will protect unauthorized entry of out-side person. Due to care will be taken to protect plantation as well as the fencing by the guards.
Watering During Dry Season	During dry spell, water will be sprinkled using private water tanker provided with hose pipes.
Manuring	Initially fertilizer/ manure will be given to the plants before and after plantation. Thereafter, manuring will be continued on reduced scale till the plant attains growth of 2 to 3m height. Provision of utilizing bio-manure will also be made within the lease area.
Weeding and Soil Working	Man, power will be engaged in mulching the soil frequently along with removal of weeds and other unwanted species.

10.8. Socio-economic Assurance

The project proponent is aware of his duty and responsibility towards the socio- economic development of the local community where the project activities will be carried. The proponent is also bound by the national policies and is vigorously passionate to carry out some initiative towards the society by improving their quality of life and fostering sustainable and integrated development in the communities in the vicinity of the lease area.

This objective of social responsibility is equally well-entrenched in the minds of the project proponent which is manifest from some of the ESR activities included in the mine plan. The project proponent wishes to play an active part in providing financial support and empowering rural communities to chart their own development.

10.8.1. Environmental & Social Responsibility

The activities to be carried out under Environment & Social Responsibility initiatives will have a positive impact on socio economic fabric of the region. The Project Proponent may promote local NGO, ask the communities to prepare their micro level plans based on genuine needs. It is, therefore, proposed to have ESR plan focusing on following broad areas of activities that addresses the problems and needs of the community in the project area in a holistic manner:

Livelihood and Entrepreneurship: Helping rural communities in Sultanpur Atwa near the project vicinity to become self-sufficient and sustainable by providing training in self-employment and supporting entrepreneurship and implement rainwater harvesting in the villages.

Skill Development: A driving social change in rural areas by empowering local people through education and training and promoting their Self-Help Groups (SHG) and micro finance for group, individual and community income generation activities such as tailoring/embroidery classes for women; and Orientation programs for self-employment in collaboration with District Industries Centre and District Rural Development Agencies.

Education: Empowering children and adults can be done by bringing quality education to remote rural areas. Under the plan it is proposed to provide assistance to local schools and scholarship.

Sports: Under the plan it is proposed to promote sports in the school as well as villages for which sports material shall be supplied to the schools / panchayats.

Environment: Promotion of environmental awareness and responsibility amongst rural, socially backward, and poor communities should be encouraged. In the light of "Swachh Bharat Abhiyan" it is proposed to construct separate toilets for boys and girls in gram panchayat and schools. It is also proposed to provide safe/ treated drinking water in villages by installing RO Plant in village Panchayat Bhawan.

Health: Provide affordable, quality healthcare to villages by giving community level health care training through village workers especially women. Under the plan it is proposed to provide drinking and sanitation facility to local panchayat.

Energy Saving Devices: It is proposed to install roof top solar panel in gram Panchayat Bhawan and in other government building for their lighting as well as street lighting.

10.8.2. Litigations against the Project Proponent

No tree cutting will be proposed in the proposed sand mining project. Lease is allotted by state govt, and no litigation is pending toward project proponent.

10.8.3. Occupational Health and Safety

Occupational Health and Safety professionals develop and coordinate safety and health systems and strategies within organizations. They identify workplace hazards, assess risks to employee health and safety, and recommend solutions. Increasingly, Health and Safety Professionals are also responsible for many of the environmental aspects of their workplace.

Boulder, Gravel, and Sand mining does not contain any toxic element. Therefore, the likelihood of any health hazard does not arise due to the mined product per se. However, the process of excavation / quarrying leads to some health hazards. The dust generated due to loading / unloading and movement on haul road creates air borne dust which has silica contents. The dust is the main pollutant of concern for the workers engaged in the mining activities. The most significant occupational health impacts are Noise Induced Hearing Loss (NIHL) and Occupational

Lung Disease (OLD) like allergic rhinitis and asthma due to inhalation of dust. Working in open during summer can expose workers to the direct sun rays causing heat strokes, cramps and burns besides leading to exhaustion. In extreme windy conditions the dust particles forcing way into the eyes can create itching as well as allergic conjunctivitis of eye. As per Mines Rules, 1955, Chapter – IV-A, Section 29B, medical examination of employees at the initial stage and periodically, shall be done by a team of qualified medical officers provided by the project proponent.

As this profession matures there is an increased emphasis on risk management strategy and on the development of workplace culture. Occupational Health and Safety professionals in the minerals industry may perform the following tasks:

- ✓ The collection of minor minerals does not cause any occupational ill effects.
- ✓ Except fugitive dust generation there is no source which can show a probability for health-related diseases and proper dust suppression will control dust generation and dispersion.
- ✓ Dust masks will be provided to the workers working in the dust prone areas as additional personal protective equipment.
- ✓ Earmuffs will be provided for the workers avoid any noise induced hearing loss.
- ✓ There will be regular health camps for all workers and nearby rural people. Lung function tests, chest x-rays etc. shall be carried out and any health disorders will be evaluated. The budget shall be earmarked for the necessary protective devices and training needs by the project proponent.
- ✓ Awareness program will be conducted about likely occupational health hazards to have preventive action in place.
- ✓ Any workers health related problem will be properly addressed.
- ✓ Periodical medical check-up will be conducted.
- ✓ Promote occupational health and safety within their organization and develop safer and healthier ways of working.
- ✓ Coordinate emergency procedures, mine rescues, firefighting and first aid crews.
- ✓ Communicate frequently with management to report on the status of the health and safety strategy and risk management strategy, and develop occupational health and safety strategies and systems, including policies, procedures, and manuals.

10.9. Financial Assurance

Total 33.42 ha area will be put in use up to the end of the plan period. Details of area put in use as given below (As per circular No.4/2006 issued by CCOM, Nagpur following table has been considered for calculation for financial assurance). Against this mined out area the total financial assurance (@15,000/- per ha. Comes out to Rs 5,01,300 / which will be deposited in the form of Surety bond/ bank guarantee to the Director Mines & Geology Haryana. Total project cost is INR 10.18 crores and CA certificate is enclosed as **Annex 10.1**.

Table 10-7: Financial Assurance Calculation

S. No.	Item	Area Present	End of Plan	Total Area	Fully Reclamation	Net Area Calculated
		(A)	-	(B)	(C)	D = (B-C)
1.	Area to be excavated	0.0	20.02	20.02	0.0	20.02
2.	Storage for topsoil	0.0	0.0	0.0	0.0	0.0
3.	Overburden/ dumps	0.0	0.0	0.0	0.0	0.0

S. No.	Item	Area Present	End of Plan	Total Area	Fully Reclamation	Net Area Calculated
		(A)	-	(B)	(C)	D = (B-C)
4.	Mineral storage	0.0	8.35	8.35	0.0	8.35
5.	Infra (Workshop, Admin Building & Road)	-	0.50	0.50	0.50	0.00
6.	Safety zones	0.0	5.04	5.04	0.0	5.04
7.	Green belt (Ancillary area & Riverbank) *	0.0	2.0*	2.00	2.00	0.0
8.	Tailing pond	0.0	0.0	0.0	0.0	0.0
9.	Effluent treatment plan	0.0	0.0	0.0	0.0	0.0
10.	Mineral separation plant	0.0	0.0	0.0	0.0	0.0
11.	Township area	0.0	0.0	0.0	0.0	0.0
12.	Others to specify	0.0	0.0	0.0	0.0	0.0
Total		**0.0**	**33.42**	**33.42**	**0.0**	**33.42**

The broad activities proposed under ESR initiative along with financial implications and year wise allocation of funds is shown in Table 10.8.

Table 10-8: Facilities & Budget under ESR Initiatives (Yearly in lakh)

S. No.	Description	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total Budget
1	Health check-up camps	1.5	1.5	1.75	1.75	1.75	8.25
2	Insurance cover of workers	2	2	2	2.5	3	11.5
3	Assistance to local schools, scholarship to students	1.5	1	1.75	2	2	8.25
4	Sanitations and drinking water facilitate	1.75	1.75	1.75	2	2	9.25
5	Vocational training to persons for income generation	0.75	0.75	0.75	0.75	0.75	3.75
6	Assistance to self-help groups	1	1.5	2	2	2	8.5
Total		**8.5**	**8.5**	**10**	**11**	**11.5**	**49.5**

10.10. Environment Management Protection Plan (EMP)

Following provisions will be adopted for improving, controlling, and monitoring of environment protection measures. Management will also be monitoring the related concerns and its implementation. All the activities will be done by Environment Monitoring Cell (EMC).

Table 10-9: Environment Management Budget

S. No.	Particulars	Capital Cost	Recurring Cost	Total Cost
1	Pollution monitoring – Air, Water, Noise	₹ 0	₹ 60,000	₹ 3,00,000
2	Pollution Control – Water sprinkling	₹ 5,00,000	₹ 2,00,000	₹ 15,00,000
3	Wire fencing at plantation sites	₹ 2,00,000	₹ 50,000	₹ 4,50,000
4	Plantation including maintenance	₹ 6,00,000	₹ 60,000	₹ 9,00,000
5	Rainwater harvesting	₹ 3,00,000	₹ 20,000	₹ 4,00,000

S. No.	Particulars	Capital Cost	Recurring Cost	Total Cost
6	Haul road and other roads repair and maintenance	₹ 10,00,000	₹ 2,00,000	₹ 20,00,000
7	Pre-monsoon and post monsoon survey for sedimentation in the riverbed	₹ 0	₹ 1,00,000	₹ 5,00,000
Total		**₹ 26,00,000**	**₹ 6,90,000**	**₹ 60,50,000**

10.11. Rehabilitation and Resettlement (R&R)

There is no displacement of the population within the project area. However Social development of nearby villages will be considered as per social activities.

10.12. Summary

As per above discussion there is no major impact on the environment due to mining except fugitive emission during loading, unloading of mineral & transportation. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. It is proposed to plant about 7,900 saplings and gap plantation considering 1000 / plant including maintenance and fencing. It will prove an effective pollution mitigate technique and help avoid soil erosion during monsoon season. Employment opportunities will be provided to the locals only as providing extraction of minerals from the mine site is the only prevailing occupation for them for their livelihood. Plantation development will be carried out in the mine premises, along the approach roads, around Govt. buildings, schools approx.

CHAPTER – 11

SUMMARY & CONCLUSION

11. Summary & Conclusion

11.1. General

M/s M. M. Traders is proposing the sand mine project on riverbed of Yamuna River. Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River with 10,80,000 MT/ year production over an area of 33.42 ha located at Village Sultanpur, Tehsil & District Palwal and State Haryana.

Table 11–1: Approvals / Permissions from Concerned Authorities

NOCs	Approval / Permission Details	Annex. No.
Lease Grant	Letter of Intent has been issued by the Director Mines & Geology Haryana vide letter no. **DMG/HY/SULTANPUR UNIT/PALWAL/2022/5242 PANCHKULA dated 17-08-2022** for Mining of Sand (Minor Mineral) in Sultanpur Unit, comprising Sultanpur & Atwa villages over an area of 33.42 hectares in district Palwal, Haryana for a period of 8 years.	Annex 1.1
Cluster NOC	The information was asked about other mines coming within 500m radius from the lease from Department of Mines and Geology, Faridabad. The clarification from department vide letter **MO/FBD/6926 dated 29.08.2022** confirms there is no other mining activity within 500m from project lease boundary to form mining cluster. So, it is individual project in the area.	Annex 1.2
Mining Plan	As per rule 70 of Haryana Minor Mineral Concession, Stocking, Transportation of Minerals & Presentation of Illegal Mining Rule, 2012, the mining plan was submitted to department and mining plan was approved vide reference no. **DMG/HG/SULTANPUR UNIT/2022/6375-6378 DATED 18.10.2022**.	Annex 1.3
Forest NOC	Clarification for No forest involved in proposed lease for both pits have been obtained vide **Reference No. (SRN): QC6-9N2-V919 dated 28.09.2022** for Sultanpur unit & **Reference No. (SRN): XU8-D8R-RJVJ dated 28.09.2022** for Atwa unit.	Annex 1.4

Table 11–2: Salient Features of Mine

S. No.	Parameters	Description
20.	Name of the project	Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit)
21.	Nature & category of Mine	Non-Coal Mining Category 'B' of Activity 1(B)
22.	Project Proponent	M/s M. M. Traders
23.	Khasra No.	**For Mining (Sultanpur Unit)** 122/9// 9 min, 122/3// 3 min, 4, 5, 6, 7, 8 min, 14 min, 15, 16 min, 122/4// 10, 11, 12, 13, 16, 17, 18, 19, 20 min, 21, 22 min, 23 min, 24, 25, 122/ 5// 2, 3 min, 4, 5, 6, 7 min, 8, 14 min, 15 min, 122 min. For Ancillary area (Sultanpur Unit) 122/3// 11, 12, 19, 20, 21, 22, 122/6// 1, 2, 122//2 15, 16/1, 16/2, 25. **For Mining (Atwa Unit)** 9// 10 min, 11 min, 12 min, 13 min, 16 min, 17 min, 18, 19, 20, 21 min, 22 min, 23, 24, 25 8// 21 min, 22 min, 24 min, 25 min 15//, 2 min, 3 min, 4 min, 5, 6 min, 16//, 1, 2 min, 9 min, 10 10//, 4 min, 6 min, 7 min, 14 min, 15, 16 min, 17 min, 25/2 min. For Ancillary area (Atwa Unit)

S. No.	Parameters	Description		
		14// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.		
24.	Total Lease area	33.42 Ha (Riverbed of Yamuna River)		
25.	Location of the project	Village- Sultanpur & Atwa, Taluk- Sultanpur, District- Palwal, Haryana		
26.	Toposheet No.	H43X8 - Project Site & H43X8, H43X12, G43F5 & G43F9 - Study Area.		
27.	Maximum Production Capacity	10,80,000 Metric Tonne / Year		
28.	Geological Mineral Reserve	13,53,456 Metric Tonne		
29.	Mineable Reserve	10,81,296 Metric Tonne		
30.	Geographical co-ordinates	**Point**	**Longitude**	**Latitude**
		SULTANPUR UNIT		
		G	28°03'56.67"N	77°29'6.04"E
		H	28°03'52.15"N	77°29'15.54"E
		I	28°03'48.25"N	77°29'10.35"E
		J	28°03'51.96"N	77°29'3.58"E
		Q	28°03'44.13"N	77°29'31.61"E
		R	28°03'36.68"N	77°29'27.15"E
		S	28°03'50.19"N	77°29'13.46"E
		ATWA UNIT		
		Q	28°01'58.42"N	77°30'17.83"E
		Q1	28°01'54.90"N	77°30'16.70"E
		R	28°01'56.46"N	77°30'24.26"E
		R1	28°01'52.50"N	77°30'23.70"E
		S	28°01'54.77"N	77°30'30.78"E
		S1	28°01'51.20"N	77°30'28.90"E
		T	28°01'52.97"N	77°30'36.54"E
		T1	28°01'49.00"N	77°30'36.20"E
		U	28°01'52.09"N	77°30'41.27"E
		U1	28°01'48.30"N	77°30'41.60"E
31.	Topography of ML area	Highest elevation in riverbed at extreme north end is 181.30mRL and bank top level is 184.0 mRL whereas the levels at the extreme south end in riverbed is 176.00mRL and Riverbank top is 179.00 mRL. The Yamuna River flows from NW to SE direction in Sultanpur revenue village whereas its direction of flow in Atwa area riverbed is almost west to east.		
32.	Mining Method & Technology	Opencast manual method will be adopted. No specific method of exploration is required as the river borne sediments are deposited all along the riverbed and are very well exposed on the surface. Moreover, these sediments are accumulated/ replenished every year during rainy season by flood waters to almost the same level depending on the intensity of rains on the upstream side. Adequate quantity of sand reserves is available for meeting consumer demand.		
33.	Ultimate depth of Mining	3 m from the riverbed of Yamuna River		
34.	Ground water level	05 - 10 m from the surface level		
35.	GWT intersection	Mining will be done only up to 3m from surface. So, ground water table will not be intersected.		

<table>
<tr><th>S. No.</th><th>Parameters</th><th>Description</th></tr>
<tr><td>36.</td><td>Drainage pattern/ water courses</td><td>Mining will be done in dry riverbed; stream will not be touched and will be done only during non-monsoon period.</td></tr>
<tr><td>37.</td><td>Water requirement & source</td><td>The source of water is private water tankers. The break-up of water requirement is as follows:
<table>
<tr><th>S. No.</th><th>Description</th><th>Demand</th></tr>
<tr><td>1</td><td>Dust Suppression</td><td>29.3 KLD</td></tr>
<tr><td>2</td><td>Greenbelt Development</td><td>7.9 KLD</td></tr>
<tr><td>3</td><td>Domestic Requirement</td><td>3.0 KLD</td></tr>
<tr><td colspan="2">Total</td><td>40.2 KLD</td></tr>
</table></td></tr>
<tr><td>38.</td><td>Cost of project</td><td>The capital cost for the project will be Rs. 10.18 Crores and machinery will be hired on contract bases.</td></tr>
</table>

Source: Approved Mining Plan

11.2. Analysis of Alternative

It is case of fresh quarry lease. The mineral is site specific, so no alternative site was identified. Lease approval from concerned authority has been obtained and enclosed in report.

11.3. Description of Baseline Environment

Environmental data has been collected during post-monsoon season i.e., October 2022 to December 2022 in accordance with the guidelines for preparation of EIA studies.

Table 11–3: Baseline Status

Parameters	Baseline Status
Ambient Air Quality	PM_{10} particulate matter 10 varying from 38 µg/m^3 to 80 µg/m^3. $PM_{2.5}$ was observed 15 µg/m^3 to 31 µg/m^3. SO_2 was varying from 6.2 µg/m^3 to 10.6 µg/m^3. NOx was observed 10.1 µg/m^3 to 15.2 µg/m^3 in study area. CO was observed from 0.46 mg/m^3 to 1.12 mg/m^3 in study area.
Noise Level	The Sound Pressure Level recorded during the daytime on all locations varies from 37.9 dB(A) to 55.6 dB(A) & in time it varies between 27.4 dB(A) to 40.2 dB(A).
Ground Water	All the parameters were observed mostly exceeding the acceptable limits but well within permissible limits for drinking water standard 10500:2012. pH (7.1 to 7.8), TDS (814 mg/l to 851 mg/l), alkalinity (218.5 mg/l to 274.9 mg/l), Total Hardness (301.2 mg/l to 313.6 mg/l), Calcium as Ca (62.3 mg/l to 72.4 mg/l), Magnesium as Mg (31.6 mg/l to 36.1 mg/l), Chloride (215.0 mg/l to 261.4 mg/l) & Sulphate (52.4 mg/l to 59.2 mg/l) parameters were analysed.
Surface Water	The pH was varying between 7.2 to 7.6. Dissolved Oxygen of the sources was varying between 5.8 to 6.4. BOD was observed 39 mg/l to 46 mg/l. Total Coliform were observed varying between 1400 to 1600 MPN/100ml.
Soil Quality	The soil was predominantly Loamy in the study area. The pH was ranges 7.2 to 8.0. The conductivity was varying from 319 µmhos/cm to 418 µmhos/cm. Organic Carbon was varying from 0.3% to 0.51%. Nitrogen was varying from 138 kg/ha to 193 kg/ha. Phosphorous was varying from 15 kg/ha to 21 kg/ha. Potassium was varying from 109 kg/ha to 124 kg/ha.
Meteorology	The maximum temperature was 35.3°C in the month of October and the minimum temperature was 8.2°C in the month of December. The average wind

Parameters	Baseline Status
	speed recorded was 1.3 m/sec. Predominant wind direction during the study period was mainly SW to NE followed by NE to SW.

11.4. Anticipated Environmental Impact and Mitigation Measures

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. The identified impacts and mitigation measures are detailed below.

- ✓ Total 774 PCU/ day will increase in the existing traffic due to this mining activity hence vehicle collation may occur unwanted sound and can also cause impact on human health of villagers near to transportation route like effect on breathing and respiratory issues. Accidents may occur due to fast movement of vehicles. The truck movement will be from suggested transportation route only. It is proposed to plant 7900 nos. of plants in plan period and water sprinkling will be done twice in a day to reduce the impact.
- ✓ The machinery will be maintained in good running condition so that noise will be reduced to minimum possible level. Vehicles with PUC certificate will be hired. Regular maintenance of vehicles will be done to ensure smooth running of vehicle. Awareness will be imparted to the workers about the permissible noise level and effect of maximum exposure to those levels. In addition, truck drivers will be instructed to make minimum use of horns in the village area and sensitive zones.
- ✓ There will be no impact on water environment as the mining will be limited to 3m only and the water level of project site is 5-10m from the surface. So, no impact on water was identified. Only 0.6 KLD sanitary wastewater will be generated from the proposed mining activity which will be treated in septic tanks and will be used for plantation purpose.
- ✓ The mine worker will generate municipal solid waste of about 16 Kg per day, which will have an adverse impact on human health. There will be 4 Nos. of garbage, provided for domestic waste collection. There will be no overburden due to mining in the riverbed area.
- ✓ The mining activities will be done in a systematic manner by maintaining the road infrastructure and vehicle transport, which will be a protective measure for preserving the topography and drainage in the area.
- ✓ No human settlement is proposed in mining or ancillary area. Local manpower will be preferred.
- ✓ No mining will be carried out during the rainy season to minimize impact on aquatic life.
- ✓ There is only 1 species (**Pea fowl -** *Pavo cristatus*) of Schedule I observed during the study period hence, for the same conservation plan was prepared. Subsequently, a budget of Rs. 10 Lakhs has allotted for the conservation of wildlife species.
- ✓ The mining of Sand is likely to increase the per capita income of local people by which the socioeconomic status of the people will be improved. The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc.

- ✓ Except dust generation, there is no source which can show a probability for health-related diseases. Regular water sprinkling will be done with sprinkles mounted tankers and dust masks will be provided to the workers.
- ✓ Personal protective equipment will provide to prevent the noise exposure. Personal Protective Equipment will be provided during mining activity. Regular Health check-up camps will be organized. All the workers will be insured by employer.

11.5. Environmental Monitoring Program

To maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will have complied as per conditions. For this the lessee has taken decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. A budget for monitoring of Air, water, Noise and Soil will be Rs. 60.0 thousand annual which is to be incurred by the project proponent for undertaking pollution prevention measures during the mining activity.

11.6. Additional Studies

As per proposal made under the mining plan the area will be developed by means of opencast mining method. Water table will not be touched during the mining process. No high-risk accidents like landslides, subsidence flood etc. have been apprehended.

The Safety Health and Environmental (SHE) policy is existing and accessible to all at site and to other stakeholders. The policy has been framed considering legislative compliance, stakeholder involvement, continual improvement, and management by objectives.

To minimize the health impacts PPE like dust masks, ear plugs/ muffs and other equipment will be provided for use by the work personnel. All workers will be subjected to Initial Medical Examination as per Mines Rule 1955 at the time of appointment. Periodical Medical Examination will be conducted at least once in five years. Medical camps will be organized Six Monthly by proponent.

There is no displacement of the population within the project area and adjacent nearby area. This working of mine will offer more employment, chances to some of the nearby population, it is always obvious that the safe mining activity will help to improve socio-economic conditions of the inhabitants.

11.7. Project Benefit

The project proponent is conscious of its social responsibility and as any good corporate citizen; it is proposed to undertake the need specific (skilled & non-skilled) employment. This Project will provide employment to local people directly and indirectly. Indirect employers are shopkeepers, mechanic, drivers, transporters etc. About 67 persons will get direct employment and 20 persons will get indirect employment form nearby villages. The workers will be mostly skilled.

The developer will also adopt the ESR program as per norms and will provide vary facilities the nearby villages. The salient features of the programme are as follows:

- ✓ Social welfare program like provision of medical facilities educational facilities, water supply for the employees as well as for nearby villagers will be taken.
- ✓ A well laid plan for employment of the local people has been prepared by giving priority to local people.

- ✓ Supplementing Govt. efforts in health monitoring camps, social welfare, and various awareness programs among the rural population.
- ✓ Assisting social plantation program.
- ✓ Adoption of villages for general development.
- ✓ Supply of water to village nearby villages.
- ✓ Development of facilities within villages like roads, etc.

11.8. Cost of Environment Management Plan

The detailed activity-wise has been calculated which are INR 26.0 Lakhs as a Capital Cost and INR 6.90 Lakhs per annum as a Recurring cost, respectively. Total budget of INR 60.5 Lakh for environmental measurements has been ensured by the developer.

11.9. Conclusion

As per above discussion there is no major impact on the environment due to mining except fugitive emission during loading, unloading of mineral & transportation. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. It is proposed to plant about 7,900 saplings and gap plantation considering 1000 / plant including maintenance and fencing. It will prove an effective pollution mitigate technique and help avoid soil erosion during monsoon season. Employment opportunities will be provided to the locals only as providing extraction of minerals from the mine site is the only prevailing occupation for them for their livelihood. Plantation development will be carried out in the mine premises, along the approach roads, around Govt. buildings, schools approx.

CHAPTER – 12

DISCLOSURE OF THE CONSULTANT

12. Disclosure of Consultant

12.1. Organizational Profile

PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (PEES), is a NABET accredited firm at 5/916, Viram Khand, Gomti Nagar, Lucknow, Uttar Pradesh-226010.

PEES is accredited by QCI/ NABET as Category-A EIA consultancy organization. The objective of PEES is to revive, support, strengthen and promote the traditional and unconventional technologies, which have survived through ages. These technologies meet our target of achieving the eco-friendly environment in this modern age. For the same cause we, at PEES, take initiatives in associating with national and international institutions, working for the same cause.

PEES is also dedicated to collect, analyze, and disseminate the scientific, technical, and socioeconomic information and knowledge for the benefit of the masses. The advance technology like the Information Technology tools is positively used for a better perspective. In achieving the desired objective in each project, the vital factor of socioeconomic information collation and analysis always plays an indispensable role. PEES have always stood in the front lines in this important area.

To summarize PEES is a group which is inspired and guided by the nature and finds immense pleasure in working on scientific lines with a role of activator between the decision makers and the locals. The active participation of locals through the development of self-help groups is always on top of the main agenda. PEES is dedicated to work in the field of research, development and exploration of traditional technologies and unconventional energy resources. The benefit of these activities is propagated to the end users.

PEES is associated with Asia Enviro Lab, which is NABL Accredited, and MoEF&CC recognized covering vast scope of environmental testing.

12.2. Consultancy Services

• Environmental Impact Assessment	• HAZOP Study
• Air Quality Assessment and Control Measures	• EHS & Occupational Safety Management Consulting
• Water and Wastewater Quality Assessment, Treatment and Management	• Socioeconomic & Impact Assessment
• Soil Quality Assessment	• Solid Waste Management Services
• Remediation Construction & Site Restoration	• Consent Management
• Source apportionment Study	• Environmental Legal Advice
• Carrying Capacity Study	• ETP & STP Establishment and Operation
• Environmental Management Plan	• Natural resource management
• Training and Skill Development	• Environmental Research and Development

12.3. Disclosure of Consultants Engaged

Declaration by Experts contributing to the EIA of Proposed M/s MM Traders proposed a mining project of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ year production over an area of 33.42 ha located at Village Sultanpur & Atwa, Tehsil & District Palwal and State Haryana.

I hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

Table 12–1: EIA Co-ordinator Details

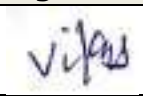
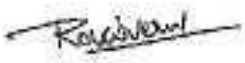
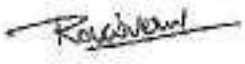
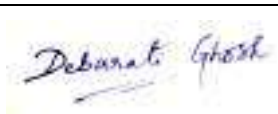
EIA Coordinator		Signature & Date
EIA Coordinator	Vikas Tripathi	 11.01.2023
Period of Involvement	October 2022 to till date	
Contact Information	9990156652 / 9819893405	

Table 12–2: List of Functional Experts

S. No.	Functional Areas	Name of Expert/s	Involvement (Period & Task**)	Signature & Date
1	AP	Vikas Tripathi	➢ Selection of AAQ stations in compliance with CPCB/ MoEF&CC guidelines ➢ Interpretation of baseline data w.r.t CPCB standards ➢ Identification of sources of pollution and its Inventorization. ➢ Preparation of Management plan with budgetary provision for all the sources of pollution. ➢ Suggestion of Operational monitoring program to verify and keep the levels well within the norms from time to time.	
2	WP	Ram Sushil Mishra	➢ Selection of water monitoring locations in line with CPCB norms ➢ Interpretation of baseline data w.r.t to CPCB standards ➢ Identification of pollution sources with relevant Inventorization. ➢ Preparation of Water Balance. ➢ Prediction of water pollution and its management plan.	
3	SHW	Ashish Kumar Vikas Tripathi	➢ Identification of nature of waste, categorization, and quantity of generated waste. ➢ Prediction of waste pollution and preparation of its management.	
4	SE	Kripna Shukla	➢ Collection of Secondary data (Census of India & District Handbook) ➢ Collection of primary data of the study area through Questionnaire method ➢ Compilation and analysis of primary & secondary data to identify the various activities required on need basis.	

S. No.	Functional Areas	Name of Expert/s	Involvement (Period & Task**)	Signature & Date
			➢ Identification and prediction of Socio-economic impacts ➢ Enumerating the benefits of the project in terms of employment, development, etc. ➢ Preparation of Environmental Social Responsibility activities based on the need basis with budgetary provisions in compliance with Companies act and MoEF&CC guidelines	
5	EB	Shilpi Anand Ram Sushil Mishra	➢ Identification of samples and its size based on the present land use and land cover pattern. ➢ Collection of primary data of flora and fauna for the study area with standard methodology and guidelines ➢ Collection of secondary data for cross verification of the primary data ➢ Inventorization and compilation of biological aspects of the study area ➢ Identification and prediction of various impacts on Ecological and biodiversity ➢ Preparation of management plan including greenbelt development plan with budgetary allocation	 
6	HG	Ravindra K. Verma	➢ Collection of secondary data (Ground water Authority) ➢ Interpretation of Water resource evaluation of the area. ➢ Interpretation of Pre-monsoon & Post-monsoon water levels & quality data.	
7	GEO	Ravindra K. Verma	➢ Collection of secondary data with respect to regional and local geology from Ground water Department. ➢ Interpretation of collected data in the report	
8	AQ	Vikas Tripathi	➢ Collection of primary data ➢ Quantification of Air pollution sources (point and line sources)	

S. No.	Functional Areas	Name of Expert/s	Involvement (Period & Task**)	Signature & Date
			➢ Impact prediction using AERMOD View Modelling and its interpretation. ➢ Delineating the Incremental load on the existing scenario ➢ Suggesting management plan with budgetary provision ➢ Suggestion of Operational monitoring program to verify and follow up to keep the levels well within the norms from time to time	
9	NV	Om Krishna Tarun Saharan	➢ Identification and selection of NAAQ monitoring locations. ➢ Collection of primary data (noise quality of the study area) ➢ Identification of Noise pollution sources. ➢ Impact prediction of noise pollution sources and its interpretation ➢ Preparation of management plan with budgetary provision ➢ Suggestion of Operational monitoring program to verify and follow up to keep the levels well within the norms from time to time	
10	LU	Debarati Ghosh	➢ Collection of Primary and secondary data (Topo sheet, satellite imaginary, coordinates of known vectors, etc.) ➢ Geo-referencing the primary data with secondary data using AutoCad, ERDAS, GIS software. ➢ Preparation of Land use and Land cover map ➢ Identification and its Impact prediction (if any)	
11	RH	Ram Sushil Mishra	➢ Identification of risk and hazards ➢ QRA study and prediction of risks involved. ➢ Management of Hazard controls due to chemical storage ➢ Preparation of Disaster Management Plan with Onsite and Offsite Emergency Plan ➢ Delineating firefighting facilities and system	

S. No.	Functional Areas	Name of Expert/s	Involvement (Period & Task**)	Signature & Date
			➢ Preparation of Occupational Health and Safety Management Plan with budgetary allocations.	
12	SC	Shilpi Anand Ram Sushil Mishra*	➢ Collection of primary data ➢ Interpretation of existing quality of soil. ➢ Prediction of Impact and its management (if any).	

Team member *

12.4. Declaration by the Head of the Accredited Consultant Organization

I, Vikas Tripathi, hereby, confirm that the above-mentioned experts prepared the *EIA of* M/s MM Traders proposed a mining project of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ year production over an area of 33.42 ha located at Village Sultanpur & Atwa, Tehsil & District Palwal and State Haryana.

I also confirm that I shall be fully accountable for any misleading information mentioned in this statement.

Signature:

Name: **Vikas Tripathi**

Designation: **Managing Partner**

Name of the EIA Consultant Organization. **PARIVESH ENVIRONMENTAL ENGINEERING SERVICES, Lucknow**

NABET Certificate No. & Issue Date: **NABET/EIA/2124/IA 0092(Rev.01) Validity: - 11-11-2024**

ANNEXURES

ANNEXURES – 1.1

LEASE GRANT LETTER

Through e-mail/Speed Post

From

The Director,
Mines and Geology Haryana,
2nd Floor Plot No. 9, I.T. Park, Sector-22, Panchkula.

To

M/s M.M. Traders,
through Manjeet Kumar, S/o Sh. Ved Parkash,
Village Manglora Quidem, Karnal, Haryana – 132 037

Memo No. DMG/HY/Sultanpur Unit/Palwal/2022/5142
Dated Panchkula, the 17-08-2022

Subject: **Acceptance of the highest bid in respect of the minor mineral Sand contract of "Sultanpur Unit" having tentative area of 62.66 Acre/25.06 hectares in the district Palwal, offered in e-auction held on 26.06.2022/issuance of Letter of Intent (LoI)- regarding.**

You participated in the e-auction held on 26.06.2022 on the e-Auction web portal (https://minesharyana.c1auctions.com/) for grant of mining contract of minor mineral sand mines after accepting the terms and conditions of the auction notice issued vide notification no. DMG/HY/Auction/Palwal/2022/3467 dated 25.05.2022 in order to obtain mining contract of minor mineral sand mine of the district Palwal.

2. You offered the highest bid of Rs. 4,56,00,000/- (Rs. Four Crores Fifty Six Lakhs only) per annum against the Reserve Price of Rs. 4,51,00,000/- for obtaining the Mining Contract of Minor Mineral Mine namely 'Sultanpur Unit' for extraction of 'Sand' having total area of 62.66 Acre/25.06 hectares. The details of the khasra number of the area under above said Mining Unit is attached as Annexure 'A'.

3. You are hereby informed that the State Government has accepted the highest bid of Rs. 4,56,00,000/- per annum offered by you in respect of 'Sultanpur Unit' under the provision of Haryana Minor Mineral Concession, Stocking, Transportation of Minerals & Prevention of Illegal Mining Rules, 2012 (State Rules, 2012). Accordingly, you have become the successful bidder in respect of above said mine.

4. The State Government having accepted the aforementioned highest bid of Rs. 4,56,00,000/- offered by you, the Department is pleased to issue this Letter of Intent (LoI) in your favour in respect of the Mining Unit/area namely 'Sultanpur Unit' subject to the following terms and conditions:

4.1 The period of the contract shall be 08 years and the same shall commence w.e.f. the date of grant of Environmental Clearance by the competent authority and the Consent to Operate (CTO) by the State Pollution Control Board, whichever is later, or on expiry of the period of 12 months from the date of issuance of LoI whichever is earlier;

4.2 You may note that the detail of the area of the mining unit is tentative and was notified on "as is where is basis" (refer condition no. 3.4 of the auction notice) In case of any inadvertent mistake in the area detail/Khasra number etc., the same shall be got rectified/corrected before execution of the contract agreement (refer condition no.3.3 of the auction notice).

4.3 No request regarding reduction in bid amount on account of reduction in land/area of the Mining Block/ Unit, on any other account including that of change in description of Khasra numbers / location etc. at any stage will be entertained on any ground. This shall also include any loss/reduction of area for actual mining for want of compliance of applicable laws/restrictions for mining or part of the contracted area had already been operated in the past. Needless to state that this also includes the changes, if any, as per condition no. 3.4 of the auction notice.

4.4 You offered bid after having gone through the terms and conditions of auction notice and also the applicable Acts and Rules for undertaking mining. The State government shall not be responsible for any kind of loss to you being the highest bidders/contractor at any point of time (before or after grant of contract) on any account including on account of reduction of land/ area/ production/ non grant of permission for mining in part area or otherwise on account of any condition stipulated for undertaking mining by any competent authority.

4.5 The amount of the highest bid i.e. Rs. 4,56,00,000/- (Rs. Four Crores Fifty Six Lakhs only) per annum shall be the "Annual Contract Money" payable by you as the contractor money in the manner prescribed in the contract agreement to be executed on form MC-1 appended to State Rules.

As per orders dated 01.07.2022 of the State Government you will have to open ESCROW ACCOUNT with the Department, wherein all the sale proceed made through e-Rawaana Portal will required to be deposited.

4.6 The above said annual contract money shall be increased at the rate of 10% on completion of each block of three years. Accordingly, the year-wise amount of the annual contract money shall be as per details given below:

Sr. No.	Year of the contract Period	Annual Contract Money [in Rs.]
1	First Year	4,56,00,000
2	Second Year	4,56,00,000
3	Third Year	4,56,00,000
4	Fourth Year	5,01,60,000
5	Fifth Year	5,01,60,000
6	Sixth Year	5,01,60,000
7	Seventh Year	5,51,76,000
8	Eighth Year	5,51,76,000

4.7 As per the terms and conditions of the grant, you are liable to deposit Rs. 1,14,00,000/- i.e. equal to 25% of the annual bid amount as "Security", out of

which you have already deposited an amount of Rs. 45,60,000/- (Rs. Forty Five Lakhs Sixty Thousand only) i.e. equal to 10% of the annual bid amount as 'initial bid security' after the conclusion of e-auction. The balance amount of Rs. 68,48,000/- of the bid security i.e. 15% of the annual bid amount shall be deposited before commencement of the mining operation or before expiry of the period of 12 months from the date of issuance of Letter of Intent (LoI), whichever is earlier;

Provided that in case having taken all steps on your part, if you fails to obtain required environmental clearance and consent to operate(CTO) for undertaking mining operations within the said period of 12 months from the date of issuance of LoI, such letter of intent holder/contractor on a specific application submitted to the Director, at least thirty days prior to the end of the period mentioned above, giving details of the action already taken may seek additional time up to another twelve months, over and above the time of 12 months already allowed for commencement of the period of contract, on payment of a non-refundable fee as per the following:-

1	Extension of further period up to six months	On payment of a non-refundable fee at the rate of one percent per month of the annual bid for each month of requested extension period
2	Extension for a second period up to six months	On payment of a non-refundable fee at the rate of two percent per month of the annual bid for each month of requested extension period
Note: Extension shall be allowed only in month (s) and any request for period less/part of the month shall be summarily rejected and shall apply along with advance amount of the fee for such requested period of extension.		

4.8 You are directed to execute the Contract Agreement in Form MC-1 appended to the State Rules, 2012 within a period of 90 days from the date of order of issuance of this LoI.

Note: 90 days period is for execution of Contract Agreement. Therefore, it is advised to submit draft agreement along with all relevant documents preferably within 45 days, so that agreement could be executed within 90 days after completing all the formalities of scrutiny and verification.

4.9 In case of the Partnership Deed (where bidding entity is a partnership firm) or Articles of Association (where bidding entity is a registered Company) or an Affidavit (where bidding entity is a sole proprietorship firm and the bidder is participating as an individual), no transfer or addition or deletion of the Partners/Directors will be permissible before execution of the agreement;

4.10 The Contract Agreement executed shall be got duly Registered under relevant laws with concerned Registering Authority and you will be liable to pay applicable stamp duty and registration fee etc. as per the applicable rates and as demanded by the Registering Authority/Revenue Department at the time of Registration.

4.11 In case of failure to execute the agreement, after issuance of this acceptance of bid/LOI within the prescribed period of 90 days, this LoI shall be deemed to have been revoked and 10% amount of the highest bid deposited as initial bid security shall be forfeited and you, will be debarred from participation in any future auctions/tenders/competitive bidding process in respect of any area for obtaining mineral concession in the State for a period of 5 years.

4.12 You shall also furnish a solvent surety for a sum equal to the amount of the annual bid for execution of the Agreement. The documents in support of solvency of the surety shall be submitted dully evaluated by the concerned Revenue Authority along with Non Encumbrance Certificate from the concerned Revenue Authority. In case the surety offered by the contractor(s) during the subsistence of the contract is not found solvent, the contractor(s) shall offer another solvent surety and a supplementary deed shall be executed to this effect.

4.13 After execution of agreement, either before commencement of the mining operation or before expiry of the time allowed, if any, as per condition No. 4.7 above, in case of failure to deposit the balance 15% amount towards security (as required under clause 4.7 above), the acceptance of bid/issuance of LoI/execution of agreement shall be deemed to have been revoked and 10% amount deposited towards as initial bid security after the conclusion of auction shall stand forfeited. Further, such bidder shall debarred from participation in any future auctions/Tenders/competitive bidding process in respect of any area for obtaining mineral concession in the State for a period of 5 years.

4.14 You shall be liable to deposit the contract money in advance at monthly intervals as per provisions of Contract Agreement i.e. from the date of commencement of the contract period.

4.15 You shall also deposit/ pay an additional amount equal to 7.5% of the due contract money along with the monthly instalments towards the 'Mines and Mineral Development, Restoration and Rehabilitation Fund.

4.16 You shall also deposit/ pay an additional amount equal to 2.5% of the due contract money along with the monthly instalments towards the 'District Mineral Fund'.

17 You shall also be liable to pay advance Income Tax as per provisions of Section 206(c) of Income Tax Act in addition to contract money, payable as per terms and conditions of contract agreement.

8 On enhancement of the contract money with the expiry of every three years period, you shall deposit the balance amount of security so as to upscale the security amount equal to 10% of the revised annual contract money as applicable for one year with respect to the next block of three years. No interest, whatsoever, shall be payable on the security amount deposited under the prescribed security head of the government;

4.19 You shall prepare a Mining Plan along with the Mine Closure Plan (Progressive & Final) from the Recognized Qualified Person as per chapter 10 of the State Rules, 2012 for the "Mining Unit" and shall not commence mining operations in any area except in accordance with such Mining Plan duly approved by an officer authorised by the Director, Mines & Geology, in this behalf.

4.20 Further, the actual mining will be allowed to be commenced only after prior Environment Clearance is obtained by you as the LoI holder/ Mining contractor for the Mining Unit from the Competent Authority as required under EIA notification dated 14/09/2006 issued by Ministry of Environment, Forests and Climate Change, Government of India or as amended from time to time and also other required approvals for mining including Consent to Establish and Consent to Operate from the Haryana State Pollution Control Board before commencement of actual mining operations.

4.21 You will also be liable to pay the following to the landowners to undertake mining operations:

(a) Annual rent in respect of the land area blocked under the concession but not being operated; and
(b) Rent Plus compensation in respect of the area used for actual mining operations.

4.22 The amount of annual rent and the compensation shall be settled mutually between the landowner and the mining contractor. In case of non-settlement of the rent and compensation, the same shall be decided by the District Collector concerned in accordance with the provisions contained in Chapter 9 of the "State Rules, 2012".

4.23 The total mineral excavated and stacked by the concession holder within the area granted on mining contract shall not exceed three times of the average monthly production as per approved Mining Plan and/or quantity approved under Environmental Clearance, at any point of time.

4.24 The Mining Contractor shall not stock any mineral outside the concession area granted on mining contract, without obtaining a valid Mineral Dealer Licence as per provisions contained in Chapter 14 of the State Rules, 2012.

4.25 The contractor shall not carry out any mining operations in any reserved/ protected forest or any area prohibited by any law in force in India, or prohibited by any authority without obtaining prior permission in writing from such authority or officer authorized in this behalf. In case of refusal of permission by such authority or officer authorised in this behalf, contractor(s) shall not be entitled to claim any relief in payment of contract money on this account.

4.26 Following are the general/ special conditions applicable for excavation of minor mineral(s) from river beds in order to ensure safety of riverbeds, structures and the adjoining areas:

i. No mining would be permissible in a river-bed up to a distance of five times of the span of a bridge structure on up-stream side and ten time the span of such bridge structure on down-stream side, subject to a minimum of 250 meters on the up-stream side and 500 meters on the down-stream side;

ii. There shall be maintained an un-mined block of 50 meters width after every block of 1000 meters over which mining is undertaken or at such distance as may be directed by the Director or any officer authorised by him;

iii. The maximum depth of mining in the river-bed shall not exceed three meters from the un-mined bed level at any point in time with proper bench formation;

iv. Mining shall be restricted within the central 3/4th width of the river/ rivulet;

v. Any other condition(s), as may be required by the Irrigation Department of the state from time to time for river-bed mining in consultation with the Mines & Geology Department, may be made applicable to the mining operations in river-beds.

vi. No mining operation may be carried out from 1st July to 15th September every year (rainy season).

4.27 No mining operation shall be allowed in the urbanize zone of area notified by Town and Country Planning Department. Further, in case of the agriculture zone notified by Town and Country Planning Department mining shall be permissible only after obtaining prior permission from the competent authority;

4.28 The contractor shall not undertake any mining operation in the area granted on mining contract without obtaining requisite permission from the competent authority as required for undertaking mining operations under relevant laws;

4.29 The contractor shall be under obligation to carry out mining in accordance with all other provisions as applicable under the Mines Act, 1952, Mines and Minerals (Development and Regulation) Act, 1957, Indian Explosive Act, 1884, Forest (Conservation) Act, 1980 and Environment (Protection) Act, 1986 and the rules made thereunder, Wild life (Protection) Act, 1972, Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981;

All other terms and conditions shall remain as per auction notice and the provisions of the Mines and Minerals (Development and Regulation) Act, 1957 and Rules made thereunder shall prevail over all the terms and conditions.

Accordingly, you are advised to submit the Draft Contract Agreement along with requisite documents including a solvent surety(s) for a sum equal to the amount of qual bid for execution of the agreement, within a period of 90 days from the date of this bid acceptance letter and the LoI.

Mining Engineer
for Director, Mines & Geology,
Haryana.

Endst. No. DMG/HY/Sultanpur Unit/Palwal/2022/ Dated

A copy is forwarded to the following for information and necessary action please:-

1. Principal Secretary to Government Haryana, Mines and Geology Department.
2. The Chairman, Haryana State Pollution Control Board, Panchkula.
3. The Deputy Commissioner, Palwal.
4. The Mining Officer, Mines & Geology Department, Faridabad. He is directed to ensure that proper and complete 'Draft Contract Agreement Documents' as required are submitted within stipulated period.

Mining Engineer
for Director, Mines & Geology,
Haryana.

Annexure-A

Sr. No.	Name of Mining Unit	Name of the Block/ Village	Details of Khasra Nos.	GPS reading of all corner point taken by HARSAC by using DGPS			Area for mining activity (in acre)	Area for mining activity (in acre)	Area for ancillary activities (in acre)	Total Area of mining unit as per Revenue record (in acre)	Total area as per GPS (in acre)	Total mining area (in hect) [Acre ÷ 2.5]	Reserve Price (in crore)	Period
1	2	3	4	5			6	7	8	9	10	11	12	13
1	Sultanpur	Sultanpur	For Mining 122/3// 2 min, 122/3// 3 min, 4, 5, 6, 7, 8 min, 14 min, 15, 16 min, 122/4// 10, 11, 12, 13, 16, 17, 18, 19, 20 min, 21, 22 min, 23 min, 24, 25, 122/5// 2, 3 min, 4, 5, 6, 7 min, 8, 14 min, 15 min, 122 min. For Ancillary area 122/3// 11, 12, 19, 20, 21, 22, 122/4// 1, 2 123/22 15, 16/1, 16/2, 25	Pillar	Latitude	Longitude	39.25	62.66	13.00	85.54	91.27	25.06	4.51	8
				G	28° 1'56.860"N	77° 29' 6.045"E								
				H	28° 1'52.344"N	77° 29' 11.535"E								
				I	28° 1'48.240"N	77° 29' 10.204"E								
				J	28° 1'51.958"N	77° 29' 1.583"E								
				O	28° 1'44.13"N	77° 29' 31.61"E								
				R	28° 1'36.68"N	77° 29' 27.15"E								
				S	28° 1'50.19"N	77° 29' 13.46"E								
		Atwa	For Mining 9// 10 min, 11 min, 12 min, 13 min, 16 min, 17 min, 18, 19, 20, 21 min, 22 min, 23, 24, 25 8// 21 min, 22 min, 24 min, 25 min 15//, 2 min, 3 min, 4 min, 5, 6 min, 16//, 1, 2 min, 9 min, 10 10//, 4 min, 6 min, 7 min, 14 min, 15, 16 min, 17 min, 25/2 min, For Ancillary area 14// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Pillar	Latitude	Longitude	23.41		9.88					
				Q	28° 1' 58.417"N	77° 30' 17.832"E								
				Q1	28° 1' 54.900"N	77° 30' 16.200"E								
				R	28° 1' 56.464"N	77° 30' 24.256"E								
				R1	28° 1' 53.500"N	77° 30' 23.200"E								
				S	28° 1' 54.767"N	77° 30' 30.784"E								
				S1	28° 1' 51.200"N	77° 30' 28.900"E								
				T	28° 1' 52.919"N	77° 30' 36.540"E								
				T1	28° 1' 49.100"N	77° 30' 35.200"E								
				U	28° 1' 52.095"N	77° 30' 41.268"E								
				U1	28° 1' 48.300"N	77° 30' 41.600"E								

ANNEXURES – 1.2

CLUSTER NOC

2610816/2023/Estt.Br

Department of Mines & Geology, Faridabad

Memo No. :- MO/FBD/ 6926

Dated :- 29/8/22

To

M/s M. M. Traders,
Village Manglora, Near Manjeet Filling Station
Meerut Road, Karnal , Haryana-132001

Subject :- Regarding issuance of cluster certificate with respect to our mining query/project located at village Sultanpur, Tehsil and Distt Palwal(Haryana).

Kindly refer to yout letter no. nil dated 29.08.2022 on the subject noted above.

2. In this regard, it is intimated that there is no mining contract within a radius of 500 meters of Sultanpur Unit,but there is no conrtact/leasae is working at present. This is for your information and further necessary action.

Mining Officer
Deptt of Mines & Geology
Faridabad/Palwal

ANNEXURES – 1.3

APPROVED MINING PLAN

2610816/2023/Estt.Br

From

The Director,
Mines and Geology Haryana,
Plot No. 9, I.T. Park, Sector-22,
Panchkula.

To

M/S M M Traders,
Through Sh.Manjeetkumar,S/O Sh.Ved parkash,
Village Manglora Quidem, Karnal.

Memo No. DMG/HY/MP/Sultanpurunit/2022/6375-6378
Dated Panchkula, the 18-10-2022.

Subject: **Submission of Mining Plan including Progressive Mine Closure Plan of Sultanpur sand Unit Minor Mineral Mine in District Palwal,Haryana, comprising an area of 33.42 hectares (25.06 Area for Mining activity + 8.36 Area for Ancillary Activity) - M/s M M Traders ,Karnal.**

****

Reference to your letter dated 29.09.2022 on the subject noted above.

2. Vide letter under reference, the Mining Plan along with Progressive Mine Closure Plan in respect of an area of 33.42 hectares of land in villages Sultanpur &Atwa, district Palwal was submitted for approval.

3. In exercise of the powers conferred by Rule 69 of the Haryana Minor Mineral Concession, Stoking, Transportation of Minerals and Prevention of Illegal Mining Rules, 2012, I hereby approve the above said Mining Plan along with Progressive Mine Closure Plan in respect of Sand mine of Villages – Sultapur & Atwa, over an area of 33.42 hectares of land situated in village – Sultapur & Atwa of district Palwal. This approval is subject to the following conditions:-

(i) That this Mining Plan and Progressive Mine Closure Plan is approved without prejudice to any other laws applicable to the mine/area from time to time whether made by the Central Government or State Government or any other authority.

(ii) That this approval of the "Mining Plan along with Progressive Mine Closure Plan" of Mining does not in any way imply the approval of the State Government in terms of any other provisions of the Mines and Minerals (Development & Regulation) Act, 1957 or Haryana Minor Mineral Concession, Stocking, Transportation of Minerals and Prevention of Illegal Mining Rules, 2012 or any other law including Forest (Conservation) Act, 1980 and Environment Protection Act, 1986 and rules framed there under.

(iii) That this "Mining Plan along with Progressive Mine Closure Plan" is being approved on the basis of data provided by you. In case, at any point of time any ambiguity in the same is found, the approval will be revoked with suspension of the mining operations and will be allowed to resume operation only after modification/rectification of the same, if so required.

2610816/2023/Estt.Br

(iv) That this "Mining Plan along with Progressive Mine Closure Plan" is approved without prejudice to any other order or direction from any court of any competent jurisdiction and is for a period of five years only and shall not be make you entitled for any extension of the lease period.

(v) That all the norms and provisions as envisaged in the Mining Plan would be adhered to, during the working of mine.

(vi) That the Financial Assurance of Rs. 5,01,300/- (Rs. Five lac one thousand Three hundred only) as required under the provisions of Rule 71(6) of "Haryana Minor Mineral Concession, Stocking, Transportation of Minerals & Prevention of Illegal Mining Rules, 2012, shall be furnished within a period of 60 days or before start of mining operations, whichever is earlier.

4. Further, as per condition no. 4.20 of the LoI dated 17.08.2022, the actual mining will be allowed to be commenced only after Prior Environmental Clearance from the Competent Authority as required under EIA notification dated 14/9/2006, as amended from time to time by the MoE&F, GoI and guidelines/ circulars issued in this behalf.

Encl: Mining Plan & Progressive Mine Closure Plan (2 copies)

State Geologist,
for Director, Mines and Geology,
Haryana

Registered Post
Endst. No. DMG/HY/MP/Sultanpurunit/2022/ Dated:

A copy along with a copy of the dully approved Mining Plan and Progressive Mine Closure Plan is forwarded to the Director Mines Safety, Room No. 201-203, 2nd Floor, B-Block, CGO Complex-II, Hapur Road, Ghaziabad for information and necessary action.

Encl: Mining Plan & Progressive Mine Closure Plan

- Sd -
State Geologist,
for Director, Mines and Geology,
Haryana

Endst. No. DMG/HY/MP/ Sultanpurunit/2022/ Dated:

A copy along with a copy of the dully approved Mining Plan and Progressive Mine Closure Plan is forwarded to the Mining Officer, Mines and Geology Department, Faridabad for information and necessary action.

Encl: Mining Plan & Progressive Mine Closure Plan

- Sd -
State Geologist,
for Director, Mines and Geology,
Haryana

Endst. No DMG/HY/MP/ Sultanpurunit/2022/ Dated:

A copy is forwarded to Shri D.C. Yadav, House No. 282, Sector 11-D, Faridabad - 121 001 (Haryana) w.r.t. his letter dated 29.09.2022 for information and necessary action.

- Sd -
State Geologist,
for Director General, Mines and Geology,
Haryana

2610816/2023/Estt.Br

MINING PLAN AND PROGRESSIVE MINE CLOSURE PLAN

Prepared under Rule 70 of Haryana Minor Mineral Concession, Stocking, Transportation of Minerals & Prevention of Illegal Mining Rules, 2012

FOR

RIVER SAND

Sultanpur Unit

Total Contract /Grant area=33.42 Hectares)

DISTRICT - PALWAL, STATE- HARYANA

APPLICANT-

M/s M.M.Traders,through Manjeet Kumar S/o Sh.Ved Parkash,Village Manglora Quidem,Karnal,Haryana

PREPARED BY

D.C.Yadav

RQP/DMG/HRY/2018/03.

House No. 282, sector 11-D, Faridabad (Haryana)

SUBMITTED TO- THE DIRECTOR GENERAL, MINES & GEOLOGY HARYANA (AUGUST 2022)

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MINING PLAN & PROGRESSIVE MINE CLOSURE PLAN FOR SAND IN SULTANPUR BLOCK
PALWAL ,AREA-33.42 ha. District Palwal (Haryana) Open cast mechanized

CONTENTS

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Deepak Kumar

Deepak Kumar
State Geologist

2610816/2023/Estt.Br

List of annexure

Sr.no.	Description
1	A copy of LOI
2	Consent letter from applicant to prepare the mining plan
3	RQP Certificate

LIST OF PLATES

Plate. No.	Description
1	Location Plan
2	Key plan
3	Surface Geological plan and section
4	Plan showing the position of Mine Workings at the end of Each Year.
5	Reclamation Map
6	Environmental Plan

2610816/2023/Estt.Br

MINING PLAN & PROGRESSIVE MINE CLOSURE PLAN FOR SAND IN SULTANPUR BLOCK - PALWAL ,AREA-33.42 ha. District Palwal (Haryana) Open cast mechanized

INTRODUCTION

M/s M.M.Traders, through Manjeet Kumar S/o Sh.Ved Parkash,Village Manglora Quidem,Karnal,Haryana was the highest bidder (4.56 Crores) for the Sand quarries of Sultanpur Unit for which auction held on 26-06-2022.

Letter of Intent has been issued by the Director Mines & Geology Haryana vide letter dated 17-08-2022 for Mining of Sand (Minor Mineral) in Sultanpur Unit , comprising Sultanpur & Atwa villages over an area of 33.42 hectares in district Palwal, Haryana for a period of 8 years (Annexure – I).

The applicant is involved in the Mining business for last many years. The applicant can invest necessary funds for the scientific and systematic development of mines including land rejuvenation and progressive reclamation programme and other measures necessary to protect the quality of the environment and human health etc.

The objective of preparation of this mining plan and progressive mine closure plan is to fulfill the conditions stipulated by the Department of Mines & Geology, Haryana required under Haryana Minor Mineral Concession Rules, 2012. The conditions which are related to the contract/mining plan are reproduced here below.

- The period of contract shall be 8 years and shall commence w.e.f. the date of grant of environmental clearance by competent authority and Consent to operate by State Pollution Control Board, whichever is later, or on expiry of the period of 12 months from the date of issuance of "Letter of Intent",(LOI) whichever is earlier;
- The contractor shall also deposit/pay an additional amount equal to 7.5 % of the due contract money along with installments towards the 'Mines and Minerals Development, Restoration and Rehabilitation Fund';
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- The contractor shall also deposit/pay an additional amount equal to 2.5% of the due contract money along with installments towards the 'District Mineral Fund'.
- The mining contractor shall got prepare a "Mining Plan" along with the Mine Closure Plan (Progressive & Final) from the Recognized Qualified Person as per chapter 10 of the "Haryana Minor Mineral Concession, Stocking, Transportation of Minerals and Prevention of Illegal Mining Rules, 2012" for mining area granted on contract. The contractor shall not commence mining operations in any area except in accordance with such Mining Plan duly approved by an officer authorized by the Director, Mines & Geology, in this behalf.
- Further, the actual mining will be allowed to be commenced only after prior Environmental Clearance is obtained by the LOI holder/mining contractor for the Mining blocks area from Competent Authority as required under notification dated 14/9/2006 issued by the MOEF, GOI or as amended from time to time.
- The Mining contractor would also be liable to pay following to the land owners;
  a) The annual rent in respect of the land area blocked under the concession but not being operated, and;
  (b) The rent plus compensation in respect of the area used for actual mining operations.
- The total mineral excavated and stacked by the concession holder within the area granted on mining contract shall not exceed two times of the average monthly production as per approved Mining Plan at any point of time. Provided that in case of riverbed contract the, total mineral excavated and stacked by the concession holder within the area granted on mineral concession at any point of time shall not exceed three times of the average monthly production as per approved mining plan;
- The amount of annual rent and the compensation shall be settled mutually between the landowner and the mining contractor. In case of non-settlement of the rent and compensation, the same shall be decided by the District Collector concerned in accordance with the provisions of Chapter 9 of " the State Rules, 2012";

- The Mining contractor shall not stock any mineral outside the concession area granted on mining contract, without obtaining a valid mineral dealer license as per provisions contained in Chapter 14 of the "Haryana Minor Mineral Concession, Stocking, Transportation of Minerals and Prevention of Illegal Mining Rules, 2012".

- The contractor shall not carry out any mining operations in any reserved/protected forest or any area prohibited by any law in force in India, or prohibited by any authority without obtaining prior permission in writing from such authority or officer authorized in this behalf. In case of refusal of permission by such authority or officer authorized in this behalf, contractor(s) shall not be entitled to claim any relief in payment of contract money on this account.

- Following special conditions shall be applicable for excavation of minor mineral(s) from river beds in order to ensure safety of river-beds, structures and the adjoining areas:

  (i) No mining would be permissible in a river-bed up to a distance of five times of the span of a bridge on up-stream side and ten times the span of such bridge on down-stream side, subject to a minimum of 250 meters on the up-stream side and 500 meters on the down-stream side;

  (ii) There shall be maintained an un-mined block of 50 meters width after every block of 1000 meters over which mining is undertaken or at such distance as may be directed by the Director or any officer authorized by him;

  (iii) The maximum depth of mining in the river-bed shall not exceed three meter from the un-mined bed level at any point in time with proper bench formation;

  (iv) Mining shall be restricted within the central 3/4th width of the river/ rivulet;

  (v) In case of areas areas adjoining to rivers/rivulets, no mining shall be permissible in an area up to a width of 500 meters from the active edges of embankments in case

of river Yamuna, 250 metres in case of Tangri, Yamuna and Ghaggar and 100 meters on either side of all other rivers/ rivulets;

(vi) Any other condition(s), as may be required by the Irrigation Department of the state from time to time for river-bed mining in consultation with the Mines & Geology Department, may be made applicable to the mining operations in river-beds.

- ***No mining operation may be carried out from 01-07 to 15-09 every year (rainy season)***

- That no mining operation shall be allowed in the urbanize zone of area notified by Town and Country Planning Department. Further, in case of the agriculture zone notified by Town and Country Planning Department mining shall be permissible only after obtaining prior permission from the competent authority.
- A safety margin of two meters (2m) shall be maintained above the ground water table while undertaking mining and no mining operations shall be permissible below this level unless a specific permission is obtained from the competent authority in this behalf. Further the depth of excavation of mineral shall not exceed nine meters (9m) at any point of time.
- The contractor shall not undertake any mining operations in the area granted on mining contract without obtaining requisite permission from the competent authority as required for undertaking mining operations under relevant laws.
- The contractor shall be under obligation to carryout mining in accordance with all other provisions applicable as per Mines Act, 1952, Mines and Minerals (Development and Regulation) Act, 1957, Indian Explosive Act, 1884, Forest (Conservation) Act, 1980 and Environment (Protection) Act, 1986 and the rules made there under Wild Life (Protection)

Deepak Kumar

Act, 1972, Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981.

1.0. GENERAL:

a) **Name and address of the Lessee/applicant:**

M/s M.M.Traders,through Manjeet Kumar S/o Sh.Ved Parkash,Village Manglora Quidem,Karnal,Haryana.

Phone no.

E mail ID-

b) **Status of the Applicant**;-The applicant is a Pvt. Ltd Co.

c) **Name, Address and registration number of the RQP preparing the mining plan**

The applicant has assigned the work of preparation of mining plan to Sh D.C.Yadav

(Consent letter enclosed as annexure -2 and copy of RQP certificate as annexure-3)

Regd. No RQP/DMG/HRY/2018/03

House No. 282 Sector 11-D Faridabad (Haryana)

Mobile no. 941621607;09560848579

Email- dcyadav747@gmail.com

2.0 Details of the Mining lease

a) Details of the land covered in the 'Area' notified by Hr. Govt. on 25-05-2022 is as under:-

Mining Lease of Sand (Minor Mineral) over an area of 33.42ha is located in District Palwal namely Sultanpur Block covering Sultanpur and Atwa villages for extraction of the sand (river bed);

2610816/2023/Estt.Br

MINING PLAN & PROGRESSIVE MINE CLOSURE PLAN FOR SAND IN SULTANPUR BLOCK
PALWAL ,AREA-33.42 ha. District Palwal (Haryana) Open cast mechanized

Block.	Village Name	Khasra Nos.	Area for mining activity (in acre)	Area for mining activity (in acre)	Area for ancillary activities (in acre)	Total Area of mining unit in acre as per Revenue record (in acre)	Total area as per GPS (in acre)	Total mining area (in hect) = [Acre ÷ 2.5]
Sultanpur	Sultanpur	**For Mining** **122/9//** 9 min, **122/3//** 3 min, 4, 5, 6, 7, 8 min, 14 min, 15, 16 min, **122/4//** 10, 11, 12, 13, 16, 17, 18, 19, 20 min, 21, 22 min, 23 min, 24, 25, **122/5//** 2, 3 min, 4, 5, 6, 7 min, 8, 14 min, 15 min, 122 min. **For Ancillary area** **122/3//** 11, 12, 19, 20, 21, 22, **122/6//** 1, 2 **122//2** 15, 16/1, 16/2, 25	39.25	62.66	11.00	83.54	91.27	25.06
	Atwa	**For Mining** **9//** 10 min, 11 min, 12 min, 13 min, 16 min, 17 min, 18, 19, 20, 21 min, 22 min, 23, 24, 25 **8//** 21 min, 22 min, 24 min, 25 min **15//**, 2 min, 3 min, 4 min, 5, 6	23.41		9.88			

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6

		min, 16//, 1, 2 min, 9 min, 10 10//, 4 min, 6 min, 7 min, 14 min, 15, 16 min, 17 min, 25/2 min, For Ancillary area 14// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10						

GPS Coordinates of the proposed area provided by Mines Geology Department Haryana as published in auction Notice are as under:

Block Name	Name of Village	Pillar	Latitude	Longitude
Sultanpur	Sultanpur	G	28° 3'56.669"N	77° 29' 6.045"E
		H	28° 3'52.146"N	77° 29' 15.535"E
		I	28° 3'48.249"N	77° 29' 10.354"E
		J	28° 3'51.958"N	77° 29' 3.583"E
		Q	28° 3'44.13"N	77° 29' 31.61"E
		R	28° 3'36.68"N	77° 29' 27.15"E
		S	28° 3'50.19"N	77° 29' 13.46"E
	Atwa	Q	28° 1' 58.417"N	77° 30' 17.832"E
		Q1	28° 1' 54.900"N	77° 30' 16.700"E
		R	28° 1' 56.464"N	77° 30' 24.256"E
		R1	28° 1' 52.500"N	77° 30' 23.700"E
		S	28° 1' 54.767"N	77° 30' 30.784"E
		S1	28° 1' 51.200"N	77° 30' 28.900"E
		T	28° 1' 52.969"N	77° 30' 38.540"E
		T1	28° 1' 49.000"N	77° 30' 36.200"E

		U	28° 1' 52.095"N	77° 30' 41.268"E
		U1	28° 1' 48.300"N	77° 30' 41.600"E

b) **Name of Mineral**

River Sand (minor mineral)

c) **Description report of the mining lease/ quarry license with plan (copy of sanction order/ lease deed/ license)**

Based on the details published vide Haryana Government Gazette notification dated 25-05-2022 issued by DMG, Haryana and the Khasra map submitted by the applicant, survey of the area was carried out along the course of the river Yamuna in the revenue villages of Sultanpur and Atwa as detailed above which flow from North to South side. Workings will be restricted within the lease area/ khasra's allotted. Mining activities will be carried out in a manner so that there is no obstruction to the movement of water flow, if any, during rainy season. The total length of the lease area is about 1.50kms kms.

d) **Key plan of the area**

Key plan: key plan on 1: 50,000 scale covering an area in a radius of 5 km showing salient features as per Rule 28(5) (a) of MCDR, 1988 has been prepared on Toposheet (Plate no. 2) The area is marked on the enclosed key map. The deposit lies between Latitudes detailed as under . (Plate no. 2)

Mining area is shown on the Key Plan. Toposheet is enclosed as **Plate – 02.**

e) **Location map of the mining lease showing the details of the approach roads up to the mine**

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Lease area is shown on the Key Plan **Plate – 2**. It forms a part of G. T. Sheet No's 53E/5,9 and 53 H/8,12 .The area is approachable from nearest town of Palwal, Hodal and Hassanpur. These are located about from 20-25 Kms south east of Palwal City. All these quarries are connected by metalled road branching off from GT road NH-2 and road connecting Hassanpur-Palwal via Sultanpur and then kutcha roads up to the river quarries as shown in the plate no, 2

State Headquarters: Chandigarh is about 350 km in the North of the lease area and National Capital Delhi is about 97 km from the north edge of the proposed area.

f) Infrastructure facilities:

Nearest railway station	**Palwal , Hodal** Railway station
Police station	**Hassanpur**
Post office	**All the nearby villages**
Medical facilities	**Palwal, Balabgarh , Faridabad & New Delhi**
Electricity	Electrical supply is available in all nearby villages.
Education facilities	Most of the nearby villages have secondary schools and for higher education institutes are available at Palwal,Hodal,Hassanpur,Ballabgarh and Faridabad.
Mode of transportation of mineral	Mineral Sand will be transported by hired trucks. Loaded trucks will travel on Kuccha road made for plying of trucks. Temporary roads will provide access to the river bed and the movement of loaded trucks. As the lease area

	stretches in a length of around 1.50km, working will be carried out in both villages river bed. Each village has its outlet meeting the tar road on the nearby villages and from where the mineral is sent to various destinations. Similarly, mineral will be transported on the other side through approach roads which finally merge with tar roads for final destinations.

3) **DETAILS OF EXISTING MINING PITS, THEIR DIMENSION AND LOCATIONS**

Presently there is no pit available in the river bed.The past 2-3 years floods/ monsoon waters have peneplained the earlier worked river bed. Earlier Sand from this area used to transport from the road network ultimately to various destinations in the NCR. Surface & geological plan & sections enclosed as **Plate – 3.**

Present Land use Pattern :- (in hectares)

S. No.	Particulars	Present land use (ha.)
1.	Pit area	0.00
2.	Dump area	0.00
3.	Area for ancillary activities, office , rest shelter etc	8.35
4	Mineral Storage	0.00
5.	Plantation	0.00
6.	Area for mining	25.06

Total	33.42

3.1 Physiography, Hydrogeology, Drainage and Climate

Palwal district of Haryana lies between 27° 50' : 28° 15'40" north latitudes and 77° 05' : 77°33' east longitudes. Total geographical area of the district is 1364.55 sq.km. Administratively, Palwal is the district Headquarter of the district. It is divided into 4 development blocks namely Palwal, Hathin, Hodal and Hassanpur . The district area is bounded on western side Mewet district, Eastern side by U.P. state and northern side by Faridabad district and falls in survey of India toposheets no. 53H/3, H/4, H/7, H/8, H/9, H/12, and 54E/5 and E/9.There vare two main canals Agra canal and Gurgaon canal which passes through western and central part of the district respectively from north to south.In the northeren part of the district Budia nala is flowing from east to west and discharges its rainy water in river Yamuna. The Gaunchi main drain passes through north south direction of the district running in between Agra canal and Gurgaon canal.CGWB has carriedout roundwater exploration besides other hydro geological and geophysical studies in the district.

The river bed area is marked by south to south east slope. Nearby area is almost flat topography of sedimentary formations, which are surrounded by fine-grained soil. Sand is transported and deposited in river bed during Monsoon. Sometimes floods crosses the river banks and deposit the sand in the flood plains as well.

The levels of the river bed and bank area of the proposed mining area are as under.

Location	River bed levels (mRL)	River bank top levels(mRL)	River area village
E-400	181.30	184.00	Sultanpur
E-500	181.25	184.00	
E-600	181.20	183.70	
E-700	181.07	183.50	
E-800	180.50	183.00	
E-900	180.25	182.50	
E-1000	179.60	182.00	
E-1100	179.50	181.50	
E-1200	179.00	181.00	
E-300	177.40	180.53	
E-400	177.33	180.30	
E-500	177.10	180.15	

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Deepak Kumar
State Geologist

E-600	177.00	180.10	Atwa
E-700	176.92	180.00	
E-800	176.60	179.80	
E-900	176.35	179.50	
E-1000	176.00	179.00	
E-1050	176.00	179.00	

Highest elevation in river bed at extreme north end is 181.30mRL and bank top level is 184.0 mRL where as the levels at the extreme south end in river bed is 176.00mRL and River bank top is 179.00 mRL

The Yamuna river flows from NW to SE direction in Sultan pur revenue village where as its direction of flow in Atwa area river bed is almost west to east..

Hydrogeology

The district is occupied by Indo-Gangetic alluvial plain of Quaternary age, and falls in Yamuna sub -basin of Ganga basin. The Central Ground Water Board has drilled 21 exploratory boreholes to delineate and determine potential aquifer zones, evaluation of aquifer characteristics.Out of 21 exploratory boreholes 13 boreholes were abandoned due to poor quality of ground water. The permeable granular zones comprising fine to medium grained sand and occasionally coarse sand and gravel. Their lateral and as well as vertical extent is limited. The borehole data reveals that clay group of formations dominate over the sand group in the district area. Ground water occurs in alluvium and the underlying weathered/fractured quartzites .Alluvium comprises sands silt, Kankar and gravel. Which form the principal ground water bearing horizon In Quartzite formation, occupying the north-western part of the district, ground water occurs in weathered and jointed fractured horizons. Weathering and fracturing has resulted in formation of semi-consolidated sand beds (BADARPUR SANDS) which form potential aquifer zones. This quartzite formation has not been explored for ground water occurrence. In alluvium, granular zones are evenly distributed in entire thickness which is negligible near the quartzite outcrops to over 350 m in the eastern parts near Yamuna River. The discharge of the wells ranges from 750 lpm to 900 lpm at a drawdown of5.5 to 7.00m. The transmissivity 'T' value ranges between 55 to 200 m^2 / day was determined. Shallow tube wells for irrigation use are generally constructed up to a depth of 40 m. The discharge of these shallow tube wells range 360 -600 liters per minutes.

RAINFALL AND CLIMATE:

The climate of Palwal district can be classified as tropical steppe, semiarid and hot which is mainly characterized by the extreme dryness of the Air except during monsoon months. During three months of south west monsoon from last week of June to September, the moist air of oceanic penetrate into the district and causes high humidity, cloudiness and monsoon rainfall. The period from October to December constitutes post monsoon season. The cold weather season prevails from January to the beginning of March and followed by the hot weather or summer season which prevails up to the last week of June. The normal annual rainfall in Palwal district is about 542 mm spread over 27 days. The south west monsoon sets in the last week of June and withdraws towards the end of September and contributes about 85% of the annual rainfall. July and August are the wet test months 15% of the annual rainfall occurs during the non-monsoon months in the wake of thunder storms and western disturbances.

Normal Annual Rainfall: 542 mm

Normal Monsoon Rainfall: 460 mm

Temperature

Mean Maximum: 41^0 C (May & June)

Mean Minimum: 8^0 C (January)

Normal Rainydays : 27

(Source: District Groundwater Brochure CGWB).

3.2 Geology of the Area

3.2.1 Regional Geology

The regional geology of Distt. Faridabd & Palwal (Haryana) is represented by varieties of formations belonging to Delhi Super Group. Stratigraphically the rock formations of Delhi super group are composed of arenaceous, argillaceous & calcareous sediments. These sediments have been placed by Heron (1923) in the Alwar & Ajabgarh series of Delhi system & intruded by basic granitic rocks.

The general succession of Delhi system can be represented as follows: (Das, Gupta S.P. 1968)

Series		Rock Types
Recent intrusive		Alluvium, dune sand, soil, ankerite, chert, guartz veins, younger basic dykes. Granites, Pegmatites, Quartz veins Older basic rocks.
Ajabgarh series	8.	Carbonaceous phyllites & schists etc. (Local).
	7.	Massive Quartzites.
	6.	Phyllites, Mica-shists (Local).
	5.	Marble, calc-gneiss, amphibolite etc.
	4.	Schist with or without garnet.
		Stauroite, Kyanite, Sillimenite, Andalusite, phyllites, sandy phyllites.
Alwar series	3.	Amphibole quartzite, marble, Amphibolites.
	2.	Arkosic quartzites, quartzites & Interealated phyllite & schists. Magnetite & Hametite quartzites etc.
	1.	Phyllite & schists.

3.2.2 LOCAL GEOLOGY

Yamuna River meanders through the area & deposits the sands during monsoon floods in the area. That sand found in Distt. Palwal are Alluvial sediments of fluvial deposits brought down from Himalayas from the upstream side by river Yamuna and its tributaries which have variable thickness depending upon the original land form on which deposition took place. The river sand is most recent deposit of clean sand deposited by river Yamuna and is being reworked every year.

The litho units encountered in the river bed are younger sedimentary formations in nature and are brought by river water from high reaches of Himalayan range of hills of Himachal Pradesh. The sediments are river borne and have been deposited in the riverbed and its flood plains

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i) **Geology of the area**

The sediments of the river bed are of recent nature. These sediments have been brought by river water and deposited in the bed of Yamuna River. The following sequence of formations has been observed in the area:

- Soil/Alluvium
- Sand

ii) **Description of formations**

Description of formations found in the area are as under:

Soil/ alluvium: The finer sediments have been deposited in the flood plains of the River Yamuna.

Sand

Sediments of less than 1-3 mm size are predominantly deposited in the riverbed by flood waters during rainy season. There is no perfect classification between Sand and Silt. They have been deposited in a mixed state. As usual the larger size sediments are deposited at the bottom and the smaller sizes are deposited at the top, on the edges/flanks of the riverbed.

However, during the course of shifting of the river course towards East about five hundred years back, silt was deposited on top in thicker layers up to 3 meters in some cases underlain by about 6-15 meters of sand.

Sediments of various sizes and in mixed form are predominantly deposited in the river bed and there is no perfect classification between sediments. These may be called as coarse sand, medium sand and fine sand.

The term sand is used to denote an aggregate of mineral or rock grains greater than 1/16mm and less than 2 mm in diameter.

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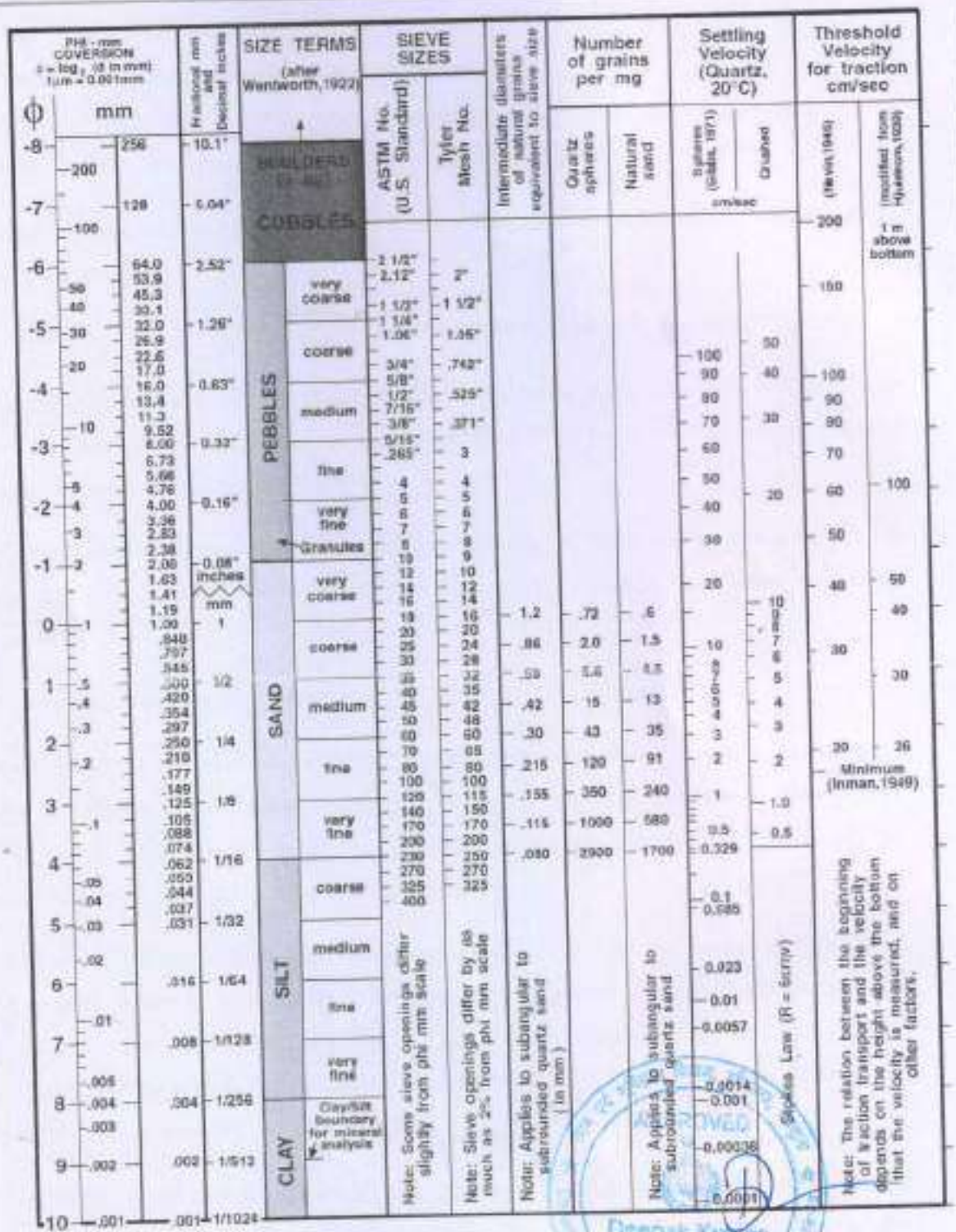
2610816/2023/Estt.Br

MINING PLAN & PROGRESSIVE MINE CLOSURE PLAN FOR SAND IN SULTANPUR BLOCK
PALWAL ,AREA-33.42 ha. District Palwal (Haryana) Open cast mechanized



3.2 PHYSICAL & CHEMICAL CHARACTERISTICS OF MINERAL

Technically, sand is merely a size category. Sand is particulate matter that's larger than silt and smaller than gravel. Different specialists set different limits for sand:

Engineers call sand anything between 0.074 and 2 millimeter, or between a U.S. standard #200 sieve and a #10 sieve.

Soil scientists classify grains between 0.05 and 2 mm as sand, or between sieves #270 and #10.

Sedimentologists put sand between 0.062 mm (1/16 mm) and 2 mm on the Wentworth scale, or 4 to −1 unit on the phi scale, or between sieves #230 and #10. In some other nations a metric definition is used instead, between 0.1 and 1 mm.

From a geological viewpoint, sand is anything small enough to be carried by the wind but big enough that it doesn't stay in the air, roughly 0.06 to 1.5 millimeters. It indicates a vigorous environment.

Sand Composition and Shape

Most sand is made of quartz or its microcrystalline cousin chalcedony, because that common mineral is resistant to weathering. The farther from its source rock sand is, the closer it is to impure quartz. But Yamuna sands contain quartz grains, tiny bits of rock (lithics), or dark minerals like limestone and ferruginous concretions.

The size of the sediments is variable. The grains whether small or large are rounded in shape. Sand is grey, brown in color,coarse to fine grained. The present deposits are of good quality and can be used for building industries. There is no other use of this material.

3.2.4 ORIGIN & CONTROL OF MINERALISATION(ANNUAL REPLENISHMENT OF MINERAL IN RIVER BED AREA vis-à-vis 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 it also includes

deposits from glacial ice and those materials 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 sediment logy.

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":

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

- Structural Plain
- Structural Hill
- Structural Ridge
- Denudation Ridge & Valley
- Plain & Plateau of Gangetic plain
- Highly Dissected pediment
- Un dissected pediment

b) Distribution of Basin Area River wise (Area in Sq. Km or Sq. Miles)

c) Drainage System/Pattern of the area (Drainage Density = ...Km/Sq. Km of Yamuna River

d) Rainfall &Climate : Year wise Rainfall data for previous 8 years of Yamuna Basin/River

e) As per Dandy & Bolton study "Sediment Yield" can be related to

f) Catchment Area and

g) 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.

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The Rivers originating from the Himalayas bring with them lots of aggregate materials whereas as they move downstream, only finer elements / minerals like sand are found in abundance. River Yamuna near Dakpathar barrage leaves Uttarakhand and enters Himachal Pradesh.

The YAMUNA RIVER is the biggest tributary of the river Ganga in North India. Its source in the Yamunotry glacier at an elevation of 6387 mtrs on South western sides of Banderpooch crests in the lower Himalayan ranges. The overall span of the Yamuna river is 1376 Kms (855 miles) with catchment area of 366223 square km (141,399 square mile). This encompasses 40.2 % of the whole Ganga valley, prior to joining Ganga at TriveniSangam in Allahabad (UP)

Itinerary of Yamuna River and its tributaries

The river passes through many states such as Uttrakhand, UP, Haryana, going across to HP and then Delhi. With yearly discharge of around 10,000 cubic billion meters (cbm) and consumption of 4400 cbm (of which irrigation comprises 96%), the river represents above 70% of water provision of Delhi. Yamuna water are fairly good quality for its entire span from Yamunotri in Himalayan ranges to Wazirabad in Delhi, the length of which is around 375 Kms.

Itinerary of Drainage area of Yamuna:

The origin of Yamuna is situated in the Yamunotri glacier at an elevation of 6387 mtrs on SE sides of Banderpooch crests, which are located in the Mussoorie range of lower Himalayan range in Uttrakashi district of Uttrakhand, to the North of Haridwar. From this place Yamuna runs to South around 200 Kms across the Shivalik mountain ranges and lower Himalayan ranges. A significant portion of its beginning of Drainage basin (with total area of 217.00 square km) is situated in HP and a major tributary sapping the upper drainage basin in the Tons, which is also biggest and most extensive tributary of the Yamuna. Other tributaries in the area are the Rishi Ganga, Giri, Hanuman Ganga, Kunta& Bata, which sap the upper drainage basin of the huge Yamuna river. Subsequently, the river moves down the terrains of Doon basin at DakPathar close to Dehradun, in this place water is redirected into a channel for the purpose of electricity generation. Once it goes across the sikh religious place of Ponta Sahib, the river arrives at Tajewala in the YAMUNANAGAR district of Haryana where a dam was constructed in 1873. This dam is the origin of the two major channels or water courses – Eastern Yamuna Canal and Western Yamuna Canal

and both drain in UP & Haryana. The Western Yamuna Canal (WYC) traverses Karnal, Yamunanagar and Panipat prior to arriving at the Haiderpur water treatment plant, which provides a portion of municipal water provisions of Delhi. The Yamuna also forms natural boundary between the states of Uttrakhand& HP and also amid the states of UP and Haryana. Together with the Ganga to which it flows almost parallel once it meets the Indo-Gangetic plateau, the biggest Alluvial productive area in the World, it forms the Ganges-Yamuna Doab are stretched across 69,000 square Km which is 33% of the whole area.

Table of Drainage Basin area of River Yamuna (square KM/square mile) with % of Drainage Basin

1.	HP	5799/2240 (1.6 %)
2.	UP &Uttrakhand	74208/142 (21.50 %)
3.	Rajasthan	102883/39739 (29.80%)
4.	Haryana	21265/8214(6.5%)
5.	Delhi	1485/574(0.4%)
6.	MP	14023/5416 (40.6%)

Dandy & Bolton formula for calculation of Sediment Yield:

Dandy & Bolton formula is often used to check whether the sedimentation yield exceeds the replenishment rate but the whole question is whether there is adequate monitoring of the river basin, the answer is no as hydrological stations are sparsely spread. The formula uses catchment area and mean annual runoff as key determinants to give a yield value. It does not differentiate in basin wide smaller streams and their characteristics. CWC distinguishes river basins as classified and non-classified, as per the latest hydrological data for unclassified River basins, there are 122 GDSW (Gauge, Discharge, Sediment & Water Quality) sites in 12 such basins, the number was 147 in 2005. This brings in context the whole issue of scientific mining, thereby indicating that the monitoring of sediment yield in rivers / streams within the river basins is essential to arrive at

extraction rates and express and conduct environmental studies based on these basin wide characteristics which should become part of the 'Terms of Reference'.

Sediment Yield versus Drainage Area

Dandy and Bolton studied sedimentation data from about 1500 reservoirs, ponds, and sediment detention basins. In developing their formulas, they used data from about 800 of these reservoirs with drainage areas greater than or equal to 1 mi2. The smaller watersheds-those of drainage area less than 1 mi2-were excluded because of their large variability of sediments yield, reflecting the diverse effects of soils, local terrain, vegetation, land use, and agricultural practices.

For drainage areas between 1 and 30,000 mi2,Dandy and Bolton found that the annual sediment yield per unit area was inversely related to the 0.16 power of the drainage area:

In which S= sediment yield in tons per square mile per year; SR = Reference sediment yield Corresponding to a 1-mi2 drainage area, equal to 1645 tons per year; A = drainage area in square miles; and AR = reference drainage area (1 mi2)

Sediments Yield versus Mean Annual Runoff

Dandy and Bolton studied sedimentation data from 505 reservoirs having mean annual runoff data. Annual sediment yield per unit area was shown to increase sharply as mean annual runoff Q in- creased from 0 to 2 in. Thereafter, for mean annual runoff from 2 to 50 in. annual sediment yield per unit area decreased exponentially.

This led to the following equations.

For Q <2 in.:

For Q >2 in.:

In which QR = reference mean annual runoff QR = 2 in.

Dandy and Bolton combined Equation 15-10 and 15-11 into a set of equations to express sediment

yield in terms of drainage area and mean annual runoff.

For Q <2 in.:

For Q >2 in.:

Sec: 15.2 Sediment Productions.

For SR = 1645 tons/mi2/y, QR = 2 in., and AR = 1 mi2, Eq. 15-12 reduces to the followings:

For Q <2 in.: S = 1280 Q0.46 (1.43 – 0.26 log A)

For Q >2 in.: S = 1965e-0.055Q (1.43 – 0.26 log A)

Equations 5-12 and 5-13 are based on average values of grouped data; therefore, they should be used with caution. In Certain cases, local factors such as soils, geology, topography, land use, and vegetation may have greater influence on sediment yield than either mean annual runoff or drainage area. Nevertheless, these equations provide a first approximation to be of sediment yield for watershed planning purposes.

Calculation of Sediment Yield for Sand Mine of Sultanpur Block

Total Targeted Production is 10.80 Lakh MT/year

- Area under riverbed: 25.06 Hect.
- Drainage basin area of river Yamuna and is tributaries in Haryana : 8214 square miles
- Normal Annual Rainfall of Yamuna catchment are district (1978 to 2005) :1076mm or 42.36 inch

With above inputs, the calculation of the sediment yield by the Dandy and Bolton formula is illustrated below:

	S.No.	Q (in inches)	A (in square mile)	S
Sample Set	1	3.5	150	1400.823
	2	27.4	8214	179.4756

$$S = 1965\, e^{-0.055Q}[1.43 - 0.26 \log(A)]$$

Dandy & Boltan formula also says that actual sediments yield from individual drainage basins may vary 10-fold or even 100 fold from computed yields. Since itinerary of river Yamuna indicates that its basis comprises of sediment rocks with good average rainfall therefore there are fair chances of yield of sediments to be 50 fold of computed results hence Actual Sediment Yield will be about 20-25 Lakh Tones / Annum

The equations express the general relationships between sediment yield runoff and drainage area.They may provide a quick rough approximation of mean sediment yields on a regional basis for preliminary watershed planning. Because Dandy & Bolton have derived the equation form

average values computed sediment yields normally would be low for highly erosive area and high for well stabilized drainage basins with high plant density. Factors which have direct bearing on sediments yield & limitations of Dandy & Bolton equation.

Sediment yield of a sediment basin has direct impact of local terrain, climate, vegetation, soils, agricultural practices & land use pattern of catchment area of the sediment basin aforesaid factors varies from basin to basin therefore, Dandy & Bolton has category stated that use of the equation to predict sediment yield for a specific location would be unwise because of the wide variability caused by local factors not considered in the equation development. Actual sediment yield form individual drainage basins may vary 10-fold or even 100-fold from computed yields.

3.2.5 Grade & Use of Sand

The minor mineral sand is made of quartz or quartzite/its microcrystalline cousin chalcedony, because that common mineral is resistant to weathering. Sands contain quartz, feldspar grains, tiny bits of rock (lithics), or dark minerals like ilmenite and magnetite.

The size of the sediments is variable. The grains whether small or large are rounded in shape. Sand is mainly grey, brown in color, coarse to fine grained. The present deposits are of good quality and can be used for building industries. There is no other use of this material.

3.2.6 Exploration

No specific method of exploration is required as the river borne sediments are deposited all along the riverbed and are very well exposed on the surface. Moreover, these sediments are accumulated/ replenished every year during rainy season by flood waters to almost the same level depending on the intensity of rains on the upstream side. Adequate quantity of sand reserves is available for meeting consumer demand.

(Surface-cum-geological plan & sections plate-3).

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3.3 RESERVE

3.3.1 METHOD OF ESTIMATION OF RESERVE

Volumetric method is adopted for calculating reserves of sand. Reserves are estimated on the basis of established width, thickness, and strike length based on influence of the mineralized formation in the river bed. Where good inferences are available only such area are considered for reserve estimation. The depth is considered up to 3.0 m as working is permitted up to 3.0m depth in the riverbed.

Geological & Mineable reserves

PROVED RESERVES

a) Following special conditions which are applicable for excavation of minor mineral(s) from river beds in order to ensure safety of river-beds, structures and the adjoining areas are considered while calculating the reserves of this area:

(i) No mining would be permissible in a river-bed up to a distance of five times of the span of a bridge on up-stream side and ten times the span of such bridge on down-stream side, subject to a minimum of 250 meters on the up-stream side and 500 meters on the down-stream side;

(ii) There shall be maintained an un-mined block of 50 meters width after every block of 1000 meters over which mining is undertaken or at such distance as may be directed by the Director or any officer authorized by him;

(iii) The maximum depth of mining in the river-bed shall not exceed three meter from the un-mined bed level at any point in time with proper bench formation;

(iv) Mining shall be restricted within the central 3/4th width of the river/ rivulet;

(v) A barrier of 7.5 m width will be left from the lease boundary, if falling in the river bed.

b) River is not having any water flow during post monsoon period and sand bed remains dry.

c) **Mineral reserves are calculated up to 3 m depth from river bed surface RL.**

d) Mineral Reserves falling in the river bed area has been calculated taking the maximum permissible depth of 3 m from the river bed surface RL.

e) The bulk density of Sand is considered 1.80.

f) Volumetric method is adopted for calculating reserves of Sand.

g) The mineable reserves are calculated by deducting "Blocked Geological Reserves on account of river banks, lease boundary, railway line, highways, bridges, (where ever applicable) from total proved Geological Reserves".

h) It is considered that river bed Sand shall be replenished every year as evident from preceding paragraph (3.2.6) on " Annual Replenishment of Mineral in River Bed Area vis-à-vis Sedimentation"

UNFC classification – Codes of UNFC are followed for reserve calculation

1. UNFC is a three digit code based system, the economic viability axis representing the first digit, the feasibility axis the second digit and the geological axis the third digit. Each digit provided.
2. Codes 1, 2 and 3 in decreasing order. The highest category of resources under UNFC system has code (111) and for lowest category the code is (334).
3. Code (111): This code is provided for the economically mineable part of the measured mineral resources (proved category reserves).
4. Code (121): This code is provided for the economically mineable part of the indicated mineral resources (probable category reserves).
5. Code (211): The part of the measured mineral resources (proved category), which as per feasibility study has not found economically mineable. The reserves blocked in 7.5 meters buffer zone and 50 meters from permanent structure.

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6. Code (222): The part of the indicated mineral resources (probable category), which as per feasibility study has not found economically mineable. The reserves blocked in 7.5 meters buffer zone and 50 meters from permanent structure.

7. Code (480): Tonnage, Grade and mineral contents can be estimated with low level of confidence and resources are also inferred from geological.

i) The reserves of Sand calculated by volumetric method and are
All reserves are proved reserves. Details are given as below.

1. The entire reserves of Sand up to the depth of 3.0 m are calculated.
2. The bulk density of sand is considered 1.80 MT/CUM
3. The reserves of Sand calculated by volumetric method and are summarized here below:

Reserves in MT= Area in acres x4000X depth 3.0mx Bulk Density 1.80

Table : Geological Reserves

Mining area in acres	Ancillary area in acres	Geological Reserves MT	Blocked area in acres	Blocked reserves MT	Mineable reserves MT	Targetted Production
62.66	20.98	1353456	5.04	2,72,160	10,81,296	10,80,000

A) PROVED RESERVES AS PER UNFC CODE (111)

Total Geological reserves: 62.66 x4000 x3.0x1.80 = 13,53,456 MT

B) BLOCKED RESERVES AS PER UNFC CODE (211 & 222) =

Blocked area =5.04 acres)

Total Blocked reserves=5.04 x 4000x 3 x1.80 = 2,72,160 MT

C) MINEABLE RESERVES =(A-B) = 10,81,296 MT

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D) TARGETED PRODUCTION

10,80,000 MT per Year up to the lease period (or say 1.080 Million MT/year)

E) Balance reserves & Life of Mine

For Balance reserves it is presumed that the mineral will be replenished every year during the rainy season. New mineral will be added every year in the river bed.

Period of Anticipated life of mine cannot be estimated accurately in the riverbed since the quantum of sand replenished every year depend on the intensity of flood waters from upstream side and proposed rate of production.

4.0 DETAILS OF PRODUCTION & DISPATCHES OF FIVE YEARS

This is a new lease area allotted to the applicant. As it is a new mine. Preproduction activities are required. Roads from lease boundary to entry to the mining area, from mining faces to the proposed exit area, from ground level to the mining area, to the mines office complex, plantation area, and to the garage / workshop & Access roads / haul roads are proposed to be developed.

The Future production programme has been planned as per the details given below:

4.1 RIVER SAND MINING WITH SIMULTANEOUS RECLAMATION

fully mechanized mining with simultaneous reclamation and pollution free mining method shall be adopted. River sand used for construction industry is available all along the river Yamuna in the plains of Haryana. Yamuna River flows along some major towns of Haryana from North to South like Yamuna Nagar, Karnal, Panipat, Sonepat, Faridabad and Palwal. The sand is a minor mineral and falls under the preview of the Mines and Geology Department , State of Haryana.

The sand mines of Sultanpur Unit District Palwal are approachable from Highway No.-2 and are about 15 -18 Kms on the East side from the highway. The villages of Sultanpur and Atwa are well connected with mettle road network. The same will be used to take the mineral transported to various destinations.

4.2 Mine Roads

All villages in the proposed lease area of Sultanpur Unit are connected by metal roads . The mine roads branching off the village roads, are well consolidated to prevent sinking of heavy truck wheels (IVA), the mine roads are at least 10 mtrs wide to permit easy maneuverability of trucks, provide cross-over's and changing points. To keep pollution off the mine, dust is proposed to be supressed by spraying roads with water at intervals of 3 hrs by using tractor/truck mounted water sprinklers. The water for this purpose is obtained from tube wells located nearby.

4.3 Proposed Method

Mining work will be carried out by mechanized method by forming one bench of 3 m high in river bed. There are no existing pits at present as the mining activities are closed for the last few years. The sand will be excavated by backhoe type excavators directly loading into dumpers/ trucks for dispatch to consumers situated in and around Delhi/NCR. Loading of mineral shall be mechanical, while transport of mineral out bye the river bed shall be done through private truck owners.

Salient Points of Proposed Scientific Mining are:

a) First requirement is to ascertain the maximum depth to which mineral is available and safe depth of working which has been fixed as 3.0 m in river bed in virgin areas.

b) All proposed pits have been proposed for further deepening and widening upto the above proposed depths.

c) The depth of pit below the surface shall not exceed 3.0m in virgin areas where mining operations to some depth have not been carried out provided mining operations are carried out by formation of benches in accordance with the provisions of MMR 1961.

d) The contractor shall comply with all other conditions and stipulations as given in the LOI and Auction document dated 25-05-2022

e) No mining operation may be carried out from 01-07 to 15-09 every year (rainy season)

f) Mining will be carried out about in about 270 days in a year.

Production Programme (Plate no.4)

Lease has been allotted for a period of 8 years only. Lease area consists of 25.06 ha area in 2 villages in a total stretch of about 1.50 km. Out of this about 5.04 hectares area is under restricted zone. About 20.02 hectare area is free from restriction and the mining is proposed in this area only. Mining is proposed in both village river bed areas at a time.

S.no	Name of Quarries	Area free from restrictions in hectares	Per day production MT	Year wise production MT	Area needed for production in ha
1	Sultanpur Block	20.02	4000	10,80,000	20.00

Daily production proposed =4000tons

Production programme is 160 trips/ day @ 25 ton per trip

Working days have been taken as 270 days per annum.

Projected Production per Year = 270 x4000 = /10,80,000 Tons

Table : Five Years Proposed Production Details (MT/A)

Year	Trips/ day	MMTPA
I	160	1.080
II	160	1.080
III	160	1.080
IV	160	1.080
V	160	1.080

5.0 PHYSICAL AND GEOLOGICAL CHARACTERISTICS OF THE DEPOSIT

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

6.0 DETAILS OF MINING MACHINERY DEPLOYED OR TO BE DEPLOYED AND THE DETAIL SPECIFICATIONS

This is a new mining lease. Following equipments are proposed to be deployed for the desired production.

Table: List of Machinery

S. No.	Name of machinery	Capacity	Nos.
1	Excavator cum loader	2.0 m^3	4
2	Tippers/ Trucks	25 tons	36
3	Water Tanker	4000 liters	2
4	Light vehicles	--	1

6.1 Fuel Consumption

Quantity of Diesel / Energy fuel Consumption per day: -

S. No.	Machine	Details of Diesel requirements	Consumption of Diesel (in ltr.)
1.	Dumper	(Considering diesel consumption by the dumper is 3 km / ltr.) Total Diesel consumption for 36 Dumper = 36x50 = 1800Ltr	1800
2.	JCB	Diesel consumption 10ltr / hr working of 20 hrs diesel consumption = 20 x20x4 =1600 ltr	16000
3.	Water Tankers	Diesel consumption 10 ltr/Hour x10 x 2=200	200
6.	Light Vehicles	Diesel consumption 8 ltr/Hour x 10 x1=80 itr	80
		Total diesel requirements per day	**3680**

7.0 METHOD OF MINING

2610816/2023/Estt.Br

River bed mining is for extracting sand from Yamuna River bed. As per Haryana Minor Mineral Concession Rules, 2012 extraction is limited to 3.0 m depth only. Major part of the River bed remains dry except rainy season. Area available for mining is 25.06 ha in district –Palwal. Total length of the area as per the description report stretches in the length of 1.50 km. Mining activity will be carried out in allocated areas only, enclosed as **Annexure –I.**

Activities will be carried out as per the production schedule given earlier. The mining quarry will be working as self sustained units with all facilities like site office, rest shelter, first aid and drinking water etc. All these mines will be connected suitably with communication system.

Light weight excavators/JCB will be deployed for extraction. Mineral will be removed in 3.0 m layer only forming one bench. This is as per the digging depth of the equipments. Mineral will be loaded in trucks of 25 tons capacity. Trucks and equipments will be on hire basis. There will be no OB or waste generation as the sand is exposed in the river bed.

Bench will advance parallel to the banks of the river. Height of bench will be 3.0 m. Width of the bench will be around 20.0 m. Workings will be restricted within the lease area/ khasra as per the description report given by Mining Department. Mining activities will be carried out in a manner so that there is no obstruction to the movement of water flow, if any, during rainy season. The bench will be in the form of slices/ strips parallel to the banks of the river. Roads in the lease area for the movement of loaded trippers/ trucks will not have slopes more than 1 in 20. However, movement of trucks after mineral loading will be towards both sides through approach roads connecting to tar roads. Every block will have its own approach roads, well connected to main highways. No processing of mineral will be done.

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7.1 Proposed year wise development for five years

Sand lease has been granted for a period of 9 years only. Calendar plan has already been made and details have been given. Sequence of operation has been depicted in **Plate No – 4**

Ultimate limit will be 3.0 m below existing bed level as indicated in the working section.

7.2 Proposed rate of production when the mine is fully developed

Work will be carried out for 270 days in year. Year wise production during the plan period will be as follows:

Table : Proposed Production

Year	Targeted Production MMT/annum	OB/ Waste (M^3)
1	1.080	-
2	1.080	-
3	1.080	-
4	1.080	-
5	1.080	-

7.3 Mineable reserves and anticipated life of the mine

Lease will be granted for a period of 8 years only as per HMMCR, 2012. During rainy season there is replenishment of the mineral, which helps in sustaining the production.

Estimated Minable reserves up to 3.0 m available are = 10,80,000 MT which are replenished every year during rains.

2610816/2023/Estt.Br

Anticipated production during lease period will be = 8.64 million MT

7.4 Proposed method of mining

Mining activity will be carried out by open cast mechanized method.

- Light weight excavators will be used for digging & loading of mineral in tippers.
- No OB/ waste material will be produced.
- No drilling/ blasting is required as the material is loose in nature.
- Proper benching of 3.0 m height will be maintained.
- Roads will be properly made and sprayed by water for suppression of dust.
- Roads in the lease area for the movement of loaded trippers/ trucks will not have slopes more than 1 in 20.
- Total extent of lease is 1.50 km .
- Extraction activities will start in the blocks from the upstream side to downstream side. This will not obstruct the movement of water, if any, during monsoon period in the river course.
- 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. n case during any period, the replenishment was found less than 3 m or depth of exaction, the mining during said period would restrict to depth which would not be more than 3 m of the original level of the river bed.

As per MMR 1961, following precautions shall be undertaken during operations of HEMM.

Shovel/ excavator: -

1. Excavators will be provided with efficient warning devices, front & rear lights and efficient brakes.
2. Excavator will be under the charge of a competent person authorized in writing by the manager designated as operator.

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3. No person other than the operator or his helper if any will ride on the excavator or even enter the excavator's cabin.
4. No person will be permitted to ride in the bucket of a Shovel/ excavator.
5. No inflammable material will be stored in the excavator housing or cab.
6. Shovel/ excavator dippers will be lowered to the ground during greasing operation.
7. When a Shovel/ excavator is to be moved from one point to another its boom shall be kept in strict alignment with direction of travel while the bucket/ dipper shall be held m above the ground.
8. No Shovel/ excavator will be operated in the position where any part of the machines, suspended loads or lines are brought closer than 3 m to the exposed high voltage line.
9. Every movement of a Shovel/ excavator shall be preceded by warning signals.
10. When not in use, the Shovel/ excavator will be moved to and stood on stable ground, the bucket shall be kept resting on stable ground and will never be left hanging.
11. The Shovel/ excavator will be so spaced that there will be no danger of accident from flying & falling objects.
12. Safety appliances, booms will be examined thoroughly once in a year.
13. Emergency switches, safety limit switches will be examined and tested once in four months.
14. All brakes will be tested for their operation worthiness once in a week.
15. The following signboards will be carried in and around the machine: -
    - I. "Warning— Do Not Enter The Working Range Of The Machine".
    - II. "Lubricating Prohibited While the Machine in Running Condition".

Duties of Shovel/ excavator operator: -

1. At the commencement of every shift the operator will personally inspect and test the machine, paying special attention to the following details: -
    - (i) The brakes and every warning device are in working order.
    - (ii) Lights are in working order.
    - (iii) The operator will neither take out the machine for work nor will he work the machine unless he is satisfied that it is mechanically shown and in efficient working order.

(iv) The operator will maintained a record of every inspection made in a bond paged book, kept for the purpose and shall sign every entry made there in.

(v) The operator will keep the cab window clean so as to ensure clear vision at all times.

(vi) The operator will not operate the machine when persons are in such proximity as to be endangered.

(vii) Before leaving the machine, the operator will lower the bucket to the ground.

(viii) The operator will not leave his machine during the shift. Whenever, he finishes his work, he will hand over the machine to his relief or lock the excavators cab.

(ix) The operator will not allow any unauthorized person to ride on the machine.

Dumper: -

1. Every dumper will be provided with efficient brakes.
2. Efficient audible warning devices will be provided with the dumpers.
3. The dumper, if required to work after daylight hours, efficient headlights and taillights will be used.
4. Every dumper will be under the charge of a competent person, authorized in writing by the manager.
5. No person, other than the driver or his helper, if any, will ride on a dumper.
6. No person will be permitted to ride in the running board of a dumper.
7. The loaded dumpers will not be reversed on gradients.
8. Sufficient stop blocks will be provided at every tipping point and these will be used on every occasion when material is dumped.
9. Standard traffic rules shall be adopted and followed during movement of all dumpers. They shall be prominently displayed at relevant places in the opencast workings and haulm roads.
10. When not in use, every dumper will be moved to and stood on proper parking places.

11. No person will be permitted to work on a chassis of a dumper, with the body in rest position, until after the dumper body has been securely blocked in position.
12. The mechanical wised mechanism will not be depended upon to whole the body of a dumper in a rest position.
13. No unauthorized person will be permitted to enter or remain in any turning points.
14. While inflating tyres, suitable protective cages shall be used.
15. Tyres will never be inflated by sitting either in the front or on the top of the same.
16. While the vehicle is being loaded / unloaded on gradient, the same will be secured stationary by the parking brake, and other means suitably designed stopper block, which could be placed below the tyres.
17. At least once in every two weeks the brakes of every dumper will be tested as below: -
    (a) Service Brake test: - The brake will be tested on a specified gradient and speed when the vehicle is fully loaded. The vehicle should stop within the specified distance when the brake is applied.
    (b) Parking brake test: - The parking brake shall be capable to hold the vehicle when it is fully loaded and placed at the maximum gradient. Maximum gradient of the roadway which is permitted only for a period of at least 10 minutes.
    (c) A record of such test will be maintained in a bound paged book and will be signed by the competent person carrying out the test. These records will be countered signed by the engineer and manager.
    (d) All vehicles shall be tested and examined once at least in every 6 months.
    (e) A notice shall be displayed outside every vehicle that **"No Unauthorized Travelling allowed".**

Duties of dumper operators: -

1. At the commencement of every shift, the operator shall personally inspect and test the machine, paying special attention to the following details: -
    (i) Tyre pressure, brakes, horn and the Lights are in working order.

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(ii) The driver will neither take out the machine for work nor will he work the machine unless he is satisfied that it is mechanically shown and in efficient working order.

(iii) The driver will maintained a record of every inspection made in a bound paged book, kept for the purpose and shall sign every entry made there in.

(iv) The driver will keep the cab window clean so to ensure clear vision at all times.

(v) Driver will ensure that the gear is in neutral position before stopping the engine. He will park the vehicle: -

(a) In reverse gear, on level roads and down gradients.

(b) In low gear, on up gradients.

(vi) The driver will negotiate downhill gradients in low gear, so that minimum of braking is required.

(vii) The driver will not drive too fast, avoid distractions and drive defensively.

(viii) Before crossing a road / railway line he will reduce his speed looking both directions along the road or railway line and will proceed across the road or line only if it is safe to do so.

(ix) The driver will not operate the dumper in reverse unless he has a clear view of the area behind the vehicle.

(x) The driver will see that : -

(xi) The vehicle is not overloaded.

(xii) The material is not loaded in a dumper so as to project horizontally beyond the sides of its body.

(xiii) The driver will not allow any unauthorized person to ride on the vehicle.

(xiv) When there is a poor visibility, the speed of a vehicle will be restricted in a manner that the braking distance is maintained shorter the distance of visibility.

(xv) The driver will not leave his machine during the shift. When he finishes his work, he will hand over the machine to his reliever or lock the excavators cab.

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7.5 Conceptual Mining Plan

Mine lease area will be worked in blocks for ease of operation. However, as the digging depth will be restricted to 3.0 m only, material will still be available below. This will be further replenished during rainy season. Blocks will be worked systematically as the width is limited while length is much more. Sequence of working has been shown on **Plate no –4** of Composite plan.

(i) Final Slope Angle To Be Adopted

Thickness of the bench is limited to 3.0 m only and width will be more than the height of the bench. River bank side will be protected by working in 3/4 patr of middle of the river. 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 2-3 m only.

(ii) During plan period workings will be carried out in both villages at a time in the lease 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 and waste generation during the plan period. No dumping area is needed. No outside material will be filled up in the extracted zone

a) Landuse Pattern of Mining Lease Area at Various Stages

Land use pattern will be as follows:

Table : Land Use Pattern of Mining Lease area at Various Phases

S. No.	Particulars	Present land use (ha.)	At the end of 5th year (ha.)

1.	Pit area	0.00	0.00
2.	Dump area	0.00	0.00
3.	Restricted area	5.04	5.04
4.	Mineral Storage and ancillary area,office etc	8.35	8.35
5.	Plantation (in safety zone and ancillary area)	0.00	2.00*
6.	Naturally reclaimed area	20.02	20.02
Total		**33.42**	**33.42**

*Plantation in 2.0 ha land will be done under social forestry.

* Plantation & infrastructure in restricted/ancillary area only

7.6 Blasting

Sand extraction will not require any drilling, blasting activities. It will be directly loaded in to trucks.

7.7 Mine Drainage

The River Yamuna flows from N to S which originates from the Himalayas provides the major drainage in the lease area. The general slope of the land surface is From N to S and elevation of the lease area varies from 181.30 mRL in the north end side to 176.00 mRL in south end as detailed below:

Location	River bed levels (mRL)	River bank top levels(mRL)	River area village
E-400	181.30	184.00	Sultanpur
E-500	181.25	184.00	

E-600	181.20	183.70	
E-700	181.07	183.50	
E-800	180.50	183.00	
E-900	180.25	182.50	
E-1000	179.60	182.00	
E-1100	179.50	181.50	
E-1200	179.00	181.00	
E-300	177.40	180.53	
E-400	177.33	180.30	
E-500	177.10	180.15	
E-600	177.00	180.10	
E-700	176.92	180.00	Atwa
E-800	176.60	179.80	
E-900	176.35	179.50	
E-1000	176.00	179.00	
E-1050	176.00	179.00	

There is no flow of water in the river bed in post monsoon period. Area is having 542 mm rainfall in a year. During rainy season, catchment water flows in the river. During dry period the Sand is excavated which gets replenished during rainy period. No mining activities will be carried out during rainy season when there is water flowing in the working area.

There will be no intersection of water table as working will be carried out upto 3.0 m depth only from surface of river bed while the water level is 5 -10 m below the surface of river bed.

7.8 Water Requirement

The requirement of water for the project will be as under

Sr.no	Activity	Requirment in KLD	Source
1	Dust suppression	15.0	Tube wells
2	Drinking	2.0	Tube wells

3	Green belt	3.00	Tube wells
	Total	20.00	

8.0 YEAR WISE ANNUAL PROGRAMME OF MINING FOR NEXT 5 YEARS

Sand mineral is targeted for 4000 tons per day i.e. 1.080 million tones per annum (maximum). Extraction is planned for 5 years duration which is proposed to be continued up to lease period. Production programme is given below:

Table: Production Programme

Year	Targeted Production (in MMTA)	OB/ Waste (M^3)
1	1.080	-
2	1.080	-
3	1.080	-
4	1.080	-
5	1.080	-

9.0 DETAILS OF EMPLOYMENT

Statutory personnel as detailed below are proposed to be deployed by project proponent as per requirement of Mines Act-1952 and latest DGMS circulars.

Table : Employment Details

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S. No.	Category	Numbers
1	Manager – Ist Class	1
2	Assistant managers	2
3	Foreman/Mates	2
4	Supervisory staff	2
5	Skilled personnel	40
6	Semi-skilled personnel	10
7	Un-skilled personnel	10
Total		67

ENVIRONMENT MANAGEMENT PLAN

10.0 MEASURES TAKEN AND TO BE TAKEN FOR LAND RESTORATION, RECLAMATION AND PLANTATION IN/ OR NEARBY LEASE AREA

- Envisaged mining operation will be carried out in the River bed. This will be dry bed mining. There will be no mining activities when there is flow of water in the working zones. During rainy season, the activities will be stopped, if there is flow in the river.
- Besides resource extraction, following activities will be kept in view:
  a) Protection and restoration of ecological system
  b) Prevent damages to the river regime
  c) Protect riverine configuration such as bank erosion, change of water course gradient, flow regime etc.
  d) Prevent contamination of ground water

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Safeguard Measures

While carrying out mining activity following measures will be taken:

- Mining activities will be carried out only in dry bed. No in stream mining will be practiced.
- Identification of river stretches for mining will be completed.
- There will be no mining near the banks. This is to protect the bank erosion and river migration.
- Mineral Sand from river will be restricted to a maximum depth of 3.0 m from the existing bed level. This is for safety and sustainability.
- As the lease area is quite large and long in length, systematic extraction will be carried out to prevent seasonal scouring and enhanced erosion.
- Extraction will be carried out in a manner that there is no obstruction to flow of water, if any, during rainy season.
- Mining on the concave side of the river channel should be avoided to prevent bank erosion. Similarly meandering segment of river will be selected to prevent natural eroding banks and to promote mining on natural building (aggrading) meanders component

Reclamation of Mined Out Area (plate no.5)

There is no generation of OB/ waste material. No backfilling has been proposed in the excavated zone. River bed will be replenished by sediments during rainy season.

Greenbelt

In order to restore the environment and ecological balance in the area affected by mining, a forestation is considered to be an effective measure. Afforestation is a major thrust area in pollution control of mining. Afforestation is suitable for detecting, recognizing and reducing air pollution effects. Tree functions as sinks of air pollutants, besides their bio-aesthetical values, owing to its large surface area. The green belt supplements Oxygen to the atmosphere and combat air pollution effectively and aesthetic beauty and landscape of the area improves. It

also checks soil erosion and make eco-system and climate more conducive.

Following factors will be considered while selecting species for plantation:-

i) Fast growing plant species shall be preferred.
ii) The plant will be of deep rooting system.
iii) The plant will be perennially green to improve aesthetic beauty of the area.
iv) The plant species will be adoptable to the local climatic conditions.
v) Native plant species will be planted.

Forestation programme shall be carried out basically, along the mine boundaries and roads as permitted by land owners. The mining area in the river bed is devoid of any vegetation, will not cause any harm to riparian vegetation cover.It is proposed to have plantation on both sides of the roads as greenbelt to provide cover against dust dissemination. Plantation will also be carried out as social forestry programme in villages, school and the areas allocated by the Panchayat/ State authorities.

Native plants like Neem, shisham, , Mango and other local species will be planted. A suitable combination of trees that can grow fast and also have good leaf cover shall be adopted to develop the greenbelt. It is proposed to plant 5,000 no's of native species along with some fruit bearing and medicinal trees during the plan period.

The lease area is in the river bed and devoid of any vegetation. Mining activities will not cause any harm to riparian vegetation cover as the working will not extend beyond the offset left against the banks in the river. Land on both sides is the private agriculture land. Link road from the active zone pass through the areas. It is proposed to have plantation on both sides of the roads as greenbelt to provide cover against dust dissemination. River banks will be strengthened by way of plantation on the banks. Plantation will also be carried out as social forestry programme in villages, school and the areas allocated by the Panchayat/ State authorities.

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Native plants like Neem, Pipal, Khejri, Mango and other local species will be planted. A suitable combination of trees that can grow fast and also have good leaf cover shall be adopted to develop the greenbelt. It is proposed to plant 5000 no's of native species @ 1000 plant/ha along with some fruit bearing and medicinal trees during the plan period.

Table: Green belt Programme

Year	Saplings to be planted	Survival 80 %	Species	Place of Plantation
I	1000	800	Neem, Peepal, Mango, Shisham, Sirish, Babool, Gulmohar.and other local fruity plants	Along the roads, Along the river banks in schools and public building and other social forestry programme.
II	1000	800		
III	1000	800		
IV	1000	800		
V	1000	800		
Total	**5000**	**4000**		

11.0 MEASURES TAKEN AND TO BE TAKEN FOR PROTECTION OF ENVIRONMENT IN AND AROUND MINING LEASE AREA

- Dry bed mining will only be carried out.
- Mining activities will be confined to 3.0 m depth from surface level of river bed.
- All link roads from the mining area to the tar road will be properly sprayed with water for dust suppression.

- Greenbelt and plantation on road side and river banks will help in dust suppression and will also reduce noise level.
- Plantation will improve ecology and aesthetic beauty of the area
- Measures will be taken to prevent the workings from extending in safety zones, cutting the banks and exceeding 3.0 m depth limit from the river bed surface.

12.0 MEASURES TAKEN AND TO BE TAKEN FOR DUMPING OVERBURDEN, STACKING OF TOP SOIL AND UTILIZATION OF TOP SOIL

There is no top soil in the lease area. No overburden and waste is likely to be generated during lease period. There will be neither any stacking of soil nor creation of OB dumps.

13.0 MEASURES TAKEN AND TO BE TAKEN FOR THE CONTROL OF WATER, NOISE AND AIR POLLUTION

Air Pollution:

Emission of gases and dust takes place due to movement of vehicles. Spraying of water and plantation along the road side prevents the spread of dust. Plantation also acts as barrier for restricting pollution. Impact on air environment has been assessed taking in to consideration the proposed production and increase emissions. The sources of air pollution are given below:

- Operation of mining machinery/ loading operations
- Transportation of mineral
- Wind erosion from barren area and river bed

Air pollutants released during production can be checked by:

1. Plantation road side as it will prevent the spreading of dust.
2. Water spraying will be done twice in a day over the haul road & roads leading to adjoining state roads.

3. Dust respirators will be provided to the operators of the heavy earth moving machineries.
4. Preventive maintenance shall be carried out of equipment.
5. At every work place where, the air borne dust generated, to be sampled and the concentration of the respirable dust will be determined regularly. If any measurement at any workplace and at source, the concentration in excess of 50% or 75% of the available concentration of permissible limit then measurements shall be carried on, at intervals not exceeding 3 months or 1 month respectively.
6. Silencers will be fitted to the dumpers.

The following table indicates the concentration of Ambient Air as per the CPCB guidelines:

Table -14: National Ambient Air Quality Standards

S. No.	Pollutants	Time weighted Average	Concentration of Ambient Air	
			Industrial, Residential, Rural and Other Areas	Ecologically Sensitive Area (notified by central Government)
1.	2.	3.	4.	5.
1	Sulphur Dioxide (SO^2), µg/m³	Annual*	50	20
		24 hours**	80	80
2	Nitrogen Dioxide (NO_x), µg/m³	Annual*	40	30
		24 hours**	80	80
3	Particulate Matter (Size less than 10 im) or PM_{10}, µg/m³	Annual*	60	60
		24 hours**	100	100
4	Particulate Matter (Size less than 2.5 im) or $PM_{2.5}$, µg/m³	Annual*	40	40
		24 hours**	60	60
5	Ozone (O_3), µg/m³	8 hours**	100	100
		1 hours**	180	180
6	Lead (Pb), µg/m³	Annual*	0.50	0.50
		24 hours**	1.0	1.0
7	Carbon Monoxide (CO), mg/ m³	8 hours**	02	02
		1 hours**	04	04
8	Ammonia (NH_3), µg/m³-	Annual*	100	100
		24 hours**	400	400
9	Benzene (C_6H_6), µg/m³	Annual*	05	05

10	Benzo(O) Pyerene Particulate Phae only ng/ m^3	Annual*	01	01
11	Arsenic (As), ng/ m^3	Annual*	06	06
12	Nickel (Ni), ng/ m^3	Annual*	20	20

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be compiled with 98% of the time in a year. 2% of the time, they may exceed the limits but not on to two consecutive days of monitoring.

(Source: CPCB notification Dated 18th November 2009)

Air pollutants released during production can be checked by:

- Dust suppression system/ water spraying would be adopted at mine working and loading points
- Excavation operations to be suspended during very strong wind conditions
- Afforestation will be carried out for control of dust
- Plantation with wide canopy trees along approach road will help in dust suppression
- Persons to be provided with dust mask and other personal protective equipments, particularly during summer months and dust storm periods

Transportation

- Regular water spraying on haulage roads during mineral transportation by water sprinklers,
- Avoid over loading of tippers & consequent spillage on the roads,
- Mineral carrying trucks will be effectively covered by tarpaulin to avoid escape of fines to atmosphere,
- Air quality shall be regularly monitored both in the core zone and the buffer zone.

Controlling of NOx level

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The source of NOx is due to vehicular emission. This can be controlled by proper maintenance and servicing of vehicles. Only P.U.C. certificated vehicles will be permitted

Noise Pollution

There is no drilling and blasting for mineral extraction. Noise pollution due to transportation will not cause any problem to the inhabitants of this area because there is no human settlement in close proximity to the link roads in lease area.Effective steps will be taken to keep the noise level well below the DGMS prescribed limit of 85 dBA.

Noise control is achieved by the following:

- Proper care and maintenance of the equipments will be carried out.
- Personal protective equipments will be provided to the workers.

14.0 DEMOGRAPHIC DETAILS OF THE STUDY AREA (plate no.2)

Total number of villages in which lease area falls is 2. Demographic details of the nearby villages are as follows. Main occupation is agriculture. The details are given below:-

Table: Demographic Details

Name	Households	Population	Males	Females
Rahimpur	222	1516	826	690
Kashipur	668	4639	2497	2142
LalGarh	194	1186	600	586
Sultanpur	293	1884	1000	884
Amrauli	403	2563	1300	1263
Attba	264	1516	800	716
Gulawad	1599	10302	5302	5000
Jatauli	586	3621	1980	1641
Kashipur	400	2000	1100	900

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15.0 DETAILS OF HEALTH CHECKUP AND INSURANCE OF ALL THE EMPLOYED PERSONS (FOR EXISTING LEASE)

All workers will be subjected to medical examination as per Mines Rule 1955 both at times of appointment and at least once in five years. Medical camps will be organized for this activity. Insurance of all employees as per the rules will be carried out.

15.1 Corporate Social Responsibility

As a corporate responsibility following measures along with budget provision is proposed for improving the conditions of persons in and around the project area:

The Palwal District of Haryana State is relatively less developed in respect of employment and facilities. Thus, it can be seen that the proposed project offers good potential for the local people for employment directly and indirectly. The Project Affected Persons, if any, of the lease area will be provided with compensation or job or indirect employment such as business, contract works etc. With the starting of mining operation, employment/business opportunity will increase and welfare amenities such as free medical facilities, conveyance, school, free education, drinking water supply etc will be available for the area.

The details of benefits to the people in the adjoining villages are discussed here under:

a) Employment

From the study of socio economic environment at the study area it is quite evident that the area is not quite developed as far as job opportunities and living standard of the population is concerned. Apart from cultivation, agriculture, etc mining, industries and ancillary activities play an important source of livelihood in this as well as adjoining districts.

With the start of mining operations, various employment opportunities will be generated. Several persons will be benefited with mining works, employment through contractor, running of jeep and buses, canteens, different kind of shops and transport related business avenues.

The Project Affected Persons, if any, will be provided with either compensation or direct employment or indirect employment. They would be mostly recruited in unskilled, semi-skilled

categories etc. This will improve the economic condition of the local people. The employment of local people in primary and secondary sectors of project shall upgrade the prosperity of the region.

(b) Educational facilities

Industrial on-job training will be provided to the interested local people and the trained people will be absorbed in jobs as per the requirement of the project. Proponent will also provide full cooperation and monitory assistance for adult education programme. Other activities proposed are:

1. Targeted programmes for primary education for specially girl child
2. Augmentation of infrastructure and equipments, furniture, blackboard, toilets etc inschools
3. Scholarships to meritorious students
4. Adult education & awareness about saving & investment plans.
5. Partnerships in state sponsored education programmes
6. School wall boundary maintenance
7. Existing govt. school strengthening by boundary wall construction, construction of toilets, roof repair, drinking water taps, etc.
8. Monetary contribution for expansion of govt. school from 6th to 12th class (construction of classrooms, field, toilets, taps etc.)

Capacity building activities such as following will be undertaken:

1. Scholarship for ITI training outside for 20 persons
2. Sponsorship of land losers / wards for full term courses
3. Short term courses for skill up gradation
4. Vocational training (dairy, poultry, bee keeping, sericulture)
5. Specific Programmes for Ladies (stitching, embroidery, tailoring etc)

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(c) Medical facilities

Project shall provide aid to improve the existing medical facilities in the villages and also improve awareness and provide sufficient training in hygiene, sanitation and proper diet.

Some of the activities that can be carried out are as follows:

1. Mobile Clinic with testing and diagnostic facilities
2. Health Camps for Family Planning, HIV/AIDS and other communicable diseases.
3. Addressing local health related issues through audio visuals and group meetings
4. Subsidized treatment in hospital with which tie-up will be there
5. Specific Programmes for hygiene and sanitation
6. Helping aids to each category of physically challenged as per requirement
7. Eye camps to address the issue of cataracts specially

(a) Infrastructure facilities

Infrastructure facilities like road, Post & Telegraph, Telephone, Banks etc are basics for each and every area. These facilities are already well developed in the surrounding areas. The lessee will take various steps for upliftment of the basic amenities of the area by providing drinking water, communication facilities, etc. Construction of roads, drainage, community halls, school buildings, health centers, street lighting, equipments to educational institutions, public utilities, sanitation facilities, etc in nearby area will be undertaken.

As a corporate responsibility following measures along with budget provision is proposed for improving the conditions of persons in and around the project area:

Sr No	Description	1st Year	2nd Year	3rd Year	4th Year	5th Year
1	Health check up camps	1.50	1.5	1.75	1.75	1.75
2	Insurance cover of workers	2.0	2.00	2.00	2.50	3.00
3	Assistance to local schools, scholarship to students	1.50	1.00	1.75	2.00	2.00
4	Sanitations and drinking water facilitites	1.75	1.75	1.75	2.00	2.00
5	Vocational training to persons for income generation	0.75	0.75	0.75	0.75	0.75

6	Assistance to self help groups	1.00	1.50	2.00	2.00	2.00
Total		**8.5**	**8.50**	**10.00**	**11.00**	**11.50**

15.2 Fund Provision for Environmental Management

It is proposed to create an Environment Management Fund. The contractor shall deposit/pay an amount equal to 10% of the due contract money along with installments towards the **'Mines and Minerals Development, Restoration and Rehabilitation fund.**

15.3 Fund Provision for EMP Measures: following provisions are proposed to be taken for Improving, control and monitoring of environment protection measures

Sr. No.	Particulars	Amount (in lacs)
1	Pollution monitoring – Air, Water, Noise	3.0
2	Pollution monitoring – Water sprinkling	5.0
3	Wire fencing at plantation sites	0.6
4	Plantation including maintenance	1.50
5	Rainwater harvesting	3.0
6	Haul road and other roads repair and maintenance	3.0
7	Pre-moonsoon and post monsoon survey for sedimentation in the river bed	2.0
	Total	18.10

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PART –II

PROGRESSIVE MINE CLOSURE PLAN

1.0 Introduction

Name & address of the lessee

M/s M.M.Traders,through Manjeet Kumar S/o Sh.Ved Parkash,Village Manglora Quidem,Karnal,Haryana.

(B) LOCATION OF THE LEASE AREA

Block Name	Name of Village	Pillar	Latitude	Longitude
Sultanpur	Sultanpur	G	28° 3'56.669"N	77° 29' 6.045"E
		H	28° 3'52.146"N	77° 29' 15.535"E
		I	28° 3'48.249"N	77° 29' 10.354"E
		J	28° 3'51.958"N	77° 29' 3.583"E
		Q	28° 3'44.13"N	77° 29' 31.61"E
		R	28° 3'36.68"N	77° 29' 27.15"E
		S	28° 3'50.19"N	77° 29' 13.46"E
	Atwa	Q	28° 1' 58.417"N	77° 30' 17.832"E
		Q1	28° 1' 54.900"N	77° 30' 16.700"E
		R	28° 1' 56.464"N	77° 30' 24.256"E
		R1	28° 1' 52.500"N	77° 30' 23.700"E
		S	28° 1' 54.767"N	77° 30' 30.784"E
		S1	28° 1' 51.200"N	77° 30' 28.900"E
		T	28° 1' 52.969"N	77° 30' 36.540"E
		T1	28° 1' 49.000"N	77° 30' 36.200"E
		U	28° 1' 52.095"N	77° 30' 41.268"E
		U1	28° 1' 48.300"N	77° 30' 41.600"E

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(C) EXTENT OF THE LEASE AREA

33.42 ha spread over 2 villages as explained at 2.0 in the main mining plan

(D) PRESENT LAND USE PATTERN

S. No.	Particulars	Present land use (ha.)
1.	Pit area	0.00
2.	Dump area	0.00
3.	Area for ancillary activities	8.35
4	Infrastructure (Office, Temp. shelter etc)	0.00
5.	Mineral Storage	0.00
6.	Plantation	0.00
7.	Area for mining	25.06
Total		33.42

(E) METHOD OF MINING:

Lease area allotted for mining is 25.06 ha. Total length of the proposed lease area as per the description report stretches in the length of 1.50 km. Mining activity will be carried out in allocated areas only.

Total production envisaged is 4000 TPD. Activities will be carried out as per the production schedule given earlier. These blocks will be working as self sustained units with all facilities like site office, rest shelter, first aid and drinking water etc. All these blocks will be connected suitably with communication system.

Light weight excavators will be deployed for extraction. Mineral will be removed in 3.0 m layer only forming one bench. This is as per the digging depth of the equipments. Mineral

will be loaded in trucks of 25 tons capacity. Trucks and equipments will be on hire basis. There will be no OB or waste generation as the sand is exposed in the river bed.

Mining activity will be carried out by open cast mechanized method.

- Light weight excavators will be used for digging & loading of mineral in tippers.
- No OB/ waste material will be produced.
- No drilling/ blasting is required as the material is loose in nature.
- Proper benching of 3.0 m height will be maintained.
- Roads will be properly made and sprayed by water for suppression of dust.
- Roads in the lease area for the movement of loaded trippers/ trucks will not have slopes more than 1 in 20.
- Total extent of lease is about 8 km including prohibited area.
- Extraction activities will start in the blocks from the upstream side to downstream side. This will not obstruct the movement of water, if any, during monsoon period in the river course.
- 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.

(F) MINERAL PROCESSING OPERATION:

No mineral processing is envisaged for Sand (minor mineral) produced during the mining activity.

1.1 Reasons for closure:

The progressive mine closure plan has been prepared in compliance of Haryana Minor Mineral Concession Rules 2012 under MMCR 1986. No immediate closure is planned as sufficient reserves are available to carry on the activities. There is market potential in domestic demands.

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1.2 Statutory Obligations:

The lessee is bound to submit the Progressive mine closure plan either with Mining plan or Scheme of Mining.

Lessee is bound to follow the terms and conditions as will be stipulated in the lease deed.

In addition to it the rules pertaining to the Protection of Environment i.e Environment Act. Environment Rules and other associated rules for the protection of environment will have to be followed.

During the course of mining the rules stipulated in Mines Act, Mines rules Metalliferous Mines Regulation 1961 and RMMCR.1986 will be followed.

All other rules pertaining to the mining existing at that time will be followed during the course of mining activities.

1.3 Closure plan preparations

NAME, ADDRESS AND REGISTRATION NUMBER OF THE RECOGNISED PERSONS WHO PREPARED THE PROGRESSIVE CLOSURE PLAN AND NAME AND ADDRESS OF THE EXECUTING AGENCY WHO IS INVOLVED IN THE PREPARATION OF PROGRESSIVE MINE CLOSURE PLAN.

D.C.Yadav

Regd. No RQP/DMG/HRY/2018/03 **(Annexure-III)**

Lessee will himself implement the closure plan; no outside agency will be involved.

2.0 MINE DESCRIPTION

2.1 General Geology and Local Geology

2.1.1 Regional Geology - Explained at item no.3.2.1 of the mining plan.

2.1.2 LOCAL GEOLOGY –Explained at 3.2.2 of the main document Mining plan

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2.2 **Reserves-**

j) **Mineral reserves are calculated up to 3 m depth from river bed surface RL.**

All reserves are proved reserves. Details are given as below.

The entire reserves of Sand up to the depth of 3.0 m are calculated.

The bulk density of sand is considered 1.80 MT/CUM

The reserves of Sand calculated by volumetric method and are summarized here below:

Reserves in MT= Area in acres x4000X depth 3.0mx Bulk Density 1.80

Table : Geological Reserves

Mining area in acres	Ancilary area in acres	Geological Reserves MT	Blocked area in acres	Blocked reserves MT	Mineable reserves MT	Targetted Production
62.66	20.98	1353456	5.04	2,72,160	10,81,296	10,80,000

A) PROVED RESERVES AS PER UNFC CODE (111)

Total Geological reserves: 62.66 x4000 x3.0x1.80 = 13, 53,456 MT

B) BLOCKED RESERVES AS PER UNFC CODE (211 & 222) =

Blocked area =5.04 acres)

Total Blocked reserves=5.04 x 4000x 3 x1.80 = 2, 72,160 MT

C MINEABLE RESERVES =(A-B) = 10,81,296 MT

D TARGETED PRODUCTION

10,80,000 MT per Year up to the lease period (or say 1.080 Million MT/year)

E) Balance reserves & Life of Mine

For Balance reserves it is presumed that the mineral will be replenished every year during the rainy season. New mineral will be added every year in the river bed.

Period of Anticipated life of mine cannot be estimated accurately in the riverbed since the quantum of sand replenished every year depend on the intensity of flood waters from upstream side and proposed rate of production.

2.3.1 Mining Method

Mining method to be followed is described in chapter of mining at 7.0 in mining plan.

2.4 Mineral Beneficiation

No mineral beneficiation is envisaged.

3.0 Review of implementation of mining plan including five years progressive closure plan upto the final closure plan

Mining Plan and Progressive mine closure plan are being submitted for the first time. It will be reviewed after five years and review of implementation will be given with next mining scheme.

4.0 CLOSURE PLAN

4.1 Mined - out land

About 20.02 hectare area is available for mining. Land use at various stages is given in the table below:

Table : Land Use

Sr. No.	Particulars	Present land use	Land use at the end of 5

		(ha.)	years (ha.)
1.	Pit area	0.00	0.00
2.	Dump area	0.00	0.00
3.	Area for ancillary activities	8.35	8.35
4	Infrastructure (Office, Temp. shelter etc)	0.00	0.00
5.	Mineral Storage	0.00	0.00
6.	Plantation	0.00	0.00
7.	Area for mining	25.06	25.06
	Total	**33.42**	**33.42**

4.2 Water quality management

Mining is being proposed in the river bed in the river Yamuna. The general water table in the area is 5-10 m, . There are no surface or ground water bodies within the lease area except the running water in river Yamuna the quantum of which varies throughout the year depending on rains and release of water from dams upstream.

There is a little flow of water in the river bed in post monsoon period. Area is having 542 mm rainfall in a year. During rainy season, catchment water flows in the river. During dry period the Sand is excavated which gets replenished to some extent during this period. No mining activities will be carried out during rainy season when there is flooding in the working area.

There will be no intersection of water table as working will be carried out upto 3.0 m depth only from surface of river bed while the water level is 5-10 m below the surface of river bed.

4.3 Air Quality Management:

The proposed mining method is not likely to produce much of dust and fugitive emissions to cause damage to ambient air quality of the area. Workers will be provided with personnel protective equipment like face mask, ear plug/ muffs.

For air pollution management at the progressive mine closure of mine, green belt will be developed to prevent and control air pollution.

4.4 Waste Management:

As stated in mining method, there will be no OB/ waste generation and there will not be any OB/ waste dumps.

4.5 Top Soil Management

There is no top soil.

4.6 Tailing dam management

There is no proposal of beneficiation of mineral. No tailing dam is envisaged.

4.7 Infrastructure:

The infrastructure facilities like site office, first –aid station, rest shelter/ store, drinking water etc. will be established.

4.8 Disposal of mining machinery:

Machinery is proposed on hire basis. Hence no decommissioning of mining machinery is proposed.

4.9 Safety & Security:

Safety measures will be implemented to prevent access to excavation area by un-authorized persons as per Mine Act 1952, MMR 1961.

i. Safety measures will be implemented as per Mine Act 1952, MMR 1961, Mines Rules 1955.
ii. Provisions of MMR1961 shall be followed strictly and all roads shall be 10 m wide and have a gradient of not more than 1 in 20.

iii. Excavation will be not more than 3 m depth.

iv. Width of bench will be kept around 20.0 m for ease of operations and provide sufficient room for the movement of equipments.

v. Protective equipment like dust masks, ear plugs/ muffs and other equipments shall be provided for use by the work persons.

vi. Notices giving warning to prevent inadvertent entry of persons shall be displayed at all conspicuous places and in particular near mine entries.

vii. Danger signs shall be displayed near the excavations.

viii. Security guards will be posted.

ix. In the event of temporary closer, approaches will be fenced off and notice displayed.

4.10 Disaster Management and Risk Assessment:

This should deal with action plan for high risk accidents like landslides, subsidence, flood, inundation in underground mines, fire, seismic activities, tailing dam failures etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The capability of lessee to meet such eventualities and the assistance to be required from the local authorities should be described.

- The shallow depth of activities in river bed mining will not involve any high risk accident due to side falls/collapse.
- The complete mining operation will be carried out under the Management and control of experienced and qualified Mines Manager having Certificate of Competency to manage the mines granted by DGMS.
- All the provisions of Mines Act 1952, MMR 1961 and Mines Rules 1955, RMMCR 1986 and other laws applicable to mine will strictly be complied with.
- During heavy rainfall the mining activities will be closed.
- All persons in supervisory capacity will be provided with proper communication facilities. Competent persons will be provided FIRST AID kits which they will always carry.

4.11 Care and Maintenance during Temporary Discontinuance:

In case of any temporary discontinuance due to court order or due to statutory requirement or any other unforeseen circumstance following measures shall be taken for care, maintenance and monitoring of conditions.

- Notice of temporary discontinuance of work in mine shall be given to the DGMS as per the MMR 1961.
- All the mining machinery shall be shifted to a safe place.
- Entrance to the mine or part of the mine, to be discontinued shall be fenced off. Fencing shall be as per the circular 11/1959 from DGMS.
- Security Guards shall be posted for the safety and to prevent any unauthorized entry to the area.
- Carry out regular maintenance of the facilities/area detailed below in such a way as would have been done as if the mines were operation:
    - Mine roads and approach roads,
    - Fencing on approach roads,
    - Checking and maintenance of machines and equipment,
    - Drinking water arrangements,
    - Mine office, first aid stations etc.
- Competent persons shall inspect the area regularly.
- Air, water and other environmental monitoring shall be carried out as per CPCB and IBM Guideline.
- Care and upkeep of plantation shall be carried out on regular basis.
- Status of the working and status monitoring for re-opening of the mines shall be discussed daily.

In case of discontinuance due to any natural calamities/abnormal conditions, mining operation will be restarted as early as possible after completing rescue work, restoring safety and security, repairs of roads etc.

5.0 ECONOMIC REPERCUSSION OF CLOSURE OF MINE AND MANPOWER RETRENCHMENTS

Lease area will be granted for a period of 8 years only. As per the production programme envisaged, at the end of lease period, still sufficient un-worked area would be left available for continuing production activities further. Hence, no closure is planned. There will be no affect on the man power as the persons belong to nearby villages and will have an option either to be available for employment for the next contract/ lease or do the agriculture in their fields.

6.0 TIME SCHEDULING FOR ABANDONMENT

The lease area has enormous potential for continuance of operations even after the expiry of the awarded period. The details of time schedule of all abandonment will be given at the time of final closer plan. Mining activities are confined to river bed, up to 3.0 m. depth, relatively shallow depth of workings. Partial replenishment of the Sand being removed from the river bed is a natural process particularly during monsoon periods.

7.0 ABANDONMENT COST

As at present mining is not going to be closed so abandonment cost could not be assessed. However based on the progressive mine closure activities during the plan period, cost is assessed as given below:

Abandonment Cost

ACTIVITY	YEAR					Rate	Amount (in lakh Rs.)
	First	Second	Third	Fourth	Fifth		
Plantation (in no.)	1000	1000	1000	1000	1000	@ 100Rs per sapling including maintenence	5.00
Plantation cost	100000	100000	100000	100000	100000		

Wire fencing (meter)	500	500	500	-	-	@ of 200Rs per meter	3.00
Total							**8.00**

8.0 FINANCIAL ASSURANCE

Total 33.42 ha area will be put in use upto the end of the plan period. Details of area put in use as given below (As per circular No.4/2006 issued by CCOM, Nagpur following table has been considered for calculation for financial assurance).

S. No.	Particulars	Present land use (ha.)	Land use at the end of 5 years (ha.)
1.	Pit area	0.00	0.00
2.	Dump area	0.00	0.00
3.	Area for ancillary activities	8.35	8.35
4	Infrastructure (Office, Temp. shelter etc)	0.00	0.00
5.	Mineral Storage	0.00	0.00
6.	Plantation	0.00	0.00
7.	Area for mining	25.06	25.06
Total		**33.42**	**33.42**

MINING PLAN & PROGRESSIVE MINE CLOSURE PLAN FOR SAND IN SULTANPUR BLOCK PALWAL ,AREA-33.42 ha. District Palwal (Haryana) Open cast mechanized

Calculation for Financial Assurance

S. No.	Item	Area put on use at start of plan (Ha) (A)	Requirement at the end of plan period (Ha)	Total area put to use (Ha) (B)	Area considered as fully reclaimed & rehabilitation (Ha) (C)	Net area considered for calculation (Ha) D = (B-C)
1.	Area to be excavated	0.0	20.02	20.02	0.0	20.02
2.	Storage for topsoil	0.0	0.0	0.0	0.0	0.0
3.	Overburden/ dumps	0.0	0.0	0.0	0.0	0.0
4.	Mineral storage	0.0	8.35	8.35	0.0	8.35
5.	Infrastructure (Workshop, Adm. Building & Road)	-	0.50	0.50	0.50	0.00
6.	Safety zones	0.0	5.04	5.04	0.0	5.04
7.	Green belt	0.0	2.0*	2.00	2.00	0.0
8.	Tailing pond	0.0	0.0	0.0	0.0	0.0
9.	Effluent treatment plan	0.0	0.0	0.0	0.0	0.0
10.	Mineralseparation plant	0.0	0.0	0.0	0.0	0.0
11.	Township area	0.0	0.0	0.0	0.0	0.0
12.	Others to specify	0.0	0.0	0.0	0.0	0.0
Total		0.0	33.42	33.42	0.0	33.42

Total 33.42 ha area will be put in use. Against this mined out area the total financial assurance (@15000/- per ha. Comes out to Rs 501300 / which will be deposited in the form of Surety bond/ bank guarantee to the Director Mines & Geology Haryana.

9.0 CERTIFICATE

It is enclosed with the report.

10.0 PLAN AND SECTION

Plan and section are prepared and enclosed with the mining plan.

Duli Chand Yadav
DMG/HRY/RQP/2018/03

2610816/2023/Estt.Br

Certificate

Certified that the mining Plan for Sand in Sultanpur Unit over an area of 33.42 hectares covered under survey of India Toposheet 53E/5,9 and 53 H/8,12 has been prepared in full consultation with me and I have understood its contents. I agree to implement the same in accordance with law.

Applicant

APPROVED

Deepak Kumar

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Certificate

I, D.C.Yadav, duly recognized qualified person to prepare mining plan under Rule 22 C of the Mineral Concession Rules, 1960 (Revised 2016) & Haryana Minor Mineral Concession Rules 2012 ,has prepared the Mining Plan of SAND (Minor Mineral) over an area of 33.42 hectares of M/s M/s M.M.Traders,through Manjeet Kumar S/o Sh.Ved Parkash,Village Manglora Quidem,Karnal,Haryana for Sultanpur Unit falling under Survey of India toposheet No . 53E/5,9 and 53 H/8,12 .The various data and write up enclosed have been complied and verified by us. The working plan and all other details given in the plan have been prepared under my guidance and duly verified by me. The mining plan and progressive mine closure plan complies all statutory rules , regulations , orders made by the Central or State Government, statutory organizations, court etc. have been taken into consideration and wherever any specific permission is required the lessee will approach the concerned authorities

D.C.Yadav Dull Chand Yadav
DMG/HRY/RQP/2018/03
RQP/DMG/HRY/2018/03.

APPROVED
Deepak Kumar

Annx -I

Through e-mail/Speed Post

From

The Director,
Mines and Geology Haryana,
2nd Floor Plot No. 9,I.T. Park, Sector-22, Panchkula.

M/s M.M. Traders,
through Manjeet Kumar, S/o Sh. Ved Parkash,
Village Manghera Quidem, Karnal, Haryana – 132 037

Memo No. DMG/HY/Sultanpur Unit/Palwal/2022/5146
Dated Panchkula, the 17-08-2022

Subject: **Acceptance of the highest bid in respect of the minor mineral Sand contract of "Sultanpur Unit" having tentative area of 62.66 Acre/25.06 hectares in the district Palwal, offered in e-auction held on 26.06.2022/issuance of Letter of Intent (LoI)- regarding.**

You participated in the e-auction held on 26.06.2022 on the e-Auction web portal (https://minesharyana.eauctions.com/) for grant of mining contract of minor mineral sand mines after accepting the terms and conditions of the auction notice issued vide notification no. DMG/HY/Auction/Palwal/2022/3467 dated 25.05.2022 in order to obtain mining contract of minor mineral sand mine of the district Palwal.

2. You offered the highest bid of Rs. 4,56,00,000/- (Rs. Four Crores Fifty Six Lakhs only) per annum against the Reserve Price of Rs. 4,51,00,000/- for obtaining the Mining Contract of Minor Mineral Mine namely 'Sultanpur Unit' for extraction of 'Sand' having total area of 62.66 Acre/25.06 hectares. The details of the khasra number of the area under above said Mining Unit is attached as Annexure 'A'.

3. You are hereby informed that the State Government has accepted the highest bid of Rs. 4,56,00,000/- per annum offered by you in respect of 'Sultanpur Unit' under the provision of Haryana Minor Mineral Concession, Stocking, Transportation of Minerals & Prevention of Illegal Mining Rules, 2012 (State Rules, 2012). Accordingly, you have become the successful bidder in respect of above said mine.

4. The State Government having accepted the aforementioned highest bid of Rs. 4,56,00,000/- offered by you, the Department is pleased to issue this Letter of Intent (LoI) in your favour in respect of the Mining Unit/area namely 'Sultanpur Unit' subject to the following terms and conditions:

4.1 The period of the contract shall be 08 years and the same shall commence w.e.f. the date of grant of Environmental Clearance by the competent authority and the Consent to Operate (CTO) by the State Pollution Control Board, whichever is later, or on expiry of the period of 12 months from the date of issuance of LoI, whichever is earlier;

Deepak Kumar
State Geologist

2610816/2023/Estt.Br

4.2 You may note that the detail of the area of the mining unit is tentative and was notified on "as is where is basis" (refer condition no. 3.4 of the auction notice). In case of any inadvertent mistake in the area detail/Khasra number etc., the same shall be got rectified/corrected before execution of the contract agreement (refer condition no. 3.3 of the auction notice).

4.3 No request regarding reduction in bid amount on account of reduction in land/area of the Mining Block/ Unit, on any other account including that of change in description of Khasra numbers / location etc. at any stage will be entertained on any ground. This shall also include any loss/reduction of area for actual mining for want of compliance of applicable laws/restrictions for mining or part of the contracted area had already been operated in the past. Needless to state that this also includes the changes, if any, as per condition no. 3.4 of the auction notice.

4.4 You offered bid after having gone through the terms and conditions of auction notice and also the applicable Acts and Rules for undertaking mining. The State government shall not be responsible for any kind of loss to you being the highest bidders/contractor at any point of time (before or after grant of contract) on any account including on account of reduction of land/ area/ production/ non grant of permission for mining in part area or otherwise on account of any condition stipulated for undertaking mining by any competent authority.

4.5 The amount of the highest bid i.e. Rs. 4,56,00,000/- (Rs. Four Crores Fifty Six Lakhs only) per annum shall be the "Annual Contract Money" payable by you as the contractor money in the manner prescribed in the contract agreement to be executed on form MC-1 appended to State Rules.

As per orders dated 01.07.2022 of the State Government you will have to open ESCROW ACCOUNT with the Department, wherein all the sale proceed made through e-Rawaana Portal will required to be deposited.

4.6 The above said annual contract money shall be increased at the rate of 10% on completion of each block of three years. Accordingly, the year-wise amount of the annual contract money shall be as per details given below:

Sr. No.	Year of the contract Period	Annual Contract Money [in Rs.]
1	First Year	4,56,00,000
2	Second Year	4,56,00,000
3	Third Year	4,56,00,000
4	Fourth Year	5,01,60,000
5	Fifth Year	5,01,60,000
6	Sixth Year	5,01,60,000
7	Seventh Year	5,51,76,000
8	Eighth Year	5,51,76,000

4.7 As per the terms and conditions of the grant, you are liable to deposit Rs. 1,14,00,000/- i.e. equal to 25% of the annual bid amount as "Security", out of

2610816/2023/Estt.Br

which you have already deposited an amount of Rs 45,60,000/- (Rs. Forty Five Lakhs Sixty Thousand only) i.e. equal to 10% of the annual bid amount as 'initial bid security' after the conclusion of e-auction. The balance amount of Rs. 68,40,000/- of the bid security i.e. 15% of the annual bid amount shall be deposited before commencement of the mining operation or before expiry of the period of 12 months from the date of issuance of Letter of Intent (LoI), whichever is earlier.

Provided that in case having taken all steps on your part if you fails to obtain required environmental Clearance and consent to operate(CTO) for undertaking mining operations within the said period of 12 months from the date of issuance of LoI, such letter of intent holder/contractor on a specific application submitted to the Director, at least thirty days prior to the end of the period mentioned above, giving details of the action already taken may seek additional time up to another twelve months, over and above the time of 12 months already allowed for commencement of the period of contract, on payment of a non-refundable fee as per the following:-

1.	Extension of further period up to six months	On payment of a non-refundable fee at the rate of one percent per month of the annual bid for each month of requested extension period
2.	Extension for a second period up to six months	On payment of a non-refundable fee at the rate of two percent per month of the annual bid for each month of requested extension period
Note: Extension shall be allowed only in month (s) and any request for period less/part of the month shall be summarily rejected and shall apply along with advance amount of the fee for such requested period of extension		

4.8 You are directed to execute the Contract Agreement in Form MC-1 appended to the State Rules, 2012 within a period of 90 days from the date of order of issuance of this LoI.

Note: 90 days period is for execution of Contract Agreement. Therefore, it is advised to submit draft agreement along with all relevant documents preferably within 45 days, so that agreement could be executed within 90 days after completing all the formalities of scrutiny and verification.

4.9 In case of the Partnership Deed (where bidding entity is a partnership firm) or Articles of Association (where bidding entity is a registered Company) or an Affidavit (where bidding entity is a sole proprietorship firm and the bidder is participating as an Individual), no transfer or addition or deletion of the Partners/Directors will be permissible before execution of the agreement;

4.10 The Contract Agreement executed shall be got duly Registered under relevant laws with concerned Registering Authority and you will be liable to pay applicable stamp duty and registration fee etc as per the applicable rates and as demanded by the Registering Authority/Revenue Department at the time of Registration.

4.11 In case of failure to execute the agreement, after issuance of this acceptance of bid/LOI within the prescribed period of 90 days, this LoI shall be deemed to have been revoked and 10% amount of the highest bid deposited as initial bid security shall be forfeited and you will be debarred from participation in any future auctions/tenders/competitive bidding process in respect of any area for obtaining mineral concession in the State for a period of 5 years.

4.12 You shall also furnish a solvent surety for a sum equal to the amount of the annual bid for execution of the Agreement. The documents in support of solvency of the surety shall be submitted dully evaluated by the concerned Revenue Authority along with Non Encumbrance Certificate from the concerned Revenue Authority. In case the surety offered by the contractor(s) during the subsistence of the contract is not found solvent, the contractor(s) shall offer another solvent surety and a supplementary deed shall be executed to this effect.

4.13 After execution of agreement, either before commencement of the mining operation or before expiry of the time allowed, if any, as per condition No. 4.7 above, in case of failure to deposit the balance 15% amount towards security (as required under clause 4.7 above), the acceptance of bid/issuance of LoI/execution of agreement shall be deemed to have been revoked and 10% amount deposited towards as initial bid security after the conclusion of auction shall stand forfeited. Further, such bidder shall debarred from participation in any future auctions/Tenders/competitive bidding process in respect of any area for obtaining mineral concession in the State for a period of 5 years.

4.14 You shall be liable to deposit the contract money in advance at monthly intervals as per provisions of Contract Agreement i.e. from the date of commencement of the contract period.

4.15 You shall also deposit/ pay an additional amount equal to 7.5% of the due contract money along with the monthly instalments towards the 'Mines and Mineral Development, Restoration and Rehabilitation Fund.

4.16 You shall also deposit/ pay an additional amount equal to 2.5% of the due contract money along with the monthly instalments towards the 'District Mineral Fund'.

4.17 You shall also be liable to pay advance Income Tax as per provisions of Section 206(c) of Income Tax Act in addition to contract money, payable as per terms and conditions of contract agreement.

4.18 On enhancement of the contract money with the expiry of every three years period, you shall deposit the balance amount of security so as to upscale the security amount equal to 10% of the revised annual contract money as applicable for one year with respect to the next block of three years. No interest, whatsoever, shall be payable on the security amount deposited under the prescribed security head of the government;

4.19 You shall prepare a Mining Plan along with the Mine Closure Plan (Progressive & Final) from the Recognised Qualified Person as per chapter 10 of the State Rules, 2012 for the "Mining Unit" and shall not commence mining operations in any area except in accordance with such Mining Plan duly approved by an officer authorised by the Director, Mines & Geology, in this behalf.

4.20 Further, the actual mining will be allowed to be commenced only after prior Environment Clearance is obtained by you as the LoI holder/ Mining contractor for the Mining Unit from the Competent Authority as required under EIA notification dated 14/09/2006 issued by Ministry of Environment, Forests and Climate Change, Government of India or as amended from time to time and also other required approvals for mining including Consent to Establish and Consent to Operate from the Haryana State Pollution Control Board before commencement of actual mining operations.

4.21 You will also be liable to pay the following to the landowners to undertake mining operations:

(a) Annual rent in respect of the land area blocked under the concession but not being operated; and
(b) Rent Plus compensation in respect of the area used for actual mining operations.

4.22 The amount of annual rent and the compensation shall be settled mutually between the landowner and the mining contractor. In case of non-settlement of the rent and compensation, the same shall be decided by the District Collector concerned in accordance with the provisions contained in Chapter 9 of the "State Rules, 2012";

4.23 The total mineral excavated and stacked by the concession holder within the area granted on mining contract shall not exceed three times of the average monthly production as per approved Mining Plan and/or quantity approved under Environmental Clearance, at any point of time.

4.24 The Mining Contractor shall not stock any mineral outside the concession area granted on mining contract, without obtaining a valid Mineral Dealer Licence as per provisions contained in Chapter 14 of the State Rules, 2012.

4.25 The contractor shall not carry out any mining operations in any reserved/ protected forest or any area prohibited by any law in force in India, or prohibited by any authority without obtaining prior permission in writing from such authority or officer authorized in this behalf. In case of refusal of permission by such authority or officer authorised in this behalf, contractor(s) shall not be entitled to claim any relief in payment of contract money on this account;

4.26 Following are the general/ special conditions applicable for excavation of minor mineral(s) from river beds in order to ensure safety of riverbeds, structures and the adjoining areas:

2610816/2023/Estt.Br

i. No mining would be permissible in a river-bed up to a distance of five times of the span of a bridge structure on up-stream side and ten time the span of such bridge structure on down-stream side, subject to a minimum of 250 meters on the up-stream side and 500 meters on the down-stream side;

ii. There shall be maintained an un-mined block of 50 meters width after every block of 1000 meters over which mining is undertaken or at such distance as may be directed by the Director or any officer authorised by him;

iii. The maximum depth of mining in the river-bed shall not exceed three meters from the un-mined bed level at any point in time with proper bench formation;

iv. Mining shall be restricted within the central 3/4th width of the river/ rivulet;

v. Any other condition(s), as may be required by the Irrigation Department of the state from time to time for river-bed mining in consultation with the Mines & Geology Department, may be made applicable to the mining operations in river-beds.

vi. No mining operation may be carried out from 1st July to 15th September every year (rainy season).

4.27 No mining operation shall be allowed in the urbanize zone of area notified by Town and Country Planning Department. Further, in case of the agriculture zone notified by Town and Country Planning Department mining shall be permissible only after obtaining prior permission from the competent authority;

4.28 The contractor shall not undertake any mining operation in the area granted on mining contract without obtaining requisite permission from the competent authority as required for undertaking mining operations under relevant laws; .

4.29 The contractor shall be under obligation to carry out mining in accordance with all other provisions as applicable under the Mines Act, 1952, Mines and Minerals (Development and Regulation) Act, 1957, Indian Explosive Act, 1884, Forest (Conservation) Act, 1980 and Environment (Protection) Act, 1986 and the rules made thereunder, Wild life (Protection) Act, 1972, Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981;

4.30 All other terms and conditions shall remain as per auction notice and the provisions of the Mines and Minerals (Development and Regulation) Act, 1957 and Rules made thereunder shall prevail over all the terms and conditions.

5. Accordingly, you are advised to submit the Draft Contract Agreement along with other requisite documents including a solvent surety(s) for a sum equal to the amount of the annual bid for execution of the agreement, within a period of 90 days from the date of issue of this bid acceptance letter and the LoI.

Deepak Kumar

Mining Engineer
for Director, Mines & Geology,
Haryana.

2610816/2023/Estt.Br

Endst. No. DMG/HY/Sultanpur Unit/Palwal/2022/ Dated

A copy is forwarded to the following for information and necessary action please:-

1. Principal Secretary to Government Haryana, Mines and Geology Department.
2. The Chairman, Haryana State Pollution Control Board, Panchkula.
3. The Deputy Commissioner, Palwal.
4. The Mining Officer, Mines & Geology Department, Faridabad. He is directed to ensure that proper and complete 'Draft Contract Agreement Documents' as required are submitted within stipulated period.

Mining Engineer
for Director, Mines & Geology,
Haryana.

APPROVED

2610816/2023/Estt.Br

CONSENT LETTER FROM APPLICANT (Annexure-ii)

The mining plan in respect of M/s M.M.Traders,through Manjeet Kumar S/o Sh.Ved Parkash,Village Manglora Quidem,Karnal,Haryana for Sultanpur Unit, over an area of 33.42 Hectares District- Palwal State –Haryana has been prepared by D.C.Yadav bearing registration no. RQP/DMG/2018/03.

We request The Director Mines and Geology, Haryana to make further correspondence regarding modification of the mining plan with the said RQP on the following address:-

D.C.Yadav RQP/DMG/HRY/2018/03.

First Floor,282 sector 11 D, DLF , Faridabad -121006 (Haryana)

We also authorize Shri D.C.Yadav to make correspondence with your office.

I hereby undertake that the mining plan in respect of the area prepared by RQP be deemed to have been made with my knowledge and consent and shall be acceptable to me and binding on me in all respects.

This is to declare that the Mining Plan & Progressive Mine Closure Plan complies all statutory Rules, Regulations, orders made by the Central or State Government, statutory organizations, court etc. have been taken into consideration and wherever any specific permission is required the lessee will approach the concerned authorities. It is also undertaken that all the measures proposed in the Progressive Mine Closure Plan will be implemented in a time bound manner as proposed.

Place:

Date: Signature of the applicant

APPROVED

Deepak Kumar
State Geologist

2610816/2023/Estt.Br

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GOVERNMENT OF HARYANA

DIRECTORATE OF MINES AND GEOLOGY, HARYANA,
30-BAYS BUILDING, SECTOR 17, CHANDIGARH.

CERTIFICATE OF RECOGNITION AS A QUALIFIED PERSON TO PREPARE MINING PLAN/SCHEME OF MINING FOR MINOR MINERAL MINES

(Under Rule 67 of Haryana Minor Mineral Concession, Stocking, Transportation of Minerals and Prevention of Illegal Mining Rules, 2012)

Shri Duli Chand Yadav S/o Shri Ramji Lal, resident of village Dhani Bania Wali, PO Nangal Chaudhary, District Mahendergarh having given satisfactory evidence of his qualifications and experience, is hereby granted recognition under Rule 67 of the Haryana Minor Mineral Concession, Stocking, Transportation of Minerals and Prevention of Illegal Mining Rules, 2012, as a "Qualified Person" to prepare Mining Plans/Scheme of Mining in respect of minor minerals mines in the State of Haryana.

2. His registration No. is DMG/HRY/RQP/2018/03.

3. This recognition shall be valid for a period of ten years ending on 26.04.2028

Place : Chandigarh
Dated : 26.04.2018

(Sanjay Goel) HAS
Director,
Mines & Geology, Haryana,
Chandigarh.

APPROVED
Deepak Kumar
State Geologist

ANNEXURES – 1.4

NOC FROM FOREST DEPARTMENT

2610816/2023/Estt.Br

प्रभागीय वन अधिकारी द्वारा स्पष्टीकरण पत्र
Clarification letter by
Concerned Divisional Forest Officer
हरियाणा सरकार / Government of Haryana

पी. एल. पी. ए. अथवा वन अथवा प्रतिबंधित भूमि से सम्बन्धित अनापत्ति प्रमाण पत्र।
NOC in respect of PLPA or Forest or Restricted lands.

नाम Name	मनजीत कुमार Manjeet Kumar
संगठन का नाम Organisation Name	M/s M. M. Traders
वर्तमान पता Current Address	Village Manglora Quidem, Karnal, Haryana-132037
भूमि स्थान Land Location	Attba,Palwal,Attba
भूमि मापन Land Measurements	23.41 (Acre)
आयत नम्बर / मुरबा नम्बर Rectangle No./ Murba No.	For Mining-9//10 Min, 11 Min, 12 Min, 13 Min, 16 Min, 17 Min, 18, 19, 20, 21 Min, 22 Min,23, 24, 25, 8//21 Min, 22 Min, 24 Min, 25 Min, 15//2 Min, 3 Min, 4 Min, 5,6 Min, 16//1, 2 Min, 9 Min, 10, 10//4 Min, 6 Min, 7 Min, 14 Min, 15, 16 Min, 17 Min, 25/2 Min, For Ancillary Area-14//1,2,3,4,5,6,7,8,9,10;

Reference No. (SRN):- XU8-D8R-RJVJ
जारी करने की तिथि / Date of Issuance: 28-09-2022
जारी करने का स्थान / Place of Issuance: Palwal
जारी करने वाला प्राधिकरण / Issuing Authority: Divisional Forest Officer

This is a Digitally Signed Certificate and does not require physical signature. The authenticity of this certificate can be verified from the verification link mentioned below:
https://164.100.137.243/eservices/mobileapi/verify/clarification/XU8D8RRJVJ

2610816/2023/Estt.Br

प्रभागीय वन अधिकारी द्वारा स्पष्टीकरण पत्र
Clarification letter by
Concerned Divisional Forest Officer
हरियाणा सरकार / Government of Haryana

हरियाणा भू-परिक्षण अधिनियम,1900 (1900 का पंजाब का अधिनियम II) अथवा वन अथवा प्रतिबंधित भूमि से संबंध मे निराक्षेप प्रमाण पत्र।
NOC in respect of Haryana Land and Preservation Act, 1900 (Punjab Act, II of 1900) or Forest or Restricted lands.

किला नम्बर Killa Number	For Mining-9//10 Min, 11 Min, 12 Min, 13 Min, 16 Min, 17 Min, 18, 19, 20, 21 Min, 22 Min,23, 24, 25, 8//21 Min, 22 Min, 24 Min, 25 Min, 15//2 Min, 3 Min, 4 Min, 5,6 Min, 16//1, 2 Min, 9 Min, 10, 10//4 Min, 6 Min, 7 Min, 14 Min, 15, 16 Min, 17 Min, 25/2 Min, For Ancillary Area-14//1,2,3,4,5,6,7,8,9,10
प्रयोजन Purpose	Sand Mining

जारी करने की तिथि / Date of Issuance: 28-09-2022
जारी करने का स्थान / Place of Issuance: Palwal
जारी करने वाला प्राधिकरण / Issuing Authority: Divisional Forest Officer

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2610816/2023/Estt.Br

प्रभागीय वन अधिकारी द्वारा स्पष्टीकरण पत्र
Clarification letter by
Concerned Divisional Forest Officer
हरियाणा सरकार / Government of Haryana

हरियाणा भू-परिक्षण अधिनियम,1900 (1900 का पंजाब का अधिनियम II) अथवा वन अथवा प्रतिबंधित भूमि से संबंध मे निराक्षेप प्रमाण पत्र।
NOC in respect of Haryana Land and Preservation Act, 1900 (Punjab Act, II of 1900) or Forest or Restricted lands.

Applicant Manjeet Kumar located at village /city Attba district Palwal made a proposal to use this land for Sand Mining. It is made clear that:

a) As per records available above said land is not part of notified Reserved Forest, Protected Forest under Indian Forest Act, 1927 or any area closed under section 4 of Punjab Land Preservation Act, 1900.

b) It is clarified that by the Notification No. S.O.8/P.A 2/1900/S. 4/2013 dated 4th January, 2013, all Revenue Estate of Palwal is notified u/s 4 of PLPA 1900 and S.O.81/PA.2/1900/S.3/2012 u/s 3 of PLPA 1900. The area is however not recorded as forest in the Government record but felling of any tree is strictly prohibited without the permission of Divisional Forest Officer, Palwal.

c) If approach is required from Protected Forest by the user agency, the clearance/ regularization under Forest Conservation Act 1980 will be required. Without prior clearance from Forest Department, the use of Forest land for approach road is strictly prohibited. M/s M/s M. M. Traders whose land is located at village/city, Attba District Palwal must obtain clearance as applicable under Forest Conservation Act 1980.

d) As per the records available with the Forest Department, Palwal the area does not fall in areas where plantations were raised by the Forest Department under Aravalli project.

e) All other statutory clearances mandated under the Environment Protection Act. 1986, as per the notification of Ministry of Environment and Forests, Government of India, dated 07-05-1992 or any other Act/ order shall be obtained as applicable by the project proponents from the concerned authorities.

f) The project proponent will not violate any Judicial Order/ direction issued by the Hon'ble Supreme Court/ High Courts.

g) It is clarified that the Hon'ble Supreme Court has issued various judgments dated 07.05.2002, 29.10.2002, 16.12.2002, 18.03.2004, 14.05.2008 etc. pertaining to Aravalli region in Haryana, which should be complied with.

h) It shall be the responsiblity of user agency/ applicant to get necessary clearances/ permissions under various Acts and Rules applicable if any, from the respective authorities/ Department.

i) This certificate is not applicable in case of Environment Department notification dated 10.03.2016 for Screening Plant, and notification dated 11.05.2016 for Stone Crusher. Investor/Applicant has to take clearance from Environment Department in case of Screening Plant and Stone Crusher .

It is subject to the following conditions:

1.Clarification Issued Subjected To Fulfill The Above Conditions.m/s M.m Traders Should Established Boundary Pillars At Outer Periphery Of Mining Area For Demarcation.

Date: 28-09-2022
Place: Palwal

Deepak Patil
(Divisional Forest Officer)

This is a Digitally Signed Certificate and does not require physical signature. The authenticity of this certificate can be verified from the verification link mentioned below:

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2610816/2023/Estt.Br

प्रभागीय वन अधिकारी द्वारा स्पष्टीकरण पत्र
Clarification letter by
Concerned Divisional Forest Officer
हरियाणा सरकार / Government of Haryana

पी. एल. पी. ए. अथवा वन अथवा प्रतिबंधित भूमि से सम्बन्धित अनापत्ति प्रमाण पत्र।
NOC in respect of PLPA or Forest or Restricted lands.

नाम Name	मनजीत कुमार Manjeet Kumar
संगठन का नाम Organisation Name	M/s M. M. Traders
वर्तमान पता Current Address	Village Manglora Quidem, Karnal Haryana-132037,
भूमि स्थान Land Location	Sultanpur,Palwal,Sultanpur
भूमि मापन Land Measurements	39.25 (Acre)
आयत नम्बर / मुरबा नम्बर Rectangle No./ Murba No.	For Mining 122/9//9 Min, 122/3//3 Min, 4, 5, 6, 7, 8 Min, 14 Min, 15, 16 Min, 122/4//10,11,12,13,16,17,18,19,20 Min, 21, 22 Min, 23 Min, 24, 25, 122/5//2, 3 Min, 4, 5, 6, 7 Min, 8, 14 Min, 15 Min, 122 Min, For Ancillary Area - 122/3//11, 12, 19, 20, 21, 22, 122/6//1, 2, 122//2, 15, 16/1, 16/2, 25;

Reference No. (SRN):- QC6-9N2-V919
जारी करने की तिथि / Date of Issuance: 28-09-2022
जारी करने का स्थान / Place of Issuance: Palwal
जारी करने वाला प्राधिकरण / Issuing Authority: Divisional Forest Officer

This is a Digitally Signed Certificate and does not require physical signature. The authenticity of this certificate can be verified from the verification link mentioned below:
https://164.100.137.243/eservices/mobileapi/verify/clarification/QC69N2V919

2610816/2023/Estt.Br

प्रभागीय वन अधिकारी द्वारा स्पष्टीकरण पत्र
Clarification letter by
Concerned Divisional Forest Officer
हरियाणा सरकार / Government of Haryana

हरियाणा भू-परिक्षण अधिनियम,1900 (1900 का पंजाब का अधिनियम II) अथवा वन अथवा प्रतिबंधित भूमि से संबंध मे निराक्षेप प्रमाण पत्र।
NOC in respect of Haryana Land and Preservation Act, 1900 (Punjab Act, II of 1900) or Forest or Restricted lands.

किला नम्बर Killa Number	For Mining 122/9//9 Min, 122/3//3 Min, 4, 5, 6, 7, 8 Min, 14 Min, 15, 16 Min, 122/4//10,11,12,13,16,17,18,19,20 Min, 21, 22 Min, 23 Min, 24, 25, 122/5//2, 3 Min, 4, 5, 6, 7 Min, 8, 14 Min, 15 Min, 122 Min, For Ancillary Area - 122/3//11, 12, 19, 20, 21, 22, 122/6//1, 2, 122//2, 15, 16/1, 16/2, 25
प्रयोजन Purpose	Sand Mining

जारी करने की तिथि / Date of Issuance: 28-09-2022
जारी करने का स्थान / Place of Issuance: Palwal
जारी करने वाला प्राधिकरण / Issuing Authority: Divisional Forest Officer

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प्रभागीय वन अधिकारी द्वारा स्पष्टीकरण पत्र
Clarification letter by
Concerned Divisional Forest Officer
हरियाणा सरकार / Government of Haryana

हरियाणा भू-परिक्षण अधिनियम,1900 (1900 का पंजाब का अधिनियम II) अथवा वन अथवा प्रतिबंधित भूमि से संबंध मे निराक्षेप प्रमाण पत्र।
NOC in respect of Haryana Land and Preservation Act, 1900 (Punjab Act, II of 1900) or Forest or Restricted lands.

Applicant Manjeet Kumar located at village /city Sultanpur district Palwal made a proposal to use this land for Sand Mining. It is made clear that:

a) As per records available above said land is not part of notified Reserved Forest, Protected Forest under Indian Forest Act, 1927 or any area closed under section 4 of Punjab Land Preservation Act, 1900.

b) It is clarified that by the Notification No. S.O.8/P.A 2/1900/S. 4/2013 dated 4th January, 2013, all Revenue Estate of Palwal is notified u/s 4 of PLPA 1900 and S.O.81/PA.2/1900/S.3/2012 u/s 3 of PLPA 1900. The area is however not recorded as forest in the Government record but felling of any tree is strictly prohibited without the permission of Divisional Forest Officer, Palwal.

c) If approach is required from Protected Forest by the user agency, the clearance/ regularization under Forest Conservation Act 1980 will be required. Without prior clearance from Forest Department, the use of Forest land for approach road is strictly prohibited. M/s M/s M. M. Traders whose land is located at village/city, Sultanpur District Palwal must obtain clearance as applicable under Forest Conservation Act 1980.

d) As per the records available with the Forest Department, Palwal the area does not fall in areas where plantations were raised by the Forest Department under Aravalli project.

e) All other statutory clearances mandated under the Environment Protection Act. 1986, as per the notification of Ministry of Environment and Forests, Government of India, dated 07-05-1992 or any other Act/ order shall be obtained as applicable by the project proponents from the concerned authorities.

f) The project proponent will not violate any Judicial Order/ direction issued by the Hon'ble Supreme Court/ High Courts.

g) It is clarified that the Hon'ble Supreme Court has issued various judgments dated 07.05.2002, 29.10.2002, 16.12.2002, 18.03.2004, 14.05.2008 etc. pertaining to Aravalli region in Haryana, which should be complied with.

h) It shall be the responsiblity of user agency/ applicant to get necessary clearances/ permissions under various Acts and Rules applicable if any, from the respective authorities/ Department.

i) This certificate is not applicable in case of Environment Department notification dated 10.03.2016 for Screening Plant, and notification dated 11.05.2016 for Stone Crusher. Investor/Applicant has to take clearance from Environment Department in case of Screening Plant and Stone Crusher .

It is subject to the following conditions:

1.Clarification Issue Subjected To Fulfill The Above Conditions. Forest Land Will Not Be Used For Entry/exit For Proposed Location. Mining Area Will Be Demarcated Physically And Pillars Will Be Erected To Clearly Separate The Area.

Date: 28-09-2022
Place: Palwal

Deepak Patil
(Divisional Forest Officer)

This is a Digitally Signed Certificate and does not require physical signature. The authenticity of this certificate can be verified from the verification link mentioned below:

https://164.100.137.243/eservices/mobileapi/verify/clarification/QC69N2V919

ANNEXURES – 1.5

TERMS OF REFERENCE ISSUED BY SEIAA, MP

2610816/2023/Estt.Br

File No.SEIAA/HR/2022/264

Goverment of India

State Level Environment Impact Assessment Authority

Haryana

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To,

M/s M/S M.M TRADERS
NEAR MANJEET FILLING STATION, MEERUT ROAD, VILLAGE MANGLORA,
Supaul-132001
Haryana

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

Sub. Terms of Reference to the Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ year production over an area of 33.42 Ha, NEAR MANJEET FILLING STATION, MEERUT ROAD, VILLAGE MANGLORA

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:

2610816/2023/Estt.Br

1. Proposal No.:	SIA/HR/MIN/405977/2022
2. Name of the Proposal:	Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ year production over an area of 33.42 Ha
3. Category of the Proposal:	Non-Coal Mining
4. Project/Activity applied for:	1(a) Mining of minerals
5. Date of submission for TOR:	10 Nov 2022

Date : 15-11-2022

Sh. Pardeep Kumar, IAS
(Member Secretary)

Office : **Bays No. 55-58, Ist Floor, Prayatan Bhawan, Sector-2, Panchkula, Haryana**
Phone No : Mobile : **9812844250**
Email id : **seiaa-21.env@hry.gov.in**

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.

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

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.

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

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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ANNEXURES – 2.1

KHASRA & JAMABANDI DETAILS

JAMABANDI DETAILS OF SULTANPUR UNIT

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गाँव : सुल्तानपुर

नकल जमाबंदी (पड़त पटवार)

हदबस्त न. : 147 जिला : पलवल तहसील : पलवल साल : 2020-2021

292
261

1 खेवट या जमाबंदी न.	2 खतौनी न	3 नाम तरफ या पत्ती	4 विवरण सहित मालिक नाम	5 विवरण सहित काश्तकार	6 कुए या सिंचाई के अन्य साधन का नाम	7 नम्बर खसरा या मुरब्बे और किले का नम्बर	8 रकबा और किस्म जमीन	9 दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	10 हिस्सा या हकीयत का पैमाना और बाछ का ढंग	11 अभियुक्ति
823 //	877	पत्ती दुलीचन्द	किरन सिंह पुत्र	खुदकाश्त		122//			कब्जा	—— लाल आरम्भ——
			बादाम पुत्र			3/4	6-11 सैलाबी		पहता बशरह खेवट	बदर न: 1
794			गौडा			7	8-0 सैलाबी		न.1	—— लाल समाप्त——
			1/5 भाग			14	8-0 सैलाबी			
			हरपाल पुत्र			17	8-0 सैलाबी			
			मुखराम पुत्र			24	8-0 सैलाबी			
			गौडा							
			3/10 भाग			किते 5	38-11			
			धनीराम पुत्र			कुल मजरूआ				
			बादाम पुत्र							
			गौडा			38-11				
			3/10 भाग							
			रोहताश,			38-11 सैलाबी				
			हरिचन्द,							
			हरपाल,							
			रिछपाल,							
			जयपाल,							
			परमाल पुत्रान व							
			सन्तोष,							
			जयपाली पुत्रिया व							
			श्रीमति भगवती विधवा							
			मुखराम पुत्र							
			गौडा							
			हर नौ समभाग							
			1/5 भाग							

नोट:- इन्त नं० 72 01/10/2020 से किरनसिंह पुत्र बादाम ने आराजी मुबलिग 105000/-रु० HDFC बैंक पलवल के भार रहन है।

PTO

नक़ल जमाबंदी (पड़त पटवार)

गाँव : सुल्तानपुर हदबस्त न. : 147 जिला : पलवल तहसील : पलवल साल : 2020-2021

खेवट या जमाबंदी न.	खतौनी न.	नाम तरक, या पत्ती	विवरण सहित नामिक नाम	विवरण सहित काश्तकार	कुएं या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या नुरम्बे और किले का नम्बर	रक्बा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाठ का ढंग	अतिरिक्त
825 // 796	879	पत्ती दुतीचन्द	वासीदेह वीरसिंह, गोरधन, महीपाल, महेन्द्र पुत्तन व श्रीमती शीला पुत्री लालू पुत्र नन्हें हर पाँच जनसाम वासी अदमा नजरा वासी कुशक	खुदकाश्त		122/3// 3 122/6// 3 8 122/3// 8 122/6// 13 122/3// 13 18 23 किते 8 कुल मजकूरा 61-2 61-2 सैलाबी	6-11 सैलाबी 8-0 सैलाबी 8-0 सैलाबी 8-0 सैलाबी 6-11 सैलाबी 8-0 सैलाबी 8-0 सैलाबी 8-0 सैलाबी 61-2	कब्जा पड़ता बखरह खेवट न.1	—— लाल आरम्भ—— बहर न: 1 —— लाल समाप्त—— रपट नं.-418-420/29-4-05 के अनुसार सालम खेवट रक्बा तादादी 61-2 का 1/5भाग बाकदर रक्बा 12-4 बदले मु. 37500/-सैंतीस हजार पाँच सौ रुपये में मिन जानिब वीरसिंह पुत्र लालू बनाम G.G.B.कुशक आड रहन है।
829 // 800	883	पत्ती दुतीचन्द	जग्गी उर्फजयन्ती, दयाचन्द, सतपाल, रामफूल, हरफूल पुत्तन	खुदकाश्त		122/7// 4 5 6 7	8-0 सैलाबी 8-0 सैलाबी 8-16 सैलाबी 6-13 सैलाबी	कब्जा पड़ता बखरह खेवट न.1	2307 विरासत रपट 285/16-1-7 से दयाचन्द पुत्र अंतराम की अराजी किला न. 122/7//4/5/6/7 122/2//7 रकबा

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नकल जमाबंदी (पड़त पटवार)

गाँव : सुल्तानपुर हदबस्त न. : 147 जिला : पलवल तहसील : पलवल साल : 2020-2021

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
			अन्तराम पुत्र धूरे हर पाँच समभाग वासी भवाना मजारा वासी कुशक			122/2// 7 14 16/2 17 24 25 ---------- किते 10 कुल मजरुआ ---------- 78-14 ---------- 78-14 सैलाबी	7-15 सैलाबी 8-0 सैलाबी 7-10 सैलाबी 8-0 सैलाबी 8-0 सैलाबी 8-0 सैलाबी ---------- 78-14			39-14 का 1/5 आग बदले मु. 100000/- में बनाम PLDB होडल को आड रहन है। रपट न. 406/4-6-9 से मिन जानिब दयाचन्द पुत्र अंतराम की अराजी किला न. 122/2//7/14/17/24 16/2/ 25 रकबा 47-5 में से 8-0 बनाम The Fbd Co.op Bank बडौनी बदले मु. 100000/- में आड रहन है। रपट न. 506/14-11-11 से सालम खेवट न. 78-14 में से 15-15 मिन जानिब रामफूल पुत्र अंतराम बनाम GGB कुशक बदले मु. 200000/- में आड रहन है। रपट न. 173/16-12-11 से अराजी किला न. 122/2//14 16/2 17 24 25 रकबा 39-10 में से 7-17 जयन्ती पुत्र अंतराम बनाम PLDB होडल बदले मु. 320000/- में आड रहन है। रपट न. 293/3-2-20 से

829 चातू पत्ती चातू

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नक़ल जमाबंदी (पड़त पटवार)

गाँव : सुल्तानपुर   हदबस्त न. : 147   जिला : पलवल   तहसील : पलवल   साल : 2020-2021

295
261

खेवट या जमाबंदी न.	खतौनी. न.	नाम तरफ या पत्ती.	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुएं या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और. किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या . हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
										सालम खेवट 78-14 में से 15-14 मालिक सतपाल पुत्र अंतराम बनाम केनरा बैंक गुलाबद बदले मु. 314000/- में आड रहन है। —— लाल आरम्भ—— बदर न: 1 —— लाल समाप्त——
830 // 801	884	पत्ती दुलीचन्द	अमीचन्द पुत्र धूरे पुत्र जीवन बासी मवाना मजरा वासी मुशक	खुदकाश्त		122/3// 1 122/6// 1 122/2// 6 122/6// 10 122/3// 10 11 122/6// 11 122/2// 15 16/1 122/3// 20 21	3-4 सैलाबी 8-0 सैलाबी 9-7 सैलाबी 8-0 सैलाबी 8-0 सैलाबी 8-0 सैलाबी 2-19 सैलाबी 8-0 सैलाबी 0-10 सैलाबी 8-0 सैलाबी 8-0 सैलाबी		कब्जा पड़ता बशरह खेवट न.1	रपट न. 208/13-2-15 से सालम खेवट 72-0 मिन जानिब अमीचन्द पुत्र धूरे बनाम OBC दीघोट बदले मु. 950000/- में आड रहन है। —— लाल आरम्भ—— बदर न: 1 —— लाल समाप्त——

नोट:- रपट नं० 208 / 13/2/15 ... नं० 794 / 09/5/2022 से फक हैं।

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नकल जमाबंदी (पड़त पटवार)

गाँव : सुल्तानपुर | हदबस्त न. : 147 | जिला : पलवल | तहसील : पलवल | साल : 2020-2021

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
						किले 11	72-0			
						कुल मजरूआ				
						72-0				
						72-0 सैलाबी				
831 //	885	पत्ती दुलीचन्द	धनशेरसिंह,	खुदकाश्त		122/3//			कब्जा	—— लाल आरम्भ——
			प्रकाश सिंह पुत्रान व			2	5-1 सैलाबी		पड़ता बजरह	बदर न: 1
832			श्रीमती मुड्डी पुत्री			122/6//			खेवट	
			व			2	8-0 सैलाबी		न.1	—— लाल समाप्त——
			श्रीमती बुंदेई विधवा			9	8-0 सैलाबी			2773 विरासत
			शिवचरण पुत्र			122/3//				
			बलवन्ता			9	8-0 सैलाबी			
			हर चार समभाग			122/6//				
			1/2 भाग			12	4-16 सैलाबी			
			वासीदेह			122/3//				
			श्रीमती बुंदेई पत्नी			12	8-0 सैलाबी			
			शिवचरन पुत्र			19	8-0 सैलाबी			
			बलवत			22	8-0 सैलाबी			
			1/2 भाग							
			वासी रायदासका			किले 8	57-17			
						कुल मजरूआ				
						57-17				
						57-17 सैलाबी				

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नकल जमाबंदी (पट्टा पटवार)

गांव : सुल्तानपुर | हदबस्त नं : 147 | जिला : पलवल | तहसील : पलवल | साल : 2020-2021

1	2	3	4	5	6	7	8	9	10	11
खेवट या जमाबंदी नं.	खतौनी नं.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित कब्जाकार	कुए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुआफ होता है	हिस्सा या हकीयत का पैमाना और बांट का ढंग	अभियुक्ति
832	886	पत्ती दुतीचन्द	धनीराम उर्फधन्नी,	खुदकाश्त		122/5//			कब्जा	रपट नं. 334/13-5-14 से
//			नेपाल,			1	8-0 सैलाबी		पड़ता बशरह खेवट	सालम खेवट 277-8 मे से
803			करन सिंह पुत्रान			2	8-0 सैलाबी		नं.1	46-4 धनीराम पुत्र बद्दाम
			बद्दाम पुत्र			3	8-0 सैलाबी			सिंह बनाम GGB कुशक
			गैन्दो			4	8-0 सैलाबी			बदले मु. 660000/- में
			हर तीन समभाग			122/6//				आड़ रहन है।
			1/2 भाग			5	8-0 सैलाबी			रपट नं. 235/25-2-16 से
			वासीदेह			122/3//				सालम खेवट 277-8 मे से
			हरपाल,			5	2-3 सैलाबी			46-4 नैपाल पुत्र बद्दाम
			रिछपाल,			6	8-0 सैलाबी			सिंह बनाम SHGB कुशक
			जयपाल,			122/6//				बदले मु. 745000/- में
			हरिया,			6	8-0 सैलाबी			आड़ रहन है।
			रोहताश पुत्रान			122/5//				— लाल आरम्भ—
			मुखराम पुत्र			7	8-0 सैलाबी			बहर नः 1
			गैन्डे			8	8-0 सैलाबी			— लाल समाप्त—
			हर पाँच समभाग			9	8-0 सैलाबी			
			5/12 भाग			122/4//				
			वासी मांगर त.ब			10	5-7 सैलाबी			
			जिला फरीदाबाद			122/5//				
			परमाल पुत्र			10	8-0 सैलाबी			
			मुखराम पुत्र			11	8-0 सैलाबी			
			गैन्डे			122/4//				
			1/12 भाग			11	8-0 सैलाबी			
			वासीदेह			12	8-13 सैलाबी			
						122/5//				

नोट:— रपट नं० 72 दि० 1-10-2020 खे० नं० 823 पर है।

P.T.O.

0172022000030673

नक़ल जमाबंदी (पहत पटवार)

गाँव : सुल्तानपुर | हदबस्त न. : 147 | जिला पलवल | तहसील पलवल | साल : 2020-2021

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म ज़मीन	दर और तादाद के ब्यौरे के साथ लगान जो मुज़ारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
						12	8-0 सैलाबी			
						13	8-0 सैलाबी			
						122/4// 13	8-0 सैलाबी			
						122/5// 14	8-0 सैलाबी			
832चाहू		पत्ती चाहू				122/6// 15	7-10 सैलाबी			
						122/3// 15	8-0 सैलाबी			
						16	8-0 सैलाबी			
						122/5// 17	10-17 सैलाबी			
						122/4// 17	7-14 सैलाबी			
						18	8-0 सैलाबी			
						122/5// 18	8-11 सैलाबी			
						19	8-8 सैलाबी			
						122/4// 19	8-0 सैलाबी			
						20	8-0 सैलाबी			
						122/5// 20	4-5 सैलाबी			
						122/4// 21	8-0 सैलाबी			
						22	8-0 सैलाबी			
						23	8-0 सैलाबी			
						24	8-0 सैलाबी			

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नकल जमाबंदी (पड़त पटवार)

गांव : सुल्तानपुर | हदबस्त न. : 147 | जिला : पलवल | तहसील : पलवल | साल : 2020-2021

खेवट या जमाबंदी न.	खतौनी न	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और सख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
						122/3// 25	8-0 सैलाबी			
						किते 36 कुल मजरुआ	277-8			
						277-8				
						277-8 सैलाबी				
832चालू 875 //	931	पत्ती चालू पत्ती दुलीचन्द	पंचायत देह वासीदेह	मुद्दकाश्त व मकबूजा		30// 26	0-8 गै. मु.		कब्जा पड़ता बशरह खेवट न.1	—— लाल आरम्भ—— 1999 पारिवारिक हस्तांतरण खारिज ——लाल समाप्त——
846				पंचायत देह						
						122// 4/16	2-18 सैलाबी			—— लाल आरम्भ—— 2000 पारिवारिक हस्तांतरण खारिज ——लाल समाप्त——
						122/5// 5	6-0 सैलाबी			
						6	4-13 सैलाबी			
						15	4-19 सैलाबी			—— लाल आरम्भ—— 2001 है खारिज ——लाल समाप्त——
						122// 25	7-7 सैलाबी			
						122 मिन	881-18 गै. मु.			—— लाल आरम्भ—— 2002 है खारिज ——लाल समाप्त——
						122/9	106-17 गै. मु. दरिया			
						143	0-5 गै. मु. गैर			
						253	0-5 गै. मु.			

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नकल जमाबंदी (पड़त पटवार)

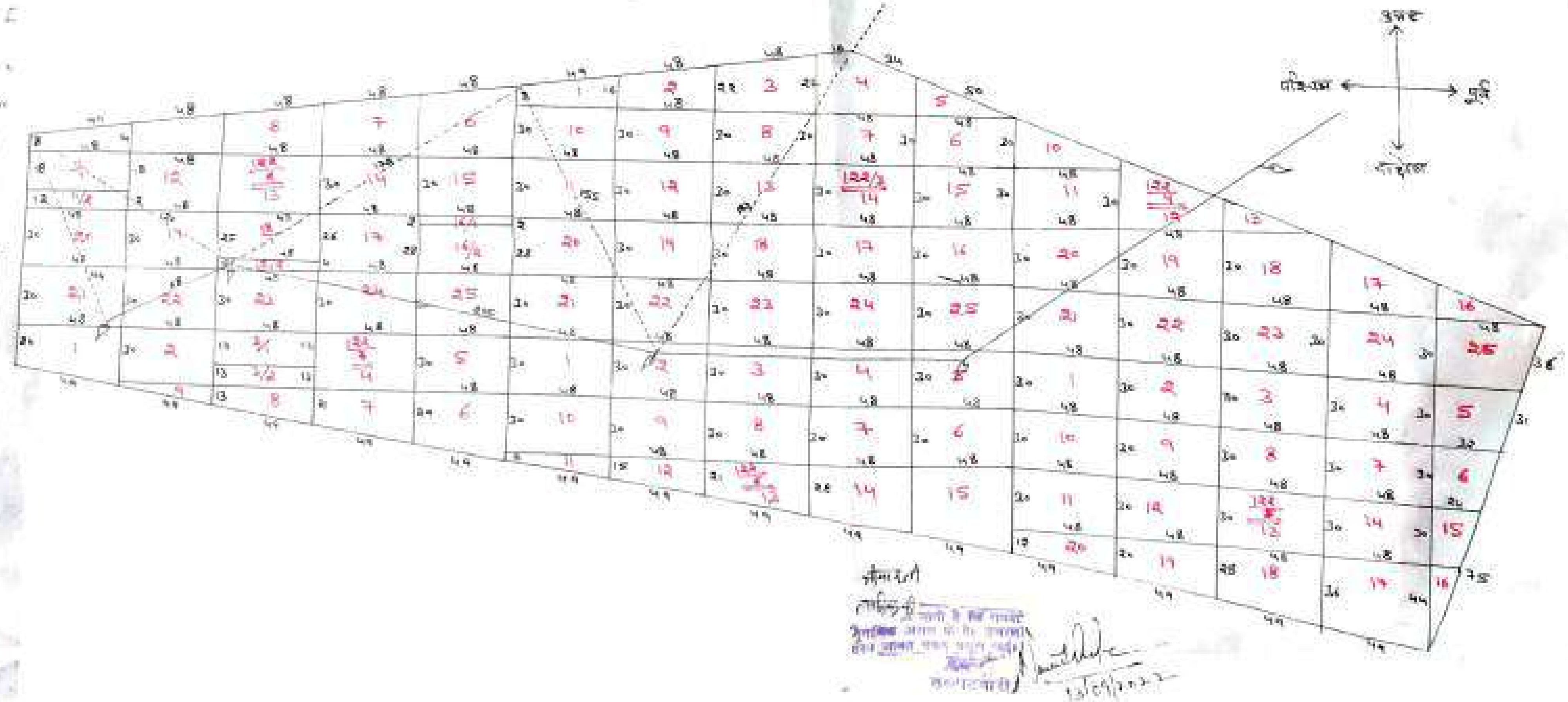
गांव : सुल्तानपुर | हदबस्त न. : 147 | जिला : पलवल | तहसील : पलवल | साल : 2020-2021

खेवट या जमाबंदी नं.	खतौनी नं.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
							गढा खाद			
						289	0-1 गै. मु. गढा खाद			
						322/1	0-2 गै. मु. गढा खाद			
						322/2	0-2 गै. मु. गढा खाद			
						323	0-2 गै. मु. गढा खाद			
						346	0-1 गै. मु. गढा खाद			
						347	0-1 गै. मु. गढा खाद			
875चालू		पत्ती चालू				किते 16 सालम 15 मिन 1	1015-13			
						कुल मजरूआ	कुल गैर मजरूआ			
						25-17	989-16			
						25-17 सैलाबी	989-16 गै.मु.			
	932			खुदकाश्त जगन पुत्र हरकेश पुत्र बदले 1/3 भाग हिस्सेदार		122/2// 8	6-3 सैलाबी			
						13	8-0 सैलाबी			
						18/1	6-16 सैलाबी			
						किते 3	20-19			

06/09/2022

KHASRA/ SIJRA NAKSHA OF SULTANPUR UNIT

नकल अक्स शिजरा - मौजा - सुल्तानपुर, हद बस्त नं- 57, तहसील - पलवल, जिला - पलवल
साल - 1964-1965, इकाई = 30×48 कर्म, 1 इंच = 40 कर्म



JAMABANDI DETAILS OF ATWA UNIT

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गाँव : अलवा

नकल जमाबंदी (पड़त पटवार)

304
261

हदबस्त न. : 109 | जिला : पलवल | तहसील : पलवल | साल : 2016-2017

1 खेवट या जमाबंदी न.	2 खतौनी न.	3 नाम तरफ या पत्ती	4 विवरण सहित मालिक नाम	5 विवरण सहित काश्तकार	6 कुंए या सिंचाई के अन्य साधन का नाम	7 नम्बर खसरा या मुरब्बे और किले का नम्बर	8 रकबा और किस्म जमीन	9 दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	10 हिस्सा या हकीयत का पैमाना और बाछ का ढंग	11 अभियुक्ति
179 मिन // 176	204		शामलात देह हस्ब रसद विस्वात वासीदेह	श्रीमती जयन्ती विधवा टेकचन्द, रामानन्द पुत्रान व श्रीमती गायत्री देवी पुत्री खेमचन्द उर्फ शंकर पुत्र नत्थी हर चार समभाग 1633/43536 भाग हिस्सेदारान धर्मवीर पुत्र श्रीमती ओमा पुत्री देवीराम पुत्र हर दो समभाग 609/43538 भाग, हिस्सेदारान जीवन लाल पुत्र दुन्डा पुत्र भीमा 3285/43538 भाग हिस्सेदार वीरनारायण पुत्र किशोर पुत्र गंगादास		8// 1/1 9/2 10 11 12 मिन 13 मिन 18 मिन 19 20 21 22 23/1 ------ किले 12 सालम 9 मिन 3 कुल मजरूआ ------ 78-3 ------ 2-0 चाही 78-3 बंजर	2-19 बंजर 2-0 चाही 7-15 बंजर 8-0 बंजर 7-13 बंजर 7-5 बंजर 4-13 बंजर 8-0 बंजर 8-0 बंजर 8-0 बंजर 8-0 बंजर 5-18 बंजर ------ 78-3		कब्जा पड़ता बशरह खेवट न.1	920 बैय 920 बैय 1009 विरासत —— लाल आरम्भ—— बदर न: 553 —— लाल समाप्त——

Note रपट नं० 92 दिनांक 12-1-22 के अनुसार इलाहाबाद हाईकोर्ट के आदेशानुसार खरीद बेच पर रोक है खेवट नं० 179 पर।

Note रपट नं० 486/22-5-2018 के तहत दखल कार्यवाही रहन रोजनामचा दिलाकर दर्ज कर दी है।

श्रीमान जी नकल मुताबिक असल है नकल ... पटवारी

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नकल जमाबंदी (पड़त पटवार)

गाँव : अलवा

हदबस्त न. : 109 | जिला : पलवल | तहसील : पलवल | साल : 2016-2017

खेवट या जमाबंदी न.	खतौनी न.	नाम.तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
179चालू	चालू			1467/43536 भाग हिस्सेदार गयालाल, दयाचन्द पुत्रान वीरनारायण पुत्र किशोर हर दो समभाग 734/43536 भाग हिस्सेदारान प्रेमचन्द, प्रकाशचन्द, राजेश, मूदेव पुत्रान खेमचन्द पुत्र हर चार समभाग 1633/43536 भाग हिस्सेदारान श्रीमती सोमदेई.विधवा किशनचन्द, प्रेमचन्द पुत्रान व कौशल, हमली पुत्रियां देवीराम पुत्र मोहन हर पाँच समभाग 1749/43536 भाग हिस्सेदारान						

Nok रपट नं० - 32 दिनांक 12-10-2012 के आदेशानुसार किला नं०

3
2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25

मु० 4 का किला नं० । मैं 2 व 7 से 25 तक लगातार, मुस्तील 5//21 व मुस्तील 6//1-10-11-12-19-20 व मुस्तील 8 का कीला नं० । से 25 तक लगातार व मुस्तील 17 का । से 25 तक लगातार व 18 का 1-2-9 10-11-12-13-19-20-21-22 व 19//1-2-9-10-11-12-19-20-21-22 व मुस्तील 20 कीला नं० । से 25 तक लगातार व 32 का । से 25 तक लगातार व मु० 33 का 1-2-9-10-11-12-19-20-21-22 व मुस्तील 34 का । से 25 तक लगातार व मुस्तील 35 का । से 25 तक लगातार व मुस्तील 47/3-4-5-6-15-16 व मुस्तील 48 का । से 25 तक लगातार व मु० 49 का कीला नं० -1-2-3-9-10-11 व मुस्तील 50 के कीला नं० 2-3 / 176 कुल रकबा 27-24-15 (A-K-M) की बाबत हाई कोर्ट इलाहाबाद में रजीट केस पर रोक लगी है।

Generated vide Entry/Receipt No. 017202200030665 Dated 06-09-2022 00:00:00 Issued to : alwa
Generated by manishakpwl from Web-Halris
Report Generation Date : 06/09/2022 12:43 PM
Nakal Fees Total Charges: 140 Rupees Only (Fee 50 + Computer Service Charges 90)

P.T.O.

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गाँव : अतवा

नकल जमाबंदी (पड़त पटवार)

हदबस्त न. : 109 | जिला : पलवल | तहसील : पलवल | साल : 2016-2017

खेवट या जमाबंदी न.	खतौनी. न.	नाम तरफ या पत्ती.	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
179चाल्		चाल्		श्रीमती अशरफी विधवा रामवती, भगवती, सावत्री, कान्ता पुत्रियां चन्द्रभान पुत्र दुन्हा हर पाँच समभाग 3265/43536 भाग हिस्सेदारान शिवचरन पुत्र गिरधारी पुत्र कल्लन 1360/43536 भाग हिस्सेदार नारायण, गोविन्दराम, भजन लाल, चुन्नीलाल पुत्रान लालाराम पुत्र मुकन्दा हर चार समभाग 272/43536 भाग हिस्सेदारान बायान जगमोहन पुत्र व फूलसिंह						

Generated vide Entry/Receipt No: 017202200030665 Dated 06-09-2022 00:00:00 Issued to : atwa
Generated by: mahendrpal from Web-Halris
Report Generation Date : 06/09/2022 12:43 PM
Nakal Fees Total Charges: 140 Rupees Only (Fee: 50 + Computer Service Charges 90)

P.T.O

Digital India
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नकल जमाबंदी (पइत पटवार)

गाँव : अतवा हदबस्त न. : 109 जिला : पलवल तहसील : पलवल साल : 2016-2017

खेवट का जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो गुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभिपुष्टित
179धातू	धातू	221	हर दो समभाग 50/907 भाग मुशत्रीयान मै.अलसून प्रोमोटरस ऐन्ड डवलपरस प्रा.लि.बजरिये डायरेक्टर देशराज पुत्र व परमानन्द व मुकेश पुत्र देशराज दिल्ली का विनयकुमार हर दो समभाग 4559/14512 भाग बासीदेह मुशत्रीयान व मकबूजा मालक 9153/14512 भाग शिवनारायण, गौरनारायण पुत्रान किशोर पुत्र हर दो समभाग 1577/6487 भाग पट्टा मरिन्दगान श्रीमती शोभादेई विधवा व किशनचन्द,	2//	15 मिन 20 मिन 21 मिन 22 मिन 23 मिन 24 मिन	0-15 सैलाबी 0-3 बंजर 7-17 बंजर 5-8 बंजर 2-11 बंजर 0-11 बंजर	9//		

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नकल जमाबंदी (पड़त पटवार)

गाँव : अतवा हदबस्त न. : 109 जिला : पलवल तहसील : पलवल साल : 2016-2017

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संकमा के स्यारे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अतिरिक्त
				धर्मवीर,		16	8-0 बंजर			
				प्रेमचन्द पुत्रान व		17	8-0 बंजर			
				कौशल,		22	8-0 बंजर			
				ओमा,		23	8-0 बंजर			
				हमली पुत्रियां		24	8-0 बंजर			
				देवीराम पुत्र		25	8-0 बंजर			
				हर सात समभाग		10//				
				692/6487 भाग		17	8-0 बंजर			
				पड़ा गरिन्दगान		22 मिन	1-12 बंजर			
				अमरसिंह,		23	8-0 बंजर			
				देवीराम,		24	8-0 बंजर			
				मनीराम पुत्रान		25/1	4-0 बंजर			
				शादी पुत्र		14//				
				हर तीन समभाग		13	8-0 चाही			
				137/6487 भाग		15//				
				पड़ा गरिन्दगान		1/2	4-0 चाही			
				शादी पुत्र		5	8-0 चाही			
				रामफल पुत्र		22 मिन	0-16 चाही			
179चान्		चान्		1/19461 भाग		16//				
				पड़ा गरिन्दा		10/2	3-3 चाही			
				नारायण,		22//				
				गोविन्दराम,		3/1	7-4 चाही			
				भजन लाल,		4 मिन	0-16 चाही			
				पुन्नीलाल पुत्रान		6	8-0 चाही			
				नानाराम पुत्र		7	8-0 चाही			
				हर चार समभाग		8/1	0-16 चाही			
				166/6487 भाग		9/2	0-16 चाही			

P.T.O

017202200030865

नकल जमाबंदी (पड़त पटवार)

गाँव : अतवा

हदबस्त न. : 109 जिला : पलवल तहसील : पलवल साल : 2016-2017

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुएं या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्योरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
				पट्टा गरिन्दगान		10/1	0-16 चाही			
				सरदाराम पुत्र		23//				
				चन्दन पुत्र		3/1	0-16 चाही			
				139/8487 भाग		6/1	0-16 चाही			
				पट्टा गरिन्दा		7/3	0-16 चाही			
				श्रीमती जयन्ती विधवा व						
				श्रीमती गायत्री पुत्री		किले 32	147-13			
				व						
				प्रेमचन्द,		सालम 23				
				प्रकाश,		मिन 9				
				राजेश,		कुल मजरूआ				
				भूदेव,						
				रामानन्द,		147-13				
				टेकचन्द पुत्रान						
				खैमचन्द उर्फ शंकर		32-15 चाही				
				पुत्र		20-0 चाही				
				हर आठ समभाग		0-15 नैलाबी				
				1984/8487 भाग		94-3 बंजर				
				पट्टा गरिन्दगान						
				चरन सिंह उर्फ चुन्नु,						
				लायकराम उर्फ लिक्खी,						
179वाहु	चालू			रमेश पुत्रान						
				ओमप्रकाश पुत्र						
				हर तीन समभाग						
				992/8487 भाग						
				पट्टा गरिन्दगान						
				उमराव,						

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Report Generation Date: 06/09/2022 12:43 PM
Nakal Fees/Total Charges: 140 Rupees Only (Fee: 50 + Computer Service Charges 90)

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01720220030665

नकल जमाबंदी (पड़त पटवार)

गाँव : अलवा

हदबस्त न. : 109 जिला : पलवल तहसील : पलवल साल : 2016-2017

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति.
				चितरन पुत्रान सुमरथ पुत्र हर दो समभाग 1326/97305 भाग पट्टा गरिन्दगान रजनी पिसर व श्रीमती रज्जो पुत्री अशरफ पुत्र हर दो समभाग 663/58383 भाग पट्टा गरिन्दगान पदम, चेली, सजान, मदन पुत्रान व श्रीमती बलदेई पुत्री अशरफ पुत्र हर पाँच समभाग 663/116766 भाग पट्टा गरिन्दगान राजपाल, गांधी पुत्रान भरता पुत्र हर दो समभाग 663/58383 भाग पट्टा गरिन्दगान						
179वातू		वातू		श्रीमती सोमोती विधवा व						

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Generated vide Entry/Receipt No. 01720220030665 Dated 06-09-2022 00:00:00 Issued To : अलवा
Generated by: manishdepat from Web-Halris
Report Generation Date 06/09/2022 12:43 PM
Nakal Fees Total Charges: 140 Rupees Only (Fee: 50 + Computer Service Charges 90)

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नक़ल जमाबंदी (पड़त पटवार)

गाँव : अतवा हदबस्त न. : 109 जिला : पलवल तहसील : पलवल साल : 2016-2017

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुएं या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या, गुरम्बे और किले का नम्बर	रक्बा और किस्म जमीन	दर और संख्या के, ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाध का ढंग	अभियुक्ति
				इन्द्र, तीरो पुत्रियां व रामनारायण, कर्मवीर पुत्रान लोहरे पुत्र हर पाँच समभाग 663/116766 भाग पड़ा गरिन्दगान हरस्वरूप पुत्र मट्टू पुत्र 4641/622752 भाग पड़ा गरिन्दा चन्दन पुत्र झम्बन पुत्र 663/415168 भाग पड़ा गरिन्दा हरस्वरूप पुत्र श्रीमती बुद्धी पुत्र 4641/1245504 भाग पड़ा गरिन्दा श्रीमती बन्तो पुत्री भुलिया पुत्र 663/622752 भाग पड़ा गरिन्दा धर्मवीर, श्यामवीर पुत्रान भुलिया पुत्र					

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[illegible]

नकल जमाबंदी (पहल पटवार)

हदबस्त नं. 106   ज़िला [illegible]   तहसील [illegible]   साल 2016-2017

खेवट या जमाबंदी नं.	खतौनी नं.	[illegible]	विवरण सहित मालिक नाम	विवरण सहित काश्तकार नाम	कुएं या सिंचाई के साधन का नाम	[illegible]	रकबा और किस्म जमीन	दर और मिकदार के लगान जो मुजारा देता है	[illegible]	अभियुक्ति
179[illegible]	[illegible]			[illegible] 8858/22752 भाग [illegible] [illegible] पुत्री [illegible] पुत्र 8853/22752 भाग [illegible] [illegible] [illegible] पुत्र [illegible] पुत्र [illegible] 8853/25848 भाग [illegible] — पुत्र —— पुत्र — 2557/78848 भाग [illegible] [illegible] पुत्र [illegible] क. 11 से 17 [illegible] 1987 से 2027 तक [illegible] [illegible] [illegible] पुत्र [illegible] पुत्र 127/6487 भाग						

[illegible]

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नक़ल जमाबंदी (पड़त पटवार)

गाँव : अतवा

हदबस्त न. : 109 | जिला : पलवल | तहसील : पलवल | साल : 2016-2017

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
				वासीदेह						
	222			पट्टा गरिन्दा						
				किंगराम,		1//				
				रतन लाल पुत्रान						817 बैय
				विजयराम पुत्र		16 मिन	1-17 बंजर			840 बैय हकूक पट्टा
				हर दो समभाग		17 मिन	4-0 बंजर			
				590/3990 भाग		18/1 मिन	3-6 बंजर			
179चालू		चालू		हिस्सेदारान		18/2	2-8 बंजर			
				जीवन लाल पुत्र		1//				
				हरीचन्द पुत्र		22				
				430/3990 भाग		22	6-9 बंजर			
				हिस्सेदार		23	8-0 बंजर			
				गनेशीलाल पुत्र		16//				
						1	8-0 चाही			
				नत्थू पुत्र		2	8-0 चाही			
				ठाकरिया		3 मिन	5-17 चाही			
				430/3990 भाग		8 मिन	4-9 चाही			
				हिस्सेदार		9	8-0 चाही			
				जीवन लाल पुत्र		10/1	4-17 चाही			
				टुन्डा पुत्र		11	8-0 चाही			
				1690/3990 भाग		12	8-0 चाही			
				हिस्सेदार		13 मिन	2-3 चाही			
				रामचन्द,		18 मिन	0-6 चाही			
				गुलाब सिंह,		19 मिन	7-18 चाही			
				शिवचरण,						
				बेदराम,		किते 17	91-10			
				शैनचन्द पुत्रान		सालम 9				
				गैंदा पुत्र		मिन 8				

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Generated by: [illegible] from Web-Halris
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Nakal Fee/Total Charges: 140 Rupees Only (Fee: 50 + Computer Service Charges 90)

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नकल जमाबंदी (पड़त पटवार)

गाँव : अतवा

हदबस्त न. : 109 जिला : पलवल तहसील : पलवल साल : 2016-2017

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
				नैतराम हर पाँच सनमान 308/3990 भाग हिस्सेदारान रामप्रशाद पुत्र रतन लाल पुत्र 154/3990 भाग हिस्सेदार जगदीश प्रशाद पुत्र रामप्रशाद पुत्र रतन लाल 154/3990 भाग हिस्सेदार रघवीर पुत्र टुन्डा पुत्र 234/3990 भाग हिस्सेदार बाया गंगाचरन पुत्र राजाराम पुत्र वासी घोघा नरेला वासी दिल्ली मुशभी जी ऐमर्पटयान ऐन्ड क.इन्जि प्रा.लि. बजरिये जी. महा चार्य वासी महरौली रोड गुडगांवा	कुल मजरुआ --- 91-10 --- 65-10 चाही 26-0 बंजर			
179चालू	चालू									

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नकल जमाबंदी (पड़त पटवार)

गाँव : अतवा हदबस्त न. : 109 जिला : पलवल तहसील : पलवल साल : 2016-2017

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मातिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के न्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
223			पड़ेदार खुदकाश्त तेजराम, गिर्राज पुत्रान श्रीराम हर दो समभाग 1536/2689 भाग हिस्सेदारान		9// 1 2 3 4 5 मिन 6 7 8 9 10 11 12 13	8-0 चाही 8-0 चाही 8-0 चाही 8-0 चाही 6-19 चाही 8-0 चाही 8-0 चाही 8-0 चाही 8-0 चाही 8-0 चाही 8-0 चाही 8-0 चाही		819 बैय 840 पड़ा बैय
179चालू	चालू		चन्द्रभान पुत्र दुन्डा व हर दो समभाग 1624/2689 भाग हिस्सेदारान बुधराम नंबीरनान व हीरालाल व		9// 14 14 15	8-0 चाही 8-0 चाही				
			हर दो समभाग 1536/2689 भाग हिस्सेदारान जलदेई, किशनदेई पुत्रियां व श्रीराम व हर तीन समभाग 512/2689 भाग हिस्सेदारान		10// 19 20 21 --- कित 18 सातम 17 मिन 1	8-0 चाही 4-19 चाही 7-9 चाही --- 139-7				

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Report Generation Date : 06/09/2022 12:43 PM
Nakal FeesTotal Charges: 140 Rupees Only (Fee: 50 + Computer Service Charges 90)

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नकल जमाबंदी (पड़त पटवार)

गाँव : अतवा हदबस्त न. : 109 जिला : पलवल तहसील : पलवल साल : 2016-2017

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
				रामवती, भगवती, सावित्रि, कान्ता पुत्रियां व चन्द्रभान व हर पाँच समभाग 1624/2689 भाग हिस्सेदारान तेजराम पुत्र रामप्रसाद पुत्र रतनलाल 88/2689 भाग हिस्सेदार श्रीमति मयुरी पुत्री सन्तराम, जसवीर पुत्रान व सुमन्तरा, ओमवती पुत्रियां व राधेलाल व हर छः समभाग 227/86048 भाग हिस्सेदारान रामसिंह पुत्र दुन्डा पुत्र सालिग	कुल मजरुआ --- 139-7 --- 139-7 चाही			
179चालू	चालू									

श्रीराम जी
सहायक भूमिलेख अधिकारी पलवल
6/09/2022

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नक़ल जमाबंदी (पड़त पटवार)

गाँव : अलवा हदबस्त न. : 109 जिला : पलवल तहसील : पलवल साल : 2016-2017

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किते का नम्बर	रक्बा और किस्म जमीन	दर और संख्या के न्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
				404/2689 भाग हिस्सेदार खैंगचन्द पुत्र पुरना पुत्र 136/2689 भाग हिस्सेदार काशीराम पुत्र कैलाशी पुत्री देवीसहाय पुत्र हर दो समभाग 33/5378 भाग हिस्सेदारान वीरवती पत्नी रामजीलाल पुत्र 1214/2689 भाग हिस्सेदार रामजीलाल पुत्र रामप्रसाद पुत्र 1214/2689 भाग हिस्सेदार धर्मवीर, रामसिंह पुत्रान व खचेडू व					
179चालू	चालू			हर तीन समभाग 227/32268 भाग हिस्सेदारान						

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Report Generation Date : 06/09/2022 12:43 PM
Nakal Fees Total Charges: 140 Rupees Only (Fee: 50 + Computer Service Charges 90)

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नकल जमाबंदी (पड़त पटवार)

गाँव : अतवा हदबस्त न. : 109 जिला : पलवल तहसील : पलवल साल : 2016-2017

खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के स्याह लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
				एमन, कंचन पुत्रान व निर्मल व हर तीन समभाग 227/16134 भाग हिस्सेदारान कन्हैया, निहालसिंह पुत्रान व कला पुत्री मूलचन्द व हर चार समभाग 661/88048 भाग हिस्सेदारान श्रीमति कमला विधवा गिर्राज, अर्जन, भीम, धर्मप्रकाश पुत्रान व रामचन्द व हर छः समभाग 227/21512 भाग हिस्सेदारान बायान श्रीमति आशा गोयल पत्नी आनन्द गोयल पुत्र					

179चालू चालू

P.T.O

017202200030865

नकल जमाबंदी (पड़त पटवार)

गाँव : अलवा हदबस्त न. : 109 जिला : पलवल तहसील : पलवल साल : 2016-2017

ठेकट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या. मुरब्बे और किले का नम्बर	रकबा और किस्म . जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अक्षियुक्ति
				नि. धोधा दिल्ली 32/1087 भाग मुशत्री एण्ड जी.एस.अटवाल इन्जिनियर प्रा0 लि0 दिल्ली मार्फत गोविन्दा महाधार्य कार्मशियल मैनेजर 1055/1087 भाग मुशत्री पट्टा दहिन्दगान जी.एस अटवाल एण्ड कम्पनी पट्टेदार अज 1-12-2005 ता 2077 व काश्त व मकबूजा 1055/1087 भाग वासीदेह पट्टा गरिन्दा					
226				रामजीलाल पुत्र रामस्वरूप पुत्र हिस्सेदार बाया श्रीमति रेशम पत्नी धनीराम पुत्र जाहरिया वासी तिघरा गुडगांवा मुशत्री	10// 16 25/2 14// 16 25 23// 5 ----------	8-0 चाही 4-0 चाही 8-0 चाही 8-0 चाही 8-0 चाही ----------		712 बैय 742 तर्क पट्टा	

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017202200030665

नकल जमाबंदी (पड़त पटवार)

गाँव : अतवा

हदबस्त न. : 109 | जिला : पलवल | तहसील : पलवल | साल : 2016-2017

320
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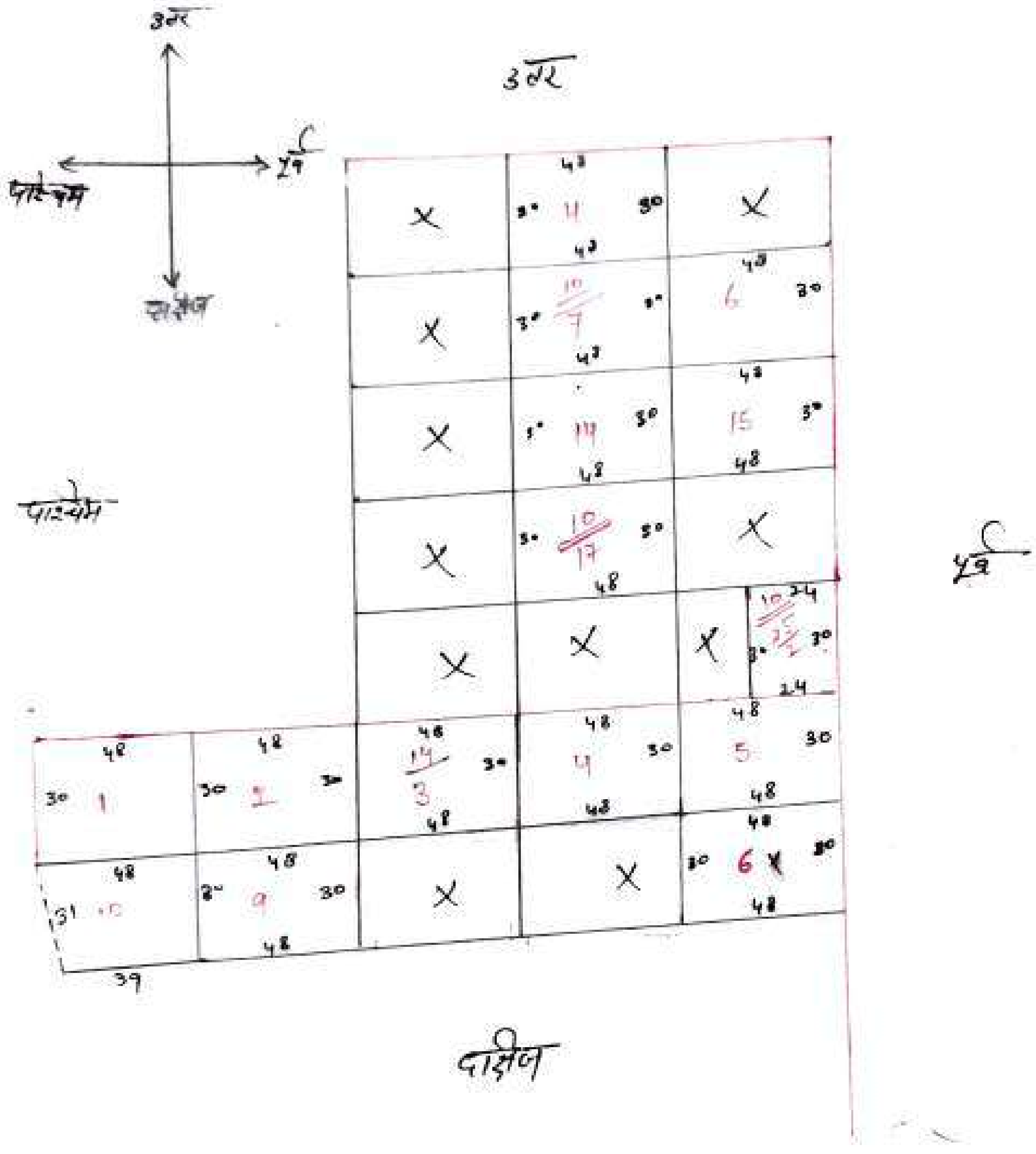
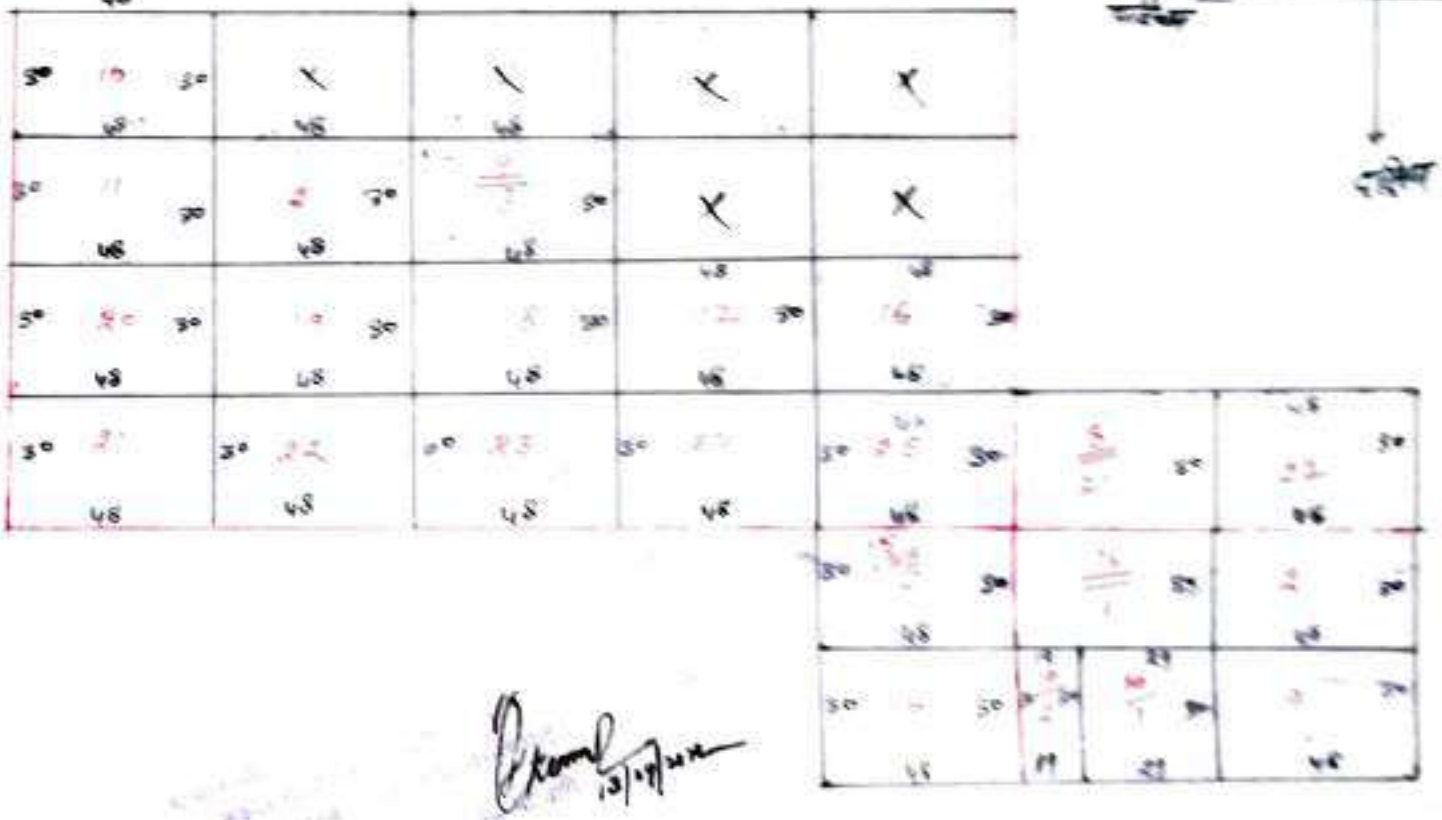
खेवट या जमाबंदी न.	खतौनी न.	नाम तरफ या पत्ती	विवरण सहित मालिक नाम	विवरण सहित काश्तकार	कुंए या सिंचाई के अन्य साधन का नाम	नम्बर खसरा या मुरब्बे और किले का नम्बर	रकबा और किस्म जमीन	दर और संख्या के ब्यौरे के साथ लगान जो मुजारा देता है	हिस्सा या हकीयत का पैमाना और बाछ का ढंग	अभियुक्ति
						किले 5 कुल मजरुआ	36-0			
179चालू	चालू					36-0				
						36-0 चाही				
			मिजान हकीयत			किले 422 सालम 385 मिन 37	2063-4			
						कुल मजरुआ 1478-9 831-14 चाही 20-0 चाही 232-10 सैलाबी 13-4 मागदा 150-18 निरमोट 230-3 बंजर	कुल गैर मजरुआ 584-15 240-8 ब.कदीम 344-7 गै.मु.			

श्रीमान जी
नकल मुताबिक असल है नकल
कुल हरफ जायदा पटवारी
6/09/2022

KHASRA/ SIJRA NAKSHA OF ATWA UNIT


उत्तर
पूर्व
पश्चिम
दक्षिण



ANNEXURES – 3.1

ON SITE (HOURLY) MICRO-METEOROLOGY DATA

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
10.1.22	1	23.2	66.2	0.4	1.4	135.0	SE	0.0	0.0
10.1.22	2	22.8	68.2	0.2	0.7	90.0	E	0.0	0.0
10.1.22	3	22.6	68.0	0.3	1.1	90.0	E	0.0	0.0
10.1.22	4	22.3	69.5	0.2	0.7	315.0	NW	0.0	0.0
10.1.22	5	22.7	66.2	0.2	0.7	315.0	NW	0.0	0.0
10.1.22	6	23.0	62.7	0.5	1.8	45.0	NE	0.0	0.0
10.1.22	7	24.7	61.0	0.5	1.8	315.0	NW	0.0	0.0
10.1.22	8	26.2	58.4	3.6	13.0	315.0	NW	0.0	0.0
10.1.22	9	27.4	56.5	0.5	1.8	315.0	NW	0.0	0.0
10.1.22	10	28.2	55.0	2.2	7.9	67.5	ENE	0.0	0.0
10.1.22	11	29.4	53.7	0.6	2.2	360.0	N	0.0	0.0
10.1.22	12	30.3	53.0	2.2	7.9	315.0	NW	0.0	0.0
10.1.22	13	30.8	53.0	2.2	7.9	315.0	NW	0.0	0.0
10.1.22	14	30.4	52.5	4.3	15.5	270.0	W	0.0	0.0
10.1.22	15	30.2	52.4	2.4	8.6	315.0	NW	0.0	0.0
10.1.22	16	29.7	53.6	4.2	15.1	360.0	N	0.0	0.0
10.1.22	17	28.4	56.8	4.7	16.9	157.5	SES	0.0	0.0
10.1.22	18	27.6	57.9	4.1	14.8	180.0	S	0.0	0.0
10.1.22	19	27.3	60.2	1.3	4.7	202.5	SSW	0.0	0.0
10.1.22	20	26.6	61.4	0.2	0.7	22.5	NNE	0.0	0.0
10.1.22	21	26.1	62.0	0.2	0.7	270.0	W	0.0	0.0
10.1.22	22	25.4	62.4	0.2	0.7	247.5	SWW	0.0	0.0
10.1.22	23	25.0	63.0	0.3	1.1	45.0	NE	0.0	0.0
10.1.22	24	24.4	64.0	0.4	1.4	292.5	WNW	0.0	0.0
10.2.22	1	24.1	64.5	0.3	1.1	225.0	SW	0.0	0.0
10.2.22	2	23.7	65.0	0.2	0.7	225.0	SW	0.0	0.0
10.2.22	3	22.9	66.0	0.2	0.7	90.0	E	0.0	0.0
10.2.22	4	22.6	66.5	0.5	1.8	315.0	NW	0.0	0.0
10.2.22	5	23.3	64.2	1.0	3.6	315.0	NW	0.0	0.0
10.2.22	6	24.6	63.1	1.0	3.6	90.0	E	0.0	0.0
10.2.22	7	25.1	62.4	0.5	1.8	135.0	SE	0.0	0.0
10.2.22	8	26.1	62.0	0.6	2.2	315.0	NW	0.0	0.0
10.2.22	9	26.6	61.0	0.9	3.2	45.0	NE	0.0	0.0
10.2.22	10	26.7	60.6	1.3	4.7	112.5	ESE	0.0	0.0
10.2.22	11	27.0	60.0	4.2	15.1	270.0	W	0.0	0.0
10.2.22	12	27.3	59.5	5.7	20.5	315.0	NW	0.0	0.0
10.2.22	13	27.7	60.0	5.4	19.4	315.0	NW	0.0	0.0
10.2.22	14	27.9	60.2	0.7	2.5	315.0	NW	0.0	0.0
10.2.22	15	28.2	62.0	2.2	7.9	315.0	NW	0.0	0.0
10.2.22	16	29.4	64.0	3.7	13.3	157.5	SES	0.0	0.0
10.2.22	17	30.1	63.5	2.2	7.9	180.0	S	0.0	0.0
10.2.22	18	29.0	65.3	2.3	8.3	180.0	S	0.0	0.0
10.2.22	19	27.8	65.3	0.5	1.8	202.5	SSW	0.0	0.0
10.2.22	20	26.6	69.0	0.3	1.1	210.0	SSW	0.0	0.0
10.2.22	21	25.4	67.3	0.1	0.4	22.5	NNE	0.0	0.0
10.2.22	22	24.3	63.5	0.2	0.7	22.5	NNE	0.0	0.0
10.2.22	23	23.2	64.0	0.2	0.7	247.5	SWW	0.0	0.0
10.2.22	24	23.1	66.0	0.4	1.4	247.5	SWW	0.0	0.0
10.3.22	1	22.9	64.0	0.3	1.1	45.0	NE	0.0	0.0
10.3.22	2	22.4	66.0	0.2	0.7	45.0	NE	0.0	0.0
10.3.22	3	22.1	68.0	0.6	2.2	45.0	NE	0.0	0.0
10.3.22	4	21.8	62.0	0.2	0.7	292.5	WNW	0.0	0.0
10.3.22	5	21.4	63.5	0.2	0.7	292.5	WNW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
10.3.22	6	23.1	65.0	0.7	2.5	135.0	SE	0.0	0.0
10.3.22	7	24.2	62.0	0.5	1.8	90.0	E	0.0	0.0
10.3.22	8	25.1	61.7	0.7	2.5	315.0	NW	0.0	0.0
10.3.22	9	25.7	58.4	1.1	4.0	315.0	NW	0.0	0.0
10.3.22	10	26.5	56.0	1.2	4.3	270.0	W	0.0	0.0
10.3.22	11	27.6	55.3	1.6	5.8	315.0	NW	0.0	0.0
10.3.22	12	28.2	55.0	2.3	8.3	90.0	E	0.0	0.0
10.3.22	13	29.4	58.4	2.4	8.6	315.0	NW	0.0	0.0
10.3.22	14	30.1	59.0	4.2	15.1	315.0	NW	0.0	0.0
10.3.22	15	31.1	60.0	3.7	13.3	157.5	SES	0.0	0.0
10.3.22	16	31.3	61.0	4.3	15.5	315.0	NW	0.0	0.0
10.3.22	17	30.4	62.0	4.5	16.2	45.0	NE	0.0	0.0
10.3.22	18	29.4	63.0	2.2	7.9	135.0	SE	0.0	0.0
10.3.22	19	28.3	63.5	2.2	7.9	112.5	ESE	0.0	0.0
10.3.22	20	27.9	64.0	0.2	0.7	180.0	S	0.0	0.0
10.3.22	21	26.5	65.0	0.5	1.8	202.5	SSW	0.0	0.0
10.3.22	22	25.1	64.0	0.4	1.4	22.5	NNE	0.0	0.0
10.3.22	23	24.2	66.5	0.2	0.7	22.5	NNE	0.0	0.0
10.3.22	24	23.8	66.0	0.4	1.4	90.0	E	0.0	0.0
10.4.22	1	23.4	65.0	0.4	1.4	315.0	NW	0.0	0.0
10.4.22	2	23.1	66.5	0.4	1.4	315.0	NW	0.0	0.0
10.4.22	3	22.7	67.0	0.5	1.8	315.0	NW	0.0	0.0
10.4.22	4	23.3	67.5	0.1	0.5	90.0	E	0.0	0.0
10.4.22	5	23.9	65.0	0.5	1.8	315.0	NW	0.0	0.0
10.4.22	6	24.7	63.0	0.6	2.2	315.0	NW	0.0	0.0
10.4.22	7	26.0	62.0	1.6	5.8	315.0	NW	0.0	0.0
10.4.22	8	26.7	61.5	1.8	6.5	225.0	SW	0.0	0.0
10.4.22	9	28.0	61.0	0.5	1.8	67.5	ENE	0.0	0.0
10.4.22	10	29.0	60.5	0.5	1.8	135.0	SE	0.0	0.0
10.4.22	11	30.1	60.0	2.3	8.3	360.0	N	0.0	0.0
10.4.22	12	30.6	59.5	3.7	13.3	225.0	SW	0.0	0.0
10.4.22	13	31.1	56.2	4.2	15.1	315.0	NW	0.0	0.0
10.4.22	14	32.1	53.0	1.2	4.3	225.0	SW	0.0	0.0
10.4.22	15	32.6	53.0	2.3	8.3	315.0	NW	0.0	0.0
10.4.22	16	33.1	52.4	2.1	7.6	315.0	NW	0.0	0.0
10.4.22	17	32.6	54.5	2.4	8.6	90.0	E	0.0	0.0
10.4.22	18	30.4	54.9	2.2	7.9	315.0	NW	0.0	0.0
10.4.22	19	29.1	57.3	0.6	2.2	180.0	S	0.0	0.0
10.4.22	20	27.8	58.2	0.6	2.2	202.5	SSW	0.0	0.0
10.4.22	21	26.4	61.0	0.3	1.1	210.0	SSW	0.0	0.0
10.4.22	22	25.4	62.0	0.4	1.4	22.5	NNE	0.0	0.0
10.4.22	23	24.7	63.0	0.3	1.1	22.5	NNE	0.0	0.0
10.4.22	24	24.1	65.0	0.2	0.7	247.5	SWW	0.0	0.0
10.5.22	1	23.8	66.0	0.2	0.7	247.5	SWW	0.0	0.0
10.5.22	2	23.7	67.5	0.5	1.8	45.0	NE	0.0	0.0
10.5.22	3	23.4	69.0	0.2	0.7	45.0	NE	0.0	0.0
10.5.22	4	23.2	70.5	0.5	1.8	292.5	WNW	0.0	0.0
10.5.22	5	23.2	71.0	0.1	0.4	315.0	NW	0.0	0.0
10.5.22	6	23.0	72.0	0.4	1.4	270.0	W	0.0	0.0
10.5.22	7	23.6	73.0	0.7	2.5	90.0	E	0.0	0.0
10.5.22	8	24.9	74.0	1.1	4.0	315.0	NW	0.0	0.0
10.5.22	9	25.7	75.0	2.0	7.2	270.0	W	2.0	0.0
10.5.22	10	26.2	76.5	0.5	1.8	270.0	W	4.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
10.5.22	11	26.9	77.0	1.4	5.0	67.5	ENE	4.0	0.0
10.5.22	12	27.6	77.5	2.3	8.3	315.0	NW	5.0	0.0
10.5.22	13	28.8	75.5	2.2	7.9	225.0	SW	5.0	0.0
10.5.22	14	29.6	73.0	4.2	15.1	315.0	NW	4.0	0.0
10.5.22	15	30.2	72.5	3.7	13.3	315.0	NW	3.0	0.0
10.5.22	16	30.7	71.0	2.2	7.9	90.0	E	2.0	0.0
10.5.22	17	31.1	69.5	6.0	21.6	270.0	W	0.0	0.0
10.5.22	18	31.4	67.5	7.2	25.9	45.0	NE	0.0	0.0
10.5.22	19	29.6	66.0	0.6	2.2	157.5	SES	0.0	0.0
10.5.22	20	28.6	65.0	0.5	1.8	180.0	S	0.0	0.0
10.5.22	21	27.3	63.5	0.4	1.4	202.5	SSW	0.0	0.0
10.5.22	22	26.3	62.0	0.2	0.7	22.5	NNE	0.0	0.0
10.5.22	23	25.3	60.5	0.4	1.4	247.5	SWW	0.0	0.0
10.5.22	24	25.2	61.0	0.2	0.7	45.0	NE	0.0	0.0
10.6.22	1	25.0	64.5	0.2	0.7	225.0	SW	0.0	0.0
10.6.22	2	24.7	67.5	0.4	1.4	225.0	SW	0.0	0.0
10.6.22	3	24.4	69.5	0.5	1.8	90.0	E	0.0	0.0
10.6.22	4	24.4	71.0	0.4	1.4	315.0	NW	0.0	0.0
10.6.22	5	24.1	73.5	0.6	2.1	315.0	NW	0.0	0.0
10.6.22	6	24.5	74.5	0.4	1.4	315.0	NW	0.0	0.0
10.6.22	7	25.6	76.0	0.8	2.8	90.0	E	2.0	0.0
10.6.22	8	27.7	77.5	2.2	7.9	90.0	E	2.0	0.0
10.6.22	9	28.9	79.0	2.5	9.0	45.0	NE	4.0	0.0
10.6.22	10	29.5	80.6	1.3	4.7	360.0	N	5.0	0.0
10.6.22	11	30.9	81.0	0.7	2.5	67.5	ENE	7.0	0.2
10.6.22	12	31.5	81.5	2.6	9.4	112.5	ESE	8.0	0.7
10.6.22	13	32.4	80.5	4.2	15.1	315.0	NW	8.0	1.4
10.6.22	14	33.6	78.6	5.7	20.5	315.0	NW	7.0	0.4
10.6.22	15	34.7	76.5	3.7	13.3	157.5	SES	6.0	0.0
10.6.22	16	35.3	73.6	2.3	8.3	180.0	S	4.0	0.0
10.6.22	17	34.1	72.5	2.2	7.9	202.5	SSW	3.0	0.0
10.6.22	18	32.1	71.5	2.1	7.6	210.0	SSW	3.0	0.0
10.6.22	19	30.3	70.6	3.7	13.3	315.0	NW	0.0	0.0
10.6.22	20	28.5	68.6	0.6	2.2	22.5	NNE	0.0	0.0
10.6.22	21	28.0	66.5	0.1	0.4	247.5	SWW	0.0	0.0
10.6.22	22	27.7	65.5	0.5	1.8	247.5	SWW	0.0	0.0
10.6.22	23	27.3	67.0	0.2	0.7	45.0	NE	0.0	0.0
10.6.22	24	27.1	68.5	0.4	1.4	45.0	NE	0.0	0.0
10.7.22	1	26.6	69.5	0.1	0.4	45.0	NE	0.0	0.0
10.7.22	2	26.3	71.5	0.2	0.7	45.0	NE	0.0	0.0
10.7.22	3	26.2	72.0	0.2	0.7	292.5	WNW	0.0	0.0
10.7.22	4	25.4	73.5	0.2	0.7	45.0	NE	4.0	0.0
10.7.22	5	23.6	74.5	0.5	1.8	225.0	SW	4.0	0.0
10.7.22	6	23.7	77.5	0.6	2.2	225.0	SW	5.0	0.0
10.7.22	7	23.4	79.4	1.2	4.2	90.0	E	6.0	0.0
10.7.22	8	23.4	80.1	1.2	4.3	90.0	E	7.0	0.3
10.7.22	9	23.7	83.5	1.1	4.0	315.0	NW	8.0	0.3
10.7.22	10	23.1	84.0	2.2	7.9	315.0	NW	8.0	0.7
10.7.22	11	23.8	85.0	2.2	7.9	270.0	W	8.0	0.4
10.7.22	12	26.8	84.4	4.4	15.8	270.0	W	8.0	0.9
10.7.22	13	28.2	82.5	3.7	13.3	315.0	NW	7.0	1.1
10.7.22	14	30.4	81.5	5.3	19.1	67.5	ENE	7.0	0.3
10.7.22	15	30.7	79.6	2.2	7.9	315.0	NW	5.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
10.7.22	16	30.2	78.5	2.2	7.9	315.0	NW	4.0	0.0
10.7.22	17	29.5	74.4	1.3	4.7	270.0	W	6.0	0.0
10.7.22	18	29.0	72.5	2.4	8.6	45.0	NE	4.0	0.0
10.7.22	19	28.9	71.5	2.1	7.6	135.0	SE	2.0	0.0
10.7.22	20	28.3	69.5	0.5	1.8	270.0	W	0.0	0.0
10.7.22	21	26.3	68.5	0.1	0.4	315.0	NW	0.0	0.0
10.7.22	22	25.8	67.0	0.5	1.8	315.0	NW	0.0	0.0
10.7.22	23	25.5	70.3	0.1	0.4	112.5	ESE	0.0	0.0
10.7.22	24	25.0	71.5	0.4	1.4	315.0	NW	0.0	0.0
10.8.22	1	24.7	72.5	0.2	0.7	157.5	SES	0.0	0.0
10.8.22	2	24.3	74.0	0.3	1.1	180.0	S	2.0	0.0
10.8.22	3	24.0	76.5	0.2	0.7	202.5	SSW	2.0	0.0
10.8.22	4	23.7	78.5	0.6	2.2	22.5	NNE	4.0	0.0
10.8.22	5	23.5	80.5	0.5	1.8	247.5	SWW	6.0	0.0
10.8.22	6	23.0	81.5	1.2	4.3	247.5	SWW	7.0	0.2
10.8.22	7	23.5	83.0	0.5	1.8	45.0	NE	8.0	0.5
10.8.22	8	24.9	84.5	1.2	4.3	45.0	NE	8.0	1.2
10.8.22	9	25.2	86.5	1.3	4.7	292.5	WNW	8.0	2.2
10.8.22	10	26.4	89.0	2.7	9.7	292.5	WNW	8.0	4.1
10.8.22	11	26.8	92.0	1.7	6.1	225.0	SW	8.0	0.5
10.8.22	12	27.2	94.0	2.2	7.9	225.0	SW	8.0	0.3
10.8.22	13	28.8	95.6	3.7	13.3	90.0	E	8.0	1.9
10.8.22	14	28.4	93.1	2.3	8.3	270.0	W	8.0	7.4
10.8.22	15	28.6	91.0	2.4	8.6	315.0	NW	8.0	0.8
10.8.22	16	28.2	88.6	2.1	7.6	90.0	E	7.0	2.2
10.8.22	17	28.0	87.0	0.6	2.2	315.0	NW	8.0	0.7
10.8.22	18	27.5	84.5	2.4	8.6	315.0	NW	8.0	0.5
10.8.22	19	27.3	89.0	0.5	1.8	225.0	SW	8.0	1.6
10.8.22	20	27.0	92.5	0.5	1.8	112.5	ESE	8.0	3.3
10.8.22	21	26.7	83.0	0.7	2.5	67.5	ENE	8.0	2.3
10.8.22	22	25.7	80.0	0.2	0.7	315.0	NW	6.0	0.6
10.8.22	23	24.8	84.5	0.3	1.1	45.0	NE	6.0	0.3
10.8.22	24	24.4	81.0	0.4	1.4	157.5	SES	6.0	0.2
10.9.22	1	24.2	79.4	0.1	0.4	180.0	S	6.0	0.0
10.9.22	2	24.0	83.0	0.4	1.4	180.0	S	6.0	0.0
10.9.22	3	23.6	87.0	0.1	0.4	202.5	SSW	7.0	1.4
10.9.22	4	23.3	88.5	0.2	0.7	22.5	NNE	8.0	3.1
10.9.22	5	23.0	91.2	0.6	2.2	247.5	SWW	8.0	5.3
10.9.22	6	23.5	93.5	0.5	1.8	247.5	SWW	8.0	1.6
10.9.22	7	24.3	90.5	1.4	4.9	45.0	NE	8.0	1.1
10.9.22	8	25.7	94.5	0.7	2.5	315.0	NW	8.0	0.7
10.9.22	9	26.0	92.0	1.4	4.9	315.0	NW	8.0	2.5
10.9.22	10	26.7	89.0	1.4	4.9	270.0	W	8.0	3.8
10.9.22	11	27.6	83.5	1.7	6.3	270.0	W	8.0	2.2
10.9.22	12	28.5	81.0	3.6	13.0	67.5	ENE	8.0	0.7
10.9.22	13	29.2	80.0	2.2	7.9	315.0	NW	8.0	0.4
10.9.22	14	30.4	77.0	2.2	7.9	315.0	NW	8.0	0.2
10.9.22	15	30.8	73.5	2.2	7.9	225.0	SW	7.0	0.4
10.9.22	16	29.4	76.5	2.3	8.3	225.0	SW	7.0	0.5
10.9.22	17	29.0	80.5	2.2	7.9	90.0	E	8.0	1.3
10.9.22	18	28.2	82.0	2.4	8.6	315.0	NW	8.0	3.2
10.9.22	19	27.7	83.0	3.7	13.3	67.5	ENE	8.0	4.6
10.9.22	20	27.0	86.5	1.2	4.2	112.5	ESE	8.0	5.1

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
10.9.22	21	26.4	88.0	0.4	1.4	157.5	SES	8.0	3.2
10.9.22	22	25.1	89.0	0.5	1.8	202.5	SSW	8.0	1.4
10.9.22	23	24.8	91.0	0.4	1.4	180.0	S	8.0	0.7
10.9.22	24	24.4	91.5	0.2	0.7	22.5	NNE	7.0	0.4
10.10.22	1	24.0	92.5	0.4	1.4	22.5	NNE	7.0	0.0
10.10.22	2	23.5	93.0	0.3	1.1	247.5	SWW	8.0	1.2
10.10.22	3	23.5	90.5	0.2	0.7	247.5	SWW	8.0	4.2
10.10.22	4	23.3	89.5	0.5	1.8	45.0	NE	8.0	2.6
10.10.22	5	23.2	88.4	0.5	1.8	45.0	NE	6.0	0.3
10.10.22	6	23.7	83.5	0.7	2.5	292.5	WNW	6.0	0.0
10.10.22	7	24.1	84.5	1.2	4.3	225.0	SW	8.0	0.0
10.10.22	8	24.8	89.0	2.3	8.4	315.0	NW	8.0	0.0
10.10.22	9	25.2	90.5	1.7	6.1	90.0	E	8.0	0.5
10.10.22	10	25.6	92.0	2.2	7.9	270.0	W	8.0	0.0
10.10.22	11	27.3	92.5	0.8	2.9	315.0	NW	8.0	1.8
10.10.22	12	28.7	93.0	2.3	8.4	67.5	ENE	8.0	1.3
10.10.22	13	29.4	94.5	2.3	8.4	315.0	NW	8.0	2.1
10.10.22	14	29.7	91.5	2.3	8.4	225.0	SW	8.0	0.3
10.10.22	15	30.0	90.5	3.3	11.9	315.0	NW	6.0	0.6
10.10.22	16	28.4	89.5	2.3	8.3	315.0	NW	6.0	0.5
10.10.22	17	28.0	88.5	2.2	7.9	315.0	NW	7.0	0.0
10.10.22	18	27.6	84.5	2.1	7.6	90.0	E	7.0	0.0
10.10.22	19	27.3	82.5	0.8	2.8	135.0	SE	8.0	0.0
10.10.22	20	26.8	81.5	0.2	0.7	67.5	ENE	8.0	0.0
10.10.22	21	26.4	80.5	0.5	1.8	112.5	ESE	8.0	0.0
10.10.22	22	26.1	79.5	0.2	0.7	157.5	SES	7.0	0.0
10.10.22	23	25.8	80.5	0.4	1.4	180.0	S	8.0	0.0
10.10.22	24	25.6	81.5	0.3	1.1	180.0	S	8.0	0.0
10.11.22	1	24.8	82.5	0.1	0.4	202.5	SSW	8.0	0.2
10.11.22	2	24.5	84.0	0.2	0.7	210.0	SSW	7.0	0.0
10.11.22	3	24.2	86.0	0.4	1.4	22.5	NNE	7.0	0.4
10.11.22	4	24.0	87.0	0.5	1.8	247.5	SWW	8.0	0.7
10.11.22	5	23.4	88.0	0.5	1.8	45.0	NE	8.0	1.2
10.11.22	6	23.7	86.0	0.6	2.2	45.0	NE	8.0	1.6
10.11.22	7	24.3	84.5	0.6	2.2	270.0	W	8.0	2.2
10.11.22	8	24.7	82.0	0.9	3.2	90.0	E	8.0	0.0
10.11.22	9	24.9	80.0	1.7	6.3	360.0	N	8.0	0.0
10.11.22	10	25.6	77.0	1.1	4.0	337.5	NWN	8.0	0.0
10.11.22	11	26.8	81.5	1.3	4.7	315.0	NW	8.0	0.0
10.11.22	12	27.3	83.0	2.3	8.3	315.0	NW	8.0	0.0
10.11.22	13	27.9	78.5	2.2	7.9	315.0	NW	8.0	0.0
10.11.22	14	27.5	80.5	2.2	7.9	67.5	ENE	7.0	0.0
10.11.22	15	27.2	82.0	2.2	7.9	315.0	NW	6.0	0.0
10.11.22	16	27.5	83.5	2.2	7.9	315.0	NW	6.0	0.0
10.11.22	17	27.0	84.0	3.8	13.7	315.0	NW	6.0	0.0
10.11.22	18	27.2	85.0	2.2	7.9	225.0	SW	6.0	0.0
10.11.22	19	26.7	81.0	2.2	7.9	315.0	NW	7.0	0.0
10.11.22	20	26.3	78.5	0.4	1.4	135.0	SE	7.0	0.0
10.11.22	21	26.0	79.0	0.2	0.7	225.0	SW	6.0	0.0
10.11.22	22	25.5	77.5	0.2	0.7	112.5	ESE	6.0	0.0
10.11.22	23	25.3	76.5	0.4	1.4	157.5	SES	5.0	0.0
10.11.22	24	25.1	79.5	0.5	1.8	180.0	S	4.0	0.0
10.12.22	1	24.7	80.5	0.2	0.7	180.0	S	4.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
10.12.22	2	24.3	82.5	0.4	1.4	202.5	SSW	5.0	0.0
10.12.22	3	23.7	84.0	0.3	1.1	210.0	SSW	7.0	0.0
10.12.22	4	23.6	86.0	0.5	1.8	22.5	NNE	8.0	0.0
10.12.22	5	23.3	89.0	0.7	2.5	22.5	NNE	8.0	0.2
10.12.22	6	23.2	93.5	0.5	1.8	247.5	SWW	8.0	1.1
10.12.22	7	23.8	92.5	0.8	2.9	247.5	SWW	8.0	2.4
10.12.22	8	24.3	91.6	2.3	8.4	67.5	ENE	8.0	0.9
10.12.22	9	24.9	90.5	2.3	8.3	135.0	SE	8.0	1.4
10.12.22	10	25.8	89.5	3.7	13.2	135.0	SE	8.0	2.7
10.12.22	11	26.7	86.5	1.3	4.7	315.0	NW	8.0	0.6
10.12.22	12	28.3	84.5	2.3	8.3	270.0	W	8.0	0.4
10.12.22	13	29.4	82.4	2.2	7.9	337.5	NWN	7.0	0.0
10.12.22	14	30.7	81.3	1.7	6.1	270.0	W	7.0	0.0
10.12.22	15	30.3	78.5	2.2	7.9	315.0	NW	8.0	0.0
10.12.22	16	30.0	80.5	2.2	7.9	315.0	NW	8.0	0.4
10.12.22	17	29.7	82.5	6.3	22.7	270.0	W	8.0	1.1
10.12.22	18	29.2	84.0	4.3	15.5	315.0	NW	8.0	1.7
10.12.22	19	28.0	86.0	1.4	5.0	225.0	SW	8.0	0.5
10.12.22	20	27.4	88.0	1.2	4.2	270.0	W	8.0	0.3
10.12.22	21	26.6	83.0	0.4	1.4	315.0	NW	8.0	0.8
10.12.22	22	26.2	81.0	0.5	1.8	135.0	SE	8.0	0.3
10.12.22	23	25.8	80.0	0.4	1.4	315.0	NW	8.0	0.0
10.12.22	24	25.0	78.0	0.2	0.7	360.0	N	8.0	0.0
13.10.22	1	23.7	81.1	0.4	1.4	157.5	SES	8.0	0.0
13.10.22	2	23.1	83.5	0.2	0.7	157.5	SES	8.0	1.5
13.10.22	3	22.8	79.5	0.4	1.4	180.0	S	8.0	0.4
13.10.22	4	22.4	78.5	0.3	1.1	180.0	S	6.0	0.0
13.10.22	5	23.3	76.5	0.5	1.8	202.5	SSW	6.0	0.0
13.10.22	6	24.4	75.5	0.5	1.8	22.5	NNE	6.0	0.5
13.10.22	7	25.2	74.5	1.2	4.2	22.5	NNE	5.0	0.0
13.10.22	8	26.6	73.5	1.1	4.0	247.5	SWW	4.0	0.0
13.10.22	9	27.0	72.0	2.2	7.9	247.5	SWW	4.0	0.0
13.10.22	10	27.5	70.5	0.8	2.9	247.5	SWW	4.0	0.0
13.10.22	11	29.1	69.5	1.4	5.0	360.0	N	4.0	0.0
13.10.22	12	29.4	68.5	2.2	7.9	270.0	W	0.0	0.0
13.10.22	13	30.3	67.5	2.3	8.3	315.0	NW	0.0	0.0
13.10.22	14	30.7	69.5	5.6	20.2	112.5	ESE	0.0	0.0
13.10.22	15	31.1	71.5	3.7	13.3	315.0	NW	0.0	0.0
13.10.22	16	31.4	72.5	2.4	8.6	315.0	NW	0.0	0.0
13.10.22	17	30.7	73.4	1.9	7.0	157.5	SES	2.0	0.0
13.10.22	18	29.2	74.5	1.9	7.0	270.0	W	2.0	0.0
13.10.22	19	28.3	76.0	3.7	13.3	270.0	W	4.0	0.0
13.10.22	20	27.1	77.4	0.5	1.8	315.0	NW	4.0	0.0
13.10.22	21	25.7	78.5	0.4	1.4	360.0	N	5.0	0.0
13.10.22	22	25.3	79.5	0.2	0.7	180.0	S	6.0	0.2
13.10.22	23	24.8	77.5	0.4	1.4	202.5	SSW	6.0	0.0
13.10.22	24	24.5	73.5	0.3	1.1	45.0	NE	0.0	0.0
14.10.22	1	24.1	71.6	0.2	0.7	45.0	NE	6.0	0.0
14.10.22	2	23.4	70.6	0.4	1.4	45.0	NE	0.0	0.0
14.10.22	3	23.7	69.6	0.4	1.4	292.5	WNW	0.0	0.0
14.10.22	4	23.3	68.0	0.5	1.8	225.0	SW	0.0	0.0
14.10.22	5	23.3	71.9	0.2	0.7	270.0	W	0.0	0.0
14.10.22	6	22.4	73.5	0.5	1.8	360.0	N	4.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
14.10.22	7	22.7	75.0	0.5	1.8	315.0	NW	3.0	0.0
14.10.22	8	22.9	76.0	1.9	6.8	315.0	NW	6.0	0.0
14.10.22	9	23.5	77.5	0.6	2.2	315.0	NW	6.0	0.0
14.10.22	10	24.0	78.5	1.4	5.0	270.0	W	7.0	0.0
14.10.22	11	25.6	81.5	1.6	5.8	270.0	W	8.0	0.6
14.10.22	12	25.8	82.5	2.2	7.9	270.0	W	8.0	0.3
14.10.22	13	26.3	83.5	2.2	7.9	67.5	ENE	8.0	1.1
14.10.22	14	26.8	84.5	2.1	7.6	315.0	NW	8.0	0.7
14.10.22	15	26.9	87.0	2.7	9.7	315.0	NW	8.0	0.0
14.10.22	16	26.6	89.0	4.2	15.1	225.0	SW	8.0	0.0
14.10.22	17	26.3	91.2	3.7	13.3	112.5	ESE	8.0	2.2
14.10.22	18	26.1	88.5	4.4	15.8	315.0	NW	8.0	1.4
14.10.22	19	26.0	84.6	5.6	20.2	360.0	N	8.0	0.2
14.10.22	20	25.7	83.5	0.6	2.2	135.0	SE	8.0	0.0
14.10.22	21	25.4	82.0	0.4	1.4	315.0	NW	7.0	0.0
14.10.22	22	25.2	80.5	0.5	1.8	67.5	ENE	6.0	0.0
14.10.22	23	25.0	79.5	0.2	0.7	112.5	ESE	5.0	0.6
14.10.22	24	24.8	78.5	0.3	1.1	360.0	N	6.0	0.0
15.10.22	1	24.2	77.5	0.2	0.7	360.0	N	5.0	0.0
15.10.22	2	23.6	75.5	0.2	0.7	157.5	SES	4.0	0.0
15.10.22	3	22.1	74.0	0.4	1.4	180.0	S	4.0	0.0
15.10.22	4	21.7	72.5	0.5	1.8	180.0	S	3.0	0.0
15.10.22	5	21.3	71.5	0.5	1.8	202.5	SSW	2.0	0.0
15.10.22	6	21.7	70.5	0.4	1.4	210.0	SSW	2.0	0.0
15.10.22	7	22.6	69.5	0.8	2.9	22.5	NNE	0.0	0.0
15.10.22	8	23.6	68.0	1.1	4.0	22.5	NNE	0.0	0.0
15.10.22	9	24.4	66.5	1.9	7.0	247.5	SWW	0.0	0.0
15.10.22	10	25.8	65.0	1.7	6.1	270.0	W	0.0	0.0
15.10.22	11	26.7	63.5	2.2	7.9	270.0	W	0.0	0.0
15.10.22	12	28.3	61.5	1.8	6.7	270.0	W	0.0	0.0
15.10.22	13	30.5	60.5	3.7	13.4	315.0	NW	0.0	0.0
15.10.22	14	30.0	59.5	2.6	9.4	315.0	NW	0.0	0.0
15.10.22	15	29.4	57.5	3.9	14.0	225.0	SW	0.0	0.0
15.10.22	16	29.0	55.8	4.2	15.1	225.0	SW	0.0	0.0
15.10.22	17	28.3	53.4	2.3	8.3	225.0	SW	0.0	0.0
15.10.22	18	28.1	54.7	0.7	2.5	337.5	NWN	0.0	0.0
15.10.22	19	27.5	55.6	1.4	5.0	315.0	NW	0.0	0.0
15.10.22	20	26.7	56.2	1.9	7.0	315.0	NW	0.0	0.0
15.10.22	21	26.3	56.8	0.5	1.8	315.0	NW	0.0	0.0
15.10.22	22	26.2	57.4	0.6	2.2	90.0	E	0.0	0.0
15.10.22	23	25.0	58.9	0.5	1.8	270.0	W	0.0	0.0
15.10.22	24	24.6	62.0	0.2	0.7	315.0	NW	0.0	0.0
16.10.22	1	24.4	64.5	0.3	1.1	315.0	NW	0.0	0.0
16.10.22	2	24.4	66.0	0.2	0.7	67.5	ENE	0.0	0.0
16.10.22	3	23.7	68.5	0.3	1.1	135.0	SE	0.0	0.0
16.10.22	4	23.3	69.0	0.4	1.4	225.0	SW	0.0	0.0
16.10.22	5	23.3	68.0	0.5	1.8	225.0	SW	0.0	0.0
16.10.22	6	23.7	66.5	0.6	2.2	135.0	SE	0.0	0.0
16.10.22	7	24.1	64.5	1.1	4.1	112.5	ESE	0.0	0.0
16.10.22	8	24.7	62.4	1.9	7.0	135.0	SE	0.0	0.0
16.10.22	9	24.9	60.2	0.5	1.8	315.0	NW	0.0	0.0
16.10.22	10	25.3	59.3	2.2	7.9	225.0	SW	0.0	0.0
16.10.22	11	26.7	58.5	2.7	9.7	157.5	SES	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
16.10.22	12	29.7	56.9	1.3	4.7	180.0	S	0.0	0.0
16.10.22	13	30.9	56.0	1.8	6.4	202.5	SSW	0.0	0.0
16.10.22	14	30.4	55.4	2.6	9.4	315.0	NW	0.0	0.0
16.10.22	15	30.0	54.7	2.2	7.9	247.5	SWW	0.0	0.0
16.10.22	16	29.5	53.0	4.3	15.5	270.0	W	0.0	0.0
16.10.22	17	29.2	53.8	4.0	14.4	315.0	NW	0.0	0.0
16.10.22	18	28.7	54.4	4.0	14.4	292.5	WNW	0.0	0.0
16.10.22	19	28.4	56.7	5.1	18.4	225.0	SW	0.0	0.0
16.10.22	20	28.3	57.8	1.1	4.0	270.0	W	0.0	0.0
16.10.22	21	27.0	58.3	0.5	1.8	225.0	SW	0.0	0.0
16.10.22	22	26.7	59.4	0.2	0.6	337.5	NWN	0.0	0.0
16.10.22	23	26.1	59.8	0.3	1.1	337.5	NWN	0.0	0.0
16.10.22	24	25.3	60.4	0.2	0.7	315.0	NW	0.0	0.0
17.10.22	1	24.4	61.5	0.2	0.7	315.0	NW	0.0	0.0
17.10.22	2	23.1	62.4	0.3	1.1	315.0	NW	0.0	0.0
17.10.22	3	22.7	62.7	0.2	0.6	315.0	NW	0.0	0.0
17.10.22	4	21.4	63.1	0.5	1.8	90.0	E	0.0	0.0
17.10.22	5	20.2	63.4	0.8	2.9	315.0	NW	0.0	0.0
17.10.22	6	20.7	62.8	0.5	1.8	270.0	W	0.0	0.0
17.10.22	7	21.3	62.3	1.1	4.0	135.0	SE	0.0	0.0
17.10.22	8	23.9	61.9	1.3	4.7	135.0	SE	0.0	0.0
17.10.22	9	25.7	61.7	1.8	6.4	270.0	W	0.0	0.0
17.10.22	10	27.5	60.2	0.5	1.8	360.0	N	0.0	0.0
17.10.22	11	28.3	59.3	1.9	6.8	315.0	NW	0.0	0.0
17.10.22	12	29.6	58.2	2.2	7.9	315.0	NW	0.0	0.0
17.10.22	13	30.5	56.3	2.2	7.9	112.5	ESE	0.0	0.0
17.10.22	14	30.0	54.3	2.5	9.0	225.0	SW	0.0	0.0
17.10.22	15	28.9	53.7	1.8	6.4	225.0	SW	0.0	0.0
17.10.22	16	28.3	52.8	2.3	8.3	135.0	SE	0.0	0.0
17.10.22	17	29.0	52.4	1.9	7.0	157.5	SES	0.0	0.0
17.10.22	18	27.3	53.5	1.9	7.0	180.0	S	0.0	0.0
17.10.22	19	26.1	54.9	1.1	4.1	180.0	S	0.0	0.0
17.10.22	20	25.0	55.6	0.5	1.8	202.5	SSW	0.0	0.0
17.10.22	21	24.2	55.9	0.8	2.9	22.5	NNE	0.0	0.0
17.10.22	22	22.7	57.4	0.4	1.4	270.0	W	0.0	0.0
17.10.22	23	22.1	58.2	0.2	0.7	247.5	SWW	0.0	0.0
17.10.22	24	21.8	59.0	0.5	1.8	45.0	NE	0.0	0.0
18.10.22	1	21.2	60.0	0.2	0.7	45.0	NE	0.0	0.0
18.10.22	2	21.2	61.0	0.1	0.4	45.0	NE	0.0	0.0
18.10.22	3	20.7	62.5	0.5	1.8	45.0	NE	0.0	0.0
18.10.22	4	20.7	61.0	0.5	1.8	292.5	WNW	0.0	0.0
18.10.22	5	20.3	63.0	0.4	1.4	292.5	WNW	0.0	0.0
18.10.22	6	20.5	63.5	0.6	2.2	292.5	WNW	0.0	0.0
18.10.22	7	20.7	65.0	1.1	4.0	225.0	SW	0.0	0.0
18.10.22	8	21.4	66.0	1.9	7.0	225.0	SW	0.0	0.0
18.10.22	9	22.5	60.6	0.7	2.5	270.0	W	0.0	0.0
18.10.22	10	23.6	58.4	1.1	4.0	337.5	NWN	0.0	0.0
18.10.22	11	25.1	57.2	1.6	5.8	337.5	NWN	0.0	0.0
18.10.22	12	27.7	55.7	2.4	8.6	315.0	NW	0.0	0.0
18.10.22	13	29.4	56.4	1.6	5.8	315.0	NW	0.0	0.0
18.10.22	14	30.6	54.7	3.7	13.3	315.0	NW	0.0	0.0
18.10.22	15	30.2	53.7	2.2	7.9	315.0	NW	0.0	0.0
18.10.22	16	30.0	53.2	2.6	9.4	315.0	NW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
18.10.22	17	29.6	52.8	3.6	13.0	315.0	NW	0.0	0.0
18.10.22	18	29.1	52.7	1.3	4.7	315.0	NW	0.0	0.0
18.10.22	19	28.5	53.2	2.1	7.6	315.0	NW	0.0	0.0
18.10.22	20	28.0	54.6	1.1	4.0	270.0	W	0.0	0.0
18.10.22	21	27.3	55.2	0.2	0.7	270.0	W	0.0	0.0
18.10.22	22	26.6	55.7	0.5	1.8	360.0	N	0.0	0.0
18.10.22	23	26.0	56.3	0.3	1.1	270.0	W	0.0	0.0
18.10.22	24	25.7	56.8	0.2	0.7	112.5	ESE	0.0	0.0
19.10.22	1	25.5	57.0	0.2	0.7	360.0	N	0.0	0.0
19.10.22	2	25.1	57.4	0.2	0.7	135.0	SE	0.0	0.0
19.10.22	3	25.0	57.9	0.5	1.8	315.0	NW	0.0	0.0
19.10.22	4	24.4	58.4	0.2	0.7	315.0	NW	0.0	0.0
19.10.22	5	22.1	59.2	0.7	2.5	135.0	SE	0.0	0.0
19.10.22	6	21.4	59.8	1.1	4.0	315.0	NW	0.0	0.0
19.10.22	7	21.8	58.7	1.7	6.1	135.0	SE	0.0	0.0
19.10.22	8	22.7	58.2	0.5	1.8	225.0	SW	0.0	0.0
19.10.22	9	23.3	56.3	2.2	7.9	45.0	NE	0.0	0.0
19.10.22	10	23.9	56.0	2.7	9.7	292.5	WNW	0.0	0.0
19.10.22	11	24.8	55.5	1.2	4.5	135.0	SE	0.0	0.0
19.10.22	12	26.5	54.9	0.6	2.0	360.0	N	0.0	0.0
19.10.22	13	29.4	54.5	3.7	13.3	315.0	NW	0.0	0.0
19.10.22	14	30.8	52.2	3.7	13.3	315.0	NW	0.0	0.0
19.10.22	15	29.7	51.7	2.2	7.9	210.0	SSW	0.0	0.0
19.10.22	16	29.0	53.9	2.2	7.9	247.5	SWW	0.0	0.0
19.10.22	17	28.4	55.0	1.7	6.0	247.5	SWW	0.0	0.0
19.10.22	18	27.8	57.2	1.2	4.3	270.0	W	0.0	0.0
19.10.22	19	27.5	58.8	2.4	8.6	45.0	NE	0.0	0.0
19.10.22	20	26.3	61.7	1.7	6.1	45.0	NE	0.0	0.0
19.10.22	21	25.3	62.8	0.2	0.7	45.0	NE	0.0	0.0
19.10.22	22	23.8	64.8	0.1	0.4	45.0	NE	0.0	0.0
19.10.22	23	22.8	68.3	0.6	2.2	292.5	WNW	0.0	0.0
19.10.22	24	21.4	68.0	0.4	1.4	292.5	WNW	0.0	0.0
20.10.22	1	21.1	68.0	0.4	1.4	337.5	NWN	0.0	0.0
20.10.22	2	20.7	69.7	0.3	1.1	337.5	NWN	0.0	0.0
20.10.22	3	19.4	70.2	0.3	1.1	315.0	NW	0.0	0.0
20.10.22	4	19.0	69.3	0.4	1.4	90.0	E	0.0	0.0
20.10.22	5	19.3	67.3	0.5	1.8	315.0	NW	0.0	0.0
20.10.22	6	19.2	63.2	0.7	2.5	67.5	ENE	0.0	0.0
20.10.22	7	19.9	61.0	1.3	4.7	135.0	SE	0.0	0.0
20.10.22	8	21.2	60.5	1.2	4.3	135.0	SE	0.0	0.0
20.10.22	9	23.7	59.4	1.9	7.0	45.0	NE	0.0	0.0
20.10.22	10	24.9	59.1	1.7	6.0	225.0	SW	0.0	0.0
20.10.22	11	26.3	58.2	1.7	6.0	225.0	SW	0.0	0.0
20.10.22	12	28.3	57.4	2.1	7.6	135.0	SE	0.0	0.0
20.10.22	13	29.5	55.6	2.3	8.3	337.5	NWN	0.0	0.0
20.10.22	14	30.3	54.3	2.3	8.3	315.0	NW	0.0	0.0
20.10.22	15	30.8	53.9	1.9	7.0	315.0	NW	0.0	0.0
20.10.22	16	28.8	53.5	5.3	19.1	315.0	NW	0.0	0.0
20.10.22	17	28.2	53.1	3.7	13.3	315.0	NW	0.0	0.0
20.10.22	18	27.6	52.7	1.8	6.5	270.0	W	0.0	0.0
20.10.22	19	27.0	52.9	1.7	6.1	247.5	SWW	0.0	0.0
20.10.22	20	26.2	53.2	1.8	6.5	45.0	NE	0.0	0.0
20.10.22	21	25.0	53.7	0.8	2.9	45.0	NE	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
20.10.22	22	23.4	54.1	0.2	0.7	292.5	WNW	0.0	0.0
20.10.22	23	22.7	54.8	0.2	0.7	112.5	ESE	0.0	0.0
20.10.22	24	20.8	55.4	0.3	1.1	135.0	SE	0.0	0.0
21.10.22	1	20.1	56.9	0.4	1.4	135.0	SE	0.0	0.0
21.10.22	2	19.8	58.2	0.5	1.8	157.5	SES	0.0	0.0
21.10.22	3	19.3	59.0	0.2	0.7	180.0	S	0.0	0.0
21.10.22	4	19.0	59.6	0.4	1.4	180.0	S	0.0	0.0
21.10.22	5	19.3	61.2	0.4	1.4	202.5	SSW	0.0	0.0
21.10.22	6	19.2	61.8	0.7	2.5	210.0	SSW	0.0	0.0
21.10.22	7	20.7	61.0	1.1	4.0	22.5	NNE	0.0	0.0
21.10.22	8	22.1	60.4	0.6	2.2	247.5	SWW	0.0	0.0
21.10.22	9	23.4	59.0	1.1	4.0	45.0	NE	0.0	0.0
21.10.22	10	25.7	58.6	1.4	5.0	225.0	SW	0.0	0.0
21.10.22	11	27.3	58.3	1.3	4.7	292.5	WNW	0.0	0.0
21.10.22	12	29.8	56.7	2.2	7.9	225.0	SW	0.0	0.0
21.10.22	13	30.8	55.3	2.4	8.6	315.0	NW	0.0	0.0
21.10.22	14	30.2	54.8	2.4	8.6	270.0	W	0.0	0.0
21.10.22	15	30.0	54.0	2.5	9.0	315.0	NW	0.0	0.0
21.10.22	16	29.6	53.6	1.9	7.0	315.0	NW	0.0	0.0
21.10.22	17	29.1	53.3	3.7	13.3	315.0	NW	0.0	0.0
21.10.22	18	27.7	52.9	2.1	7.6	315.0	NW	0.0	0.0
21.10.22	19	26.2	53.4	2.2	7.9	67.5	ENE	0.0	0.0
21.10.22	20	24.7	53.8	1.3	4.7	135.0	SE	0.0	0.0
21.10.22	21	22.6	54.4	0.2	0.7	112.5	ESE	0.0	0.0
21.10.22	22	21.3	54.7	1.1	4.0	135.0	SE	0.0	0.0
21.10.22	23	20.7	55.1	0.2	0.7	135.0	SE	0.0	0.0
21.10.22	24	19.6	55.6	0.5	1.8	157.5	SES	0.0	0.0
22.10.22	1	18.3	57.2	0.3	1.1	180.0	S	0.0	0.0
22.10.22	2	16.8	58.4	0.2	0.7	180.0	S	0.0	0.0
22.10.22	3	16.1	59.3	0.3	1.1	202.5	SSW	0.0	0.0
22.10.22	4	14.7	60.4	0.5	1.8	22.5	NNE	0.0	0.0
22.10.22	5	14.9	62.7	0.7	2.5	247.5	SWW	0.0	0.0
22.10.22	6	16.4	63.9	0.9	3.2	45.0	NE	0.0	0.0
22.10.22	7	18.3	63.4	1.1	4.0	45.0	NE	0.0	0.0
22.10.22	8	19.7	62.7	1.4	5.0	45.0	NE	0.0	0.0
22.10.22	9	22.5	62.0	1.7	6.1	292.5	WNW	0.0	0.0
22.10.22	10	24.4	61.3	2.2	7.9	225.0	SW	0.0	0.0
22.10.22	11	26.2	60.3	2.6	9.5	225.0	SW	0.0	0.0
22.10.22	12	28.1	59.6	1.4	5.0	225.0	SW	0.0	0.0
22.10.22	13	29.3	59.0	2.5	9.0	270.0	W	0.0	0.0
22.10.22	14	30.9	57.3	1.7	6.0	315.0	NW	0.0	0.0
22.10.22	15	30.0	55.2	3.7	13.3	315.0	NW	0.0	0.0
22.10.22	16	29.4	53.4	2.6	9.4	315.0	NW	0.0	0.0
22.10.22	17	28.7	52.7	1.1	4.0	315.0	NW	0.0	0.0
22.10.22	18	26.6	52.2	2.1	7.6	270.0	W	0.0	0.0
22.10.22	19	25.4	52.5	1.1	4.0	315.0	NW	0.0	0.0
22.10.22	20	24.8	52.9	1.1	4.0	90.0	E	0.0	0.0
22.10.22	21	23.9	53.4	0.1	0.4	270.0	W	0.0	0.0
22.10.22	22	23.1	53.8	0.4	1.4	67.5	ENE	0.0	0.0
22.10.22	23	22.4	55.0	0.6	2.2	135.0	SE	0.0	0.0
22.10.22	24	21.6	55.6	0.2	0.7	135.0	SE	0.0	0.0
23.10.22	1	20.4	68.9	0.5	1.8	135.0	SE	0.0	0.0
23.10.22	2	19.7	70.0	0.7	2.5	157.5	SES	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
23.10.22	3	19.2	66.7	0.7	2.5	180.0	S	0.0	0.0
23.10.22	4	19.3	65.8	1.3	4.7	202.5	SSW	0.0	0.0
23.10.22	5	19.3	62.3	0.4	1.4	210.0	SSW	0.0	0.0
23.10.22	6	19.0	62.5	1.2	4.3	22.5	NNE	0.0	0.0
23.10.22	7	19.8	62.1	1.1	4.0	180.0	S	0.0	0.0
23.10.22	8	22.4	61.6	0.7	2.5	22.5	NNE	0.0	0.0
23.10.22	9	24.8	60.8	1.2	4.5	22.5	NNE	0.0	0.0
23.10.22	10	26.4	59.5	1.4	5.0	270.0	W	0.0	0.0
23.10.22	11	28.9	59.3	1.4	5.0	45.0	NE	0.0	0.0
23.10.22	12	29.5	57.4	2.3	8.3	225.0	SW	0.0	0.0
23.10.22	13	30.0	56.4	1.8	6.5	337.5	NWN	0.0	0.0
23.10.22	14	29.3	58.0	2.2	7.9	315.0	NW	0.0	0.0
23.10.22	15	27.6	59.5	1.9	7.0	315.0	NW	0.0	0.0
23.10.22	16	27.3	57.0	2.5	9.0	315.0	NW	0.0	0.0
23.10.22	17	26.8	56.5	4.4	15.8	315.0	NW	0.0	0.0
23.10.22	18	26.4	54.0	2.4	8.6	315.0	NW	0.0	0.0
23.10.22	19	26.1	53.0	5.1	18.4	67.5	ENE	0.0	0.0
23.10.22	20	25.6	55.0	0.8	2.9	135.0	SE	0.0	0.0
23.10.22	21	25.3	56.0	0.5	1.8	112.5	ESE	0.0	0.0
23.10.22	22	25.0	58.0	0.4	1.4	135.0	SE	0.0	0.0
23.10.22	23	24.4	59.0	0.3	1.1	315.0	NW	0.0	0.0
23.10.22	24	24.0	60.5	0.5	1.8	157.5	SES	0.0	0.0
24.10.22	1	23.7	61.0	0.3	1.1	180.0	S	0.0	0.0
24.10.22	2	23.0	62.0	0.2	0.7	202.5	SSW	0.0	0.0
24.10.22	3	22.3	63.0	0.5	1.8	22.5	NNE	0.0	0.0
24.10.22	4	22.3	64.0	0.6	2.0	22.5	NNE	0.0	0.0
24.10.22	5	22.1	64.5	1.1	4.0	247.5	SWW	0.0	0.0
24.10.22	6	22.5	63.0	0.6	2.2	247.5	SWW	0.0	0.0
24.10.22	7	23.4	62.0	2.5	9.0	45.0	NE	0.0	0.0
24.10.22	8	24.0	60.4	2.3	8.3	45.0	NE	0.0	0.0
24.10.22	9	25.7	59.6	1.2	4.3	45.0	NE	0.0	0.0
24.10.22	10	26.0	58.3	2.2	7.9	270.0	W	0.0	0.0
24.10.22	11	26.7	57.7	3.7	13.3	180.0	S	0.0	0.0
24.10.22	12	27.4	57.2	1.7	6.1	270.0	W	0.0	0.0
24.10.22	13	27.8	56.3	4.2	15.1	315.0	NW	0.0	0.0
24.10.22	14	28.0	55.8	2.3	8.3	180.0	S	0.0	0.0
24.10.22	15	27.4	54.9	5.7	20.5	180.0	S	0.0	0.0
24.10.22	16	27.3	53.7	2.2	7.9	180.0	S	0.0	0.0
24.10.22	17	27.0	53.0	1.3	4.7	315.0	NW	0.0	0.0
24.10.22	18	26.8	52.6	1.1	4.0	315.0	NW	0.0	0.0
24.10.22	19	26.4	52.9	4.4	15.8	180.0	S	0.0	0.0
24.10.22	20	25.0	53.4	0.2	0.7	202.5	SSW	0.0	0.0
24.10.22	21	24.4	53.8	0.2	0.7	90.0	E	0.0	0.0
24.10.22	22	24.0	54.2	0.2	0.7	270.0	W	0.0	0.0
24.10.22	23	23.7	54.7	0.8	3.0	67.5	ENE	0.0	0.0
24.10.22	24	23.3	55.6	0.4	1.4	112.5	ESE	0.0	0.0
25.10.22	1	23.0	57.3	0.2	0.7	135.0	SE	0.0	0.0
25.10.22	2	23.3	58.8	0.3	1.1	157.5	SES	0.0	0.0
25.10.22	3	23.0	59.5	0.3	1.1	157.5	SES	0.0	0.0
25.10.22	4	22.7	60.2	0.5	1.8	180.0	S	0.0	0.0
25.10.22	5	22.1	61.7	0.7	2.5	202.5	SSW	0.0	0.0
25.10.22	6	22.3	62.3	0.9	3.2	22.5	NNE	0.0	0.0
25.10.22	7	22.8	61.8	1.2	4.3	247.5	SWW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
25.10.22	8	23.2	61.0	1.4	5.0	247.5	SWW	0.0	0.0
25.10.22	9	24.0	60.3	1.7	6.1	247.5	SWW	0.0	0.0
25.10.22	10	25.3	59.5	1.2	4.5	45.0	NE	0.0	0.0
25.10.22	11	26.8	58.8	1.8	6.5	315.0	NW	0.0	0.0
25.10.22	12	27.3	58.2	2.4	8.6	270.0	W	0.0	0.0
25.10.22	13	28.5	57.6	2.6	9.4	315.0	NW	0.0	0.0
25.10.22	14	28.9	55.4	3.7	13.3	292.5	WNW	0.0	0.0
25.10.22	15	29.0	53.9	1.9	7.0	292.5	WNW	0.0	0.0
25.10.22	16	28.4	53.0	3.7	13.3	45.0	NE	0.0	0.0
25.10.22	17	28.1	52.4	1.7	6.0	45.0	NE	0.0	0.0
25.10.22	18	27.7	52.3	2.5	9.0	292.5	WNW	0.0	0.0
25.10.22	19	27.4	52.8	2.1	7.6	270.0	W	0.0	0.0
25.10.22	20	27.2	53.7	0.7	2.5	90.0	E	0.0	0.0
25.10.22	21	26.5	54.2	0.4	1.4	270.0	W	0.0	0.0
25.10.22	22	25.7	54.8	0.2	0.7	337.5	NWN	0.0	0.0
25.10.22	23	25.0	55.5	0.5	1.8	337.5	NWN	0.0	0.0
25.10.22	24	24.7	56.1	0.3	1.1	315.0	NW	0.0	0.0
26.10.22	1	24.4	56.7	0.4	1.4	337.5	NWN	0.0	0.0
26.10.22	2	24.2	58.4	0.5	1.8	270.0	W	0.0	0.0
26.10.22	3	24.0	59.7	0.2	0.7	225.0	SW	0.0	0.0
26.10.22	4	23.6	60.3	0.3	1.1	337.5	NWN	0.0	0.0
26.10.22	5	23.2	61.1	0.8	3.0	315.0	NW	0.0	0.0
26.10.22	6	23.4	60.9	0.5	1.8	315.0	NW	0.0	0.0
26.10.22	7	23.7	60.3	1.1	4.0	315.0	NW	0.0	0.0
26.10.22	8	24.0	59.8	1.9	7.0	315.0	NW	0.0	0.0
26.10.22	9	24.8	59.2	1.9	7.0	315.0	NW	0.0	0.0
26.10.22	10	26.3	58.5	1.7	6.0	315.0	NW	0.0	0.0
26.10.22	11	27.5	56.7	2.6	9.5	315.0	NW	0.0	0.0
26.10.22	12	28.2	55.8	1.9	7.0	315.0	NW	0.0	0.0
26.10.22	13	28.7	55.3	3.7	13.3	315.0	NW	0.0	0.0
26.10.22	14	29.0	54.7	4.7	16.9	270.0	W	0.0	0.0
26.10.22	15	28.5	53.8	5.2	18.7	315.0	NW	0.0	0.0
26.10.22	16	28.3	53.0	3.9	14.0	315.0	NW	0.0	0.0
26.10.22	17	28.0	52.6	3.3	11.9	315.0	NW	0.0	0.0
26.10.22	18	27.7	51.6	2.2	7.9	67.5	ENE	0.0	0.0
26.10.22	19	27.5	51.8	1.3	4.7	360.0	N	0.0	0.0
26.10.22	20	27.1	52.4	0.6	2.0	135.0	SE	0.0	0.0
26.10.22	21	26.3	53.8	0.4	1.4	112.5	ESE	0.0	0.0
26.10.22	22	25.2	54.2	0.3	1.1	135.0	SE	0.0	0.0
26.10.22	23	24.0	54.7	0.6	2.2	315.0	NW	0.0	0.0
26.10.22	24	23.5	55.5	2.2	7.9	157.5	SES	0.0	0.0
27.10.22	1	23.0	55.9	0.4	1.4	180.0	S	0.0	0.0
27.10.22	2	22.3	56.7	0.6	2.2	180.0	S	0.0	0.0
27.10.22	3	22.0	58.6	0.2	0.7	202.5	SSW	0.0	0.0
27.10.22	4	21.6	60.2	0.5	1.8	22.5	NNE	0.0	0.0
27.10.22	5	21.3	61.7	0.7	2.5	247.5	SWW	0.0	0.0
27.10.22	6	21.9	63.6	0.4	1.4	22.5	NNE	0.0	0.0
27.10.22	7	23.5	63.0	1.2	4.5	45.0	NE	0.0	0.0
27.10.22	8	24.5	62.5	0.9	3.2	45.0	NE	0.0	0.0
27.10.22	9	24.9	61.7	0.7	2.5	292.5	WNW	0.0	0.0
27.10.22	10	25.3	61.4	2.2	7.9	315.0	NW	0.0	0.0
27.10.22	11	26.4	60.6	1.1	4.0	315.0	NW	0.0	0.0
27.10.22	12	27.8	59.4	1.4	5.0	315.0	NW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
27.10.22	13	28.2	58.4	2.3	8.3	270.0	W	0.0	0.0
27.10.22	14	28.8	56.4	2.3	8.3	315.0	NW	0.0	0.0
27.10.22	15	28.4	55.3	2.2	7.9	67.5	ENE	0.0	0.0
27.10.22	16	27.5	53.9	2.3	8.3	315.0	NW	0.0	0.0
27.10.22	17	27.0	52.7	2.8	10.1	315.0	NW	0.0	0.0
27.10.22	18	26.7	52.2	1.4	5.0	315.0	NW	0.0	0.0
27.10.22	19	26.2	52.5	1.6	5.8	112.5	ESE	0.0	0.0
27.10.22	20	26.4	53.1	0.8	3.0	135.0	SE	0.0	0.0
27.10.22	21	26.1	54.7	0.2	0.7	135.0	SE	0.0	0.0
27.10.22	22	25.8	55.8	0.5	1.8	157.5	SES	0.0	0.0
27.10.22	23	25.4	56.4	0.7	2.5	180.0	S	0.0	0.0
27.10.22	24	24.7	56.9	1.2	4.3	180.0	S	0.0	0.0
28.10.22	1	23.6	57.7	0.5	1.8	180.0	S	0.0	0.0
28.10.22	2	22.2	58.4	0.2	0.7	202.5	SSW	0.0	0.0
28.10.22	3	21.4	59.3	0.5	1.8	210.0	SSW	0.0	0.0
28.10.22	4	20.9	60.2	0.3	1.1	22.5	NNE	0.0	0.0
28.10.22	5	20.3	60.8	0.4	1.4	22.5	NNE	0.0	0.0
28.10.22	6	20.5	62.2	0.7	2.5	22.5	NNE	0.0	0.0
28.10.22	7	21.5	61.8	0.7	2.5	247.5	SWW	0.0	0.0
28.10.22	8	22.6	61.1	1.3	4.7	247.5	SWW	0.0	0.0
28.10.22	9	24.3	60.4	1.1	4.0	247.5	SWW	0.0	0.0
28.10.22	10	25.5	59.7	1.3	4.7	45.0	NE	0.0	0.0
28.10.22	11	26.1	58.3	1.9	6.8	45.0	NE	0.0	0.0
28.10.22	12	28.8	57.8	1.8	6.5	270.0	W	0.0	0.0
28.10.22	13	30.4	57.1	2.3	8.3	315.0	NW	0.0	0.0
28.10.22	14	30.8	56.3	1.9	7.0	292.5	WNW	0.0	0.0
28.10.22	15	30.2	55.3	3.7	13.3	292.5	WNW	0.0	0.0
28.10.22	16	30.7	53.2	2.6	9.5	45.0	NE	0.0	0.0
28.10.22	17	30.1	52.8	1.9	7.0	315.0	NW	0.0	0.0
28.10.22	18	29.4	51.7	2.1	7.6	225.0	SW	0.0	0.0
28.10.22	19	28.6	52.2	2.2	7.9	270.0	W	0.0	0.0
28.10.22	20	27.3	52.6	0.8	2.9	270.0	W	0.0	0.0
28.10.22	21	26.8	53.1	0.6	2.0	337.5	NWN	0.0	0.0
28.10.22	22	26.3	53.7	0.6	2.0	337.5	NWN	0.0	0.0
28.10.22	23	25.7	54.5	0.3	1.1	315.0	NW	0.0	0.0
28.10.22	24	25.0	55.5	0.4	1.4	315.0	NW	0.0	0.0
29.10.22	1	23.6	56.6	1.1	4.0	90.0	E	0.0	0.0
29.10.22	2	21.4	56.9	0.6	2.0	315.0	NW	0.0	0.0
29.10.22	3	19.7	58.3	0.4	1.4	67.5	ENE	0.0	0.0
29.10.22	4	18.4	60.1	0.5	1.8	135.0	SE	0.0	0.0
29.10.22	5	20.4	61.3	0.8	2.9	135.0	SE	0.0	0.0
29.10.22	6	20.9	63.5	1.1	4.0	112.5	ESE	0.0	0.0
29.10.22	7	21.2	63.0	1.4	5.0	135.0	SE	0.0	0.0
29.10.22	8	22.3	62.2	1.9	6.8	157.5	SES	0.0	0.0
29.10.22	9	23.1	60.8	1.7	6.0	180.0	S	0.0	0.0
29.10.22	10	23.7	59.8	2.3	8.3	315.0	NW	0.0	0.0
29.10.22	11	24.7	59.0	3.7	13.3	337.5	NWN	0.0	0.0
29.10.22	12	26.3	58.3	1.2	4.5	315.0	NW	0.0	0.0
29.10.22	13	28.5	57.1	1.4	5.0	315.0	NW	0.0	0.0
29.10.22	14	30.7	55.7	2.3	8.3	315.0	NW	0.0	0.0
29.10.22	15	31.0	56.3	3.7	13.3	337.5	NWN	0.0	0.0
29.10.22	16	30.8	54.8	2.1	7.6	315.0	NW	0.0	0.0
29.10.22	17	30.2	52.3	1.4	5.0	315.0	NW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
29.10.22	18	29.4	51.5	1.9	7.0	270.0	W	0.0	0.0
29.10.22	19	28.6	51.3	1.6	5.8	157.5	SES	0.0	0.0
29.10.22	20	26.8	51.9	0.2	0.7	180.0	S	0.0	0.0
29.10.22	21	25.3	52.6	0.2	0.7	315.0	NW	0.0	0.0
29.10.22	22	24.4	53.2	0.2	0.7	67.5	ENE	0.0	0.0
29.10.22	23	22.8	53.8	0.7	2.5	135.0	SE	0.0	0.0
29.10.22	24	21.6	54.1	0.2	0.7	112.5	ESE	0.0	0.0
30.10.22	1	20.4	54.9	0.2	0.7	112.5	ESE	0.0	0.0
30.10.22	2	18.9	56.4	0.5	1.8	135.0	SE	0.0	0.0
30.10.22	3	18.2	57.9	0.7	2.5	157.5	SES	0.0	0.0
30.10.22	4	17.5	59.6	0.2	0.7	180.0	S	0.0	0.0
30.10.22	5	18.1	61.5	0.9	3.2	202.5	SSW	0.0	0.0
30.10.22	6	19.3	62.7	0.3	1.1	210.0	SSW	0.0	0.0
30.10.22	7	20.2	62.0	2.2	7.9	22.5	NNE	0.0	0.0
30.10.22	8	21.7	61.5	1.7	6.0	247.5	SWW	0.0	0.0
30.10.22	9	22.8	60.5	1.2	4.3	247.5	SWW	0.0	0.0
30.10.22	10	24.7	59.7	1.6	5.8	45.0	NE	0.0	0.0
30.10.22	11	26.3	59.1	1.8	6.5	45.0	NE	0.0	0.0
30.10.22	12	27.6	58.4	2.5	9.0	45.0	NE	0.0	0.0
30.10.22	13	29.7	56.3	2.3	8.3	292.5	WNW	0.0	0.0
30.10.22	14	30.8	55.4	3.7	13.3	270.0	W	0.0	0.0
30.10.22	15	30.2	53.7	2.1	7.6	315.0	NW	0.0	0.0
30.10.22	16	29.8	52.1	2.5	9.0	45.0	NE	0.0	0.0
30.10.22	17	29.3	51.5	2.3	8.3	292.5	WNW	0.0	0.0
30.10.22	18	29.0	52.9	1.9	7.0	225.0	SW	0.0	0.0
30.10.22	19	28.9	52.9	2.5	9.0	225.0	SW	0.0	0.0
30.10.22	20	28.3	51.9	2.6	9.4	225.0	SW	0.0	0.0
30.10.22	21	27.7	51.5	1.4	5.0	337.5	NWN	0.0	0.0
30.10.22	22	26.5	52.4	0.2	0.7	337.5	NWN	0.0	0.0
30.10.22	23	25.0	53.7	0.7	2.5	315.0	NW	0.0	0.0
30.10.22	24	23.7	54.8	0.5	1.8	315.0	NW	0.0	0.0
31.10.22	1	22.7	55.6	0.4	1.4	270.0	W	0.0	0.0
31.10.22	2	22.3	57.7	0.2	0.7	315.0	NW	0.0	0.0
31.10.22	3	21.4	58.4	0.4	1.4	270.0	W	0.0	0.0
31.10.22	4	20.7	60.3	0.3	1.1	315.0	NW	0.0	0.0
31.10.22	5	19.4	61.5	1.1	4.0	315.0	NW	0.0	0.0
31.10.22	6	18.6	62.2	0.5	1.8	67.5	ENE	0.0	0.0
31.10.22	7	19.8	61.7	0.8	3.0	135.0	SE	0.0	0.0
31.10.22	8	20.7	60.3	1.7	6.0	112.5	ESE	0.0	0.0
31.10.22	9	21.2	58.7	1.9	7.0	135.0	SE	0.0	0.0
31.10.22	10	22.4	58.1	2.2	8.0	270.0	W	0.0	0.0
31.10.22	11	23.7	56.7	1.6	5.8	157.5	SES	0.0	0.0
31.10.22	12	25.2	55.0	1.8	6.5	180.0	S	0.0	0.0
31.10.22	13	27.6	53.4	2.2	7.9	225.0	SW	0.0	0.0
31.10.22	14	28.9	52.1	1.7	6.0	225.0	SW	0.0	0.0
31.10.22	15	31.0	51.7	3.7	13.3	225.0	SW	0.0	0.0
31.10.22	16	30.8	51.5	2.2	7.9	337.5	NWN	0.0	0.0
31.10.22	17	29.5	51.9	2.2	7.9	202.5	SSW	0.0	0.0
31.10.22	18	28.5	52.0	2.2	7.9	315.0	NW	0.0	0.0
31.10.22	19	26.8	51.5	2.2	7.9	247.5	SWW	0.0	0.0
31.10.22	20	26.0	53.7	0.7	2.5	45.0	NE	0.0	0.0
31.10.22	21	25.5	54.2	1.1	4.0	45.0	NE	0.0	0.0
31.10.22	22	24.3	56.8	0.5	1.8	292.5	WNW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
31.10.22	23	22.6	57.0	0.4	1.4	270.0	W	0.0	0.0
31.10.22	24	21.8	57.4	0.5	1.8	270.0	W	0.0	0.0
11.1.22	1	21.3	57.9	0.3	1.1	315.0	NW	0.0	0.0
11.1.22	2	20.3	60.2	0.8	2.9	225.0	SW	0.0	0.0
11.1.22	3	19.8	63.1	1.1	4.0	135.0	SE	0.0	0.0
11.1.22	4	19.3	63.2	0.3	1.1	90.0	E	0.0	0.0
11.1.22	5	19.4	60.4	0.2	0.7	337.5	NWN	0.0	0.0
11.1.22	6	20.6	65.9	0.5	1.8	135.0	SE	0.0	0.0
11.1.22	7	21.4	66.7	0.7	2.5	270.0	W	0.0	0.0
11.1.22	8	23.1	67.7	2.2	7.9	270.0	W	0.0	0.0
11.1.22	9	24.6	69.4	1.1	4.0	135.0	SE	0.0	0.0
11.1.22	10	26.1	71.1	0.9	3.2	270.0	W	0.0	0.0
11.1.22	11	27.5	68.3	2.2	8.0	270.0	W	0.0	0.0
11.1.22	12	27.2	67.3	1.1	4.0	315.0	NW	0.0	0.0
11.1.22	13	26.3	65.5	2.2	7.9	270.0	W	0.0	0.0
11.1.22	14	28.1	63.3	2.2	7.9	315.0	NW	0.0	0.0
11.1.22	15	30.6	62.1	2.2	7.9	315.0	NW	0.0	0.0
11.1.22	16	29.7	63.2	2.4	8.6	315.0	NW	0.0	0.0
11.1.22	17	29.1	64.3	1.6	5.8	45.0	NE	0.0	0.0
11.1.22	18	27.4	66.6	2.3	8.3	45.0	NE	0.0	0.0
11.1.22	19	26.5	59.4	1.1	4.0	315.0	NW	0.0	0.0
11.1.22	20	26.1	70.3	0.4	1.4	135.0	SE	0.0	0.0
11.1.22	21	25.3	55.0	0.7	2.5	315.0	NW	0.0	0.0
11.1.22	22	23.6	59.7	0.4	1.4	135.0	SE	0.0	0.0
11.1.22	23	22.7	63.2	0.3	1.1	270.0	W	0.0	0.0
11.1.22	24	22.2	69.3	0.6	2.2	270.0	W	0.0	0.0
11.2.22	1	21.7	68.2	0.4	1.4	315.0	NW	0.0	0.0
11.2.22	2	21.3	65.1	0.1	0.4	315.0	NW	0.0	0.0
11.2.22	3	21.3	67.8	0.9	3.1	67.5	ENE	0.0	0.0
11.2.22	4	20.4	70.3	0.5	1.8	135.0	SE	0.0	0.0
11.2.22	5	19.6	71.1	0.3	1.2	112.5	ESE	0.0	0.0
11.2.22	6	21.3	63.0	0.8	2.9	247.5	SWW	0.0	0.0
11.2.22	7	24.1	57.0	1.1	4.0	157.5	SES	0.0	0.0
11.2.22	8	25.8	54.0	2.2	8.0	90.0	E	0.0	0.0
11.2.22	9	27.2	54.0	1.6	5.8	225.0	SW	0.0	0.0
11.2.22	10	28.2	59.0	1.9	6.8	225.0	SW	0.0	0.0
11.2.22	11	28.8	63.0	2.2	7.9	90.0	E	0.0	0.0
11.2.22	12	29.5	55.0	1.9	6.8	315.0	NW	0.0	0.0
11.2.22	13	30.4	61.0	2.2	7.9	315.0	NW	0.0	0.0
11.2.22	14	32.7	59.0	2.4	8.6	270.0	W	0.0	0.0
11.2.22	15	33.1	56.0	3.7	13.3	315.0	NW	0.0	0.0
11.2.22	16	32.1	57.0	5.1	18.4	315.0	NW	0.0	0.0
11.2.22	17	31.0	64.0	1.4	4.9	315.0	NW	0.0	0.0
11.2.22	18	29.3	53.0	1.2	4.3	315.0	NW	0.0	0.0
11.2.22	19	27.6	55.0	1.4	4.9	135.0	SE	0.0	0.0
11.2.22	20	26.1	54.0	1.9	6.8	135.0	SE	0.0	0.0
11.2.22	21	24.2	61.0	0.8	2.9	135.0	SE	0.0	0.0
11.2.22	22	22.7	56.0	0.6	2.2	315.0	NW	0.0	0.0
11.2.22	23	21.8	53.0	0.4	1.4	135.0	SE	0.0	0.0
11.2.22	24	21.4	64.0	0.5	1.9	315.0	NW	0.0	0.0
11.3.22	1	21.9	65.5	0.3	1.1	315.0	NW	0.0	0.0
11.3.22	2	21.5	66.0	0.5	1.8	315.0	NW	0.0	0.0
11.3.22	3	21.3	67.5	0.5	1.8	135.0	SE	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
11.3.22	4	20.3	68.5	0.7	2.5	45.0	NE	0.0	0.0
11.3.22	5	20.0	69.2	1.1	4.0	45.0	NE	0.0	0.0
11.3.22	6	20.8	71.7	1.4	5.0	45.0	NE	0.0	0.0
11.3.22	7	22.0	72.7	1.2	4.3	112.5	ESE	0.0	0.0
11.3.22	8	24.1	73.1	1.8	6.5	247.5	SWW	0.0	0.0
11.3.22	9	25.6	70.6	1.2	4.3	157.5	SES	0.0	0.0
11.3.22	10	26.4	68.5	2.1	7.6	360.0	N	0.0	0.0
11.3.22	11	27.2	64.5	2.2	7.9	67.5	ENE	0.0	0.0
11.3.22	12	28.5	61.4	2.2	7.9	202.5	SSW	0.0	0.0
11.3.22	13	29.2	59.5	2.2	7.9	315.0	NW	0.0	0.0
11.3.22	14	30.0	61.0	2.6	9.4	315.0	NW	0.0	0.0
11.3.22	15	29.4	60.0	1.6	5.8	315.0	NW	0.0	0.0
11.3.22	16	28.7	63.0	3.7	13.3	315.0	NW	0.0	0.0
11.3.22	17	28.0	60.5	0.9	3.2	225.0	SW	0.0	0.0
11.3.22	18	25.1	62.0	2.2	8.0	90.0	E	0.0	0.0
11.3.22	19	23.7	63.0	1.2	4.3	90.0	E	0.0	0.0
11.3.22	20	23.4	55.0	0.6	2.2	337.5	NWN	0.0	0.0
11.3.22	21	23.4	63.0	0.6	2.2	315.0	NW	0.0	0.0
11.3.22	22	22.8	63.0	0.3	1.1	315.0	NW	0.0	0.0
11.3.22	23	22.3	59.0	0.3	1.2	315.0	NW	0.0	0.0
11.3.22	24	21.7	67.0	0.5	1.8	45.0	NE	0.0	0.0
11.4.22	1	20.6	55.0	0.4	1.4	135.0	SE	0.0	0.0
11.4.22	2	19.1	55.0	0.1	0.4	135.0	SE	0.0	0.0
11.4.22	3	18.5	56.0	0.5	1.8	135.0	SE	0.0	0.0
11.4.22	4	17.7	63.0	0.7	2.5	135.0	SE	0.0	0.0
11.4.22	5	17.2	63.0	0.9	3.1	315.0	NW	0.0	0.0
11.4.22	6	19.1	63.0	1.1	4.0	135.0	SE	0.0	0.0
11.4.22	7	21.7	57.0	0.9	3.1	339.0	NWN	0.0	0.0
11.4.22	8	23.6	65.0	0.6	2.2	45.0	NE	0.0	0.0
11.4.22	9	24.7	71.7	1.1	4.0	45.0	NE	0.0	0.0
11.4.22	10	25.3	68.5	2.2	8.0	270.0	W	0.0	0.0
11.4.22	11	26.8	69.3	1.7	6.1	270.0	W	0.0	0.0
11.4.22	12	27.6	71.0	2.3	8.3	315.0	NW	0.0	0.0
11.4.22	13	28.0	61.0	1.5	5.4	315.0	NW	0.0	0.0
11.4.22	14	27.2	56.0	2.6	9.4	315.0	NW	0.0	0.0
11.4.22	15	26.7	61.0	2.3	8.3	315.0	NW	0.0	0.0
11.4.22	16	26.0	63.0	1.4	4.9	315.0	NW	0.0	0.0
11.4.22	17	25.5	65.0	2.2	7.9	315.0	NW	0.0	0.0
11.4.22	18	25.1	61.0	2.2	7.9	315.0	NW	0.0	0.0
11.4.22	19	24.6	64.0	1.1	4.0	22.5	NNE	0.0	0.0
11.4.22	20	24.2	61.0	0.2	0.6	180.0	S	0.0	0.0
11.4.22	21	23.9	63.0	0.1	0.4	67.5	ENE	0.0	0.0
11.4.22	22	23.1	64.0	0.2	0.7	135.0	SE	0.0	0.0
11.4.22	23	22.6	61.0	0.2	0.7	112.5	ESE	0.0	0.0
11.4.22	24	21.7	57.0	0.7	2.5	247.5	SWW	0.0	0.0
11.5.22	1	21.2	62.2	0.1	0.4	157.5	SES	0.0	0.0
11.5.22	2	20.0	64.4	0.5	1.8	360.0	N	0.0	0.0
11.5.22	3	19.1	66.5	0.7	2.5	225.0	SW	0.0	0.0
11.5.22	4	17.2	67.9	0.5	1.8	225.0	SW	0.0	0.0
11.5.22	5	15.5	71.3	0.1	0.4	90.0	E	0.0	0.0
11.5.22	6	16.4	68.4	0.8	2.9	90.0	E	0.0	0.0
11.5.22	7	19.7	65.4	0.9	3.1	337.5	NWN	0.0	0.0
11.5.22	8	21.6	62.7	1.1	4.0	270.0	W	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
11.5.22	9	24.4	60.6	2.2	7.9	270.0	W	0.0	0.0
11.5.22	10	24.8	67.2	2.2	7.9	270.0	W	0.0	0.0
11.5.22	11	25.4	69.2	1.4	5.0	270.0	W	0.0	0.0
11.5.22	12	26.7	55.0	2.2	7.9	270.0	W	0.0	0.0
11.5.22	13	27.5	53.0	2.6	9.4	315.0	NW	0.0	0.0
11.5.22	14	27.8	56.0	1.6	5.8	135.0	SE	0.0	0.0
11.5.22	15	28.3	61.0	2.6	9.4	315.0	NW	0.0	0.0
11.5.22	16	28.1	54.0	1.9	6.8	315.0	NW	0.0	0.0
11.5.22	17	27.6	55.0	1.7	6.1	135.0	SE	0.0	0.0
11.5.22	18	27.1	65.0	1.3	4.7	315.0	NW	0.0	0.0
11.5.22	19	26.4	55.0	0.9	3.1	270.0	W	0.0	0.0
11.5.22	20	25.3	59.0	0.9	3.1	225.0	SW	0.0	0.0
11.5.22	21	24.0	65.0	0.5	1.9	45.0	NE	0.0	0.0
11.5.22	22	23.2	66.0	0.9	3.1	45.0	NE	0.0	0.0
11.5.22	23	22.2	61.0	0.5	1.8	45.0	NE	0.0	0.0
11.5.22	24	21.4	64.0	0.7	2.5	90.0	E	0.0	0.0
11.6.22	1	20.4	59.0	0.4	1.4	337.5	NWN	0.0	0.0
11.6.22	2	17.4	53.0	0.5	1.8	22.5	NNE	0.0	0.0
11.6.22	3	15.1	54.0	0.5	1.8	180.0	S	0.0	0.0
11.6.22	4	14.1	53.0	0.7	2.5	67.5	ENE	0.0	0.0
11.6.22	5	14.7	63.0	0.9	3.2	202.5	SSW	0.0	0.0
11.6.22	6	16.2	54.0	1.1	4.0	90.0	E	0.0	0.0
11.6.22	7	17.9	58.8	1.4	4.9	112.5	ESE	0.0	0.0
11.6.22	8	20.6	57.0	0.5	1.8	247.5	SWW	0.0	0.0
11.6.22	9	22.2	54.0	0.7	2.5	135.0	SE	0.0	0.0
11.6.22	10	23.1	64.0	2.2	7.9	360.0	N	0.0	0.0
11.6.22	11	23.8	54.0	1.6	5.8	135.0	SE	0.0	0.0
11.6.22	12	24.4	63.0	2.2	8.0	315.0	NW	0.0	0.0
11.6.22	13	26.2	63.0	1.9	6.8	315.0	NW	0.0	0.0
11.6.22	14	27.6	66.6	2.2	7.9	315.0	NW	0.0	0.0
11.6.22	15	28.6	68.5	2.4	8.6	315.0	NW	0.0	0.0
11.6.22	16	28.4	66.5	2.2	7.9	315.0	NW	0.0	0.0
11.6.22	17	27.7	63.7	2.2	7.9	315.0	NW	0.0	0.0
11.6.22	18	26.5	58.2	2.2	7.9	315.0	NW	0.0	0.0
11.6.22	19	26.0	58.7	2.3	8.3	315.0	NW	0.0	0.0
11.6.22	20	24.5	59.2	0.5	1.8	45.0	NE	0.0	0.0
11.6.22	21	23.4	59.8	1.4	4.9	45.0	NE	0.0	0.0
11.6.22	22	21.7	62.5	1.2	4.3	202.5	SSW	0.0	0.0
11.6.22	23	21.2	63.7	0.5	1.9	112.5	ESE	0.0	0.0
11.6.22	24	19.7	65.1	0.2	0.7	22.5	NNE	0.0	0.0
11.7.22	1	18.4	65.4	0.3	1.1	180.0	S	0.0	0.0
11.7.22	2	16.8	64.1	0.5	1.8	67.5	ENE	0.0	0.0
11.7.22	3	15.6	65.8	0.5	1.8	135.0	SE	0.0	0.0
11.7.22	4	14.4	66.2	0.4	1.4	315.0	NW	0.0	0.0
11.7.22	5	13.6	66.8	0.8	2.9	247.5	SWW	0.0	0.0
11.7.22	6	15.2	64.2	0.5	1.8	157.5	SES	0.0	0.0
11.7.22	7	16.6	62.3	1.1	4.0	360.0	N	0.0	0.0
11.7.22	8	18.3	61.8	2.2	8.0	135.0	SE	0.0	0.0
11.7.22	9	20.1	60.6	1.7	6.1	135.0	SE	0.0	0.0
11.7.22	10	21.7	59.9	1.9	6.8	315.0	NW	0.0	0.0
11.7.22	11	23.4	59.3	2.2	7.9	135.0	SE	0.0	0.0
11.7.22	12	25.2	58.4	2.7	9.7	270.0	W	0.0	0.0
11.7.22	13	26.4	56.3	2.2	7.9	315.0	NW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
11.7.22	14	27.8	55.2	2.2	7.9	315.0	NW	0.0	0.0
11.7.22	15	28.8	53.6	2.2	7.9	315.0	NW	0.0	0.0
11.7.22	16	28.3	53.1	2.4	8.6	135.0	SE	0.0	0.0
11.7.22	17	28.0	52.8	2.1	7.6	315.0	NW	0.0	0.0
11.7.22	18	27.1	51.7	1.7	6.2	225.0	SW	0.0	0.0
11.7.22	19	25.7	52.5	2.2	7.9	90.0	E	0.0	0.0
11.7.22	20	24.2	53.7	1.4	4.9	90.0	E	0.0	0.0
11.7.22	21	23.5	54.2	0.5	1.8	337.5	NWN	0.0	0.0
11.7.22	22	22.6	55.6	0.9	3.1	315.0	NW	0.0	0.0
11.7.22	23	21.6	56.4	0.9	3.1	45.0	NE	0.0	0.0
11.7.22	24	20.7	56.9	0.1	0.4	45.0	NE	0.0	0.0
11.7.22	1	19.6	57.8	0.2	0.7	45.0	NE	0.0	0.0
11.8.22	2	17.7	59.4	1.2	4.3	135.0	SE	0.0	0.0
11.8.22	3	16.3	61.7	0.5	1.8	135.0	SE	0.0	0.0
11.8.22	4	15.2	63.7	0.8	2.9	135.0	SE	0.0	0.0
11.8.22	5	14.6	65.2	1.2	4.3	225.0	SW	0.0	0.0
11.8.22	6	16.1	65.0	0.7	2.5	135.0	SE	0.0	0.0
11.8.22	7	17.5	64.8	0.9	3.1	315.0	NW	0.0	0.0
11.8.22	8	18.9	64.0	1.7	6.2	135.0	SE	0.0	0.0
11.8.22	9	20.6	62.7	1.1	4.0	315.0	NW	0.0	0.0
11.8.22	10	21.0	59.3	0.5	1.8	270.0	W	0.0	0.0
11.8.22	11	22.4	57.2	2.2	7.9	315.0	NW	0.0	0.0
11.8.22	12	24.3	56.8	2.3	8.3	270.0	W	0.0	0.0
11.8.22	13	25.3	54.5	2.2	8.0	315.0	NW	0.0	0.0
11.8.22	14	26.8	52.1	2.2	7.9	315.0	NW	0.0	0.0
11.8.22	15	27.8	50.6	2.2	7.9	315.0	NW	0.0	0.0
11.8.22	16	27.2	48.4	2.2	7.9	315.0	NW	0.0	0.0
11.8.22	17	27.0	49.7	3.7	13.3	315.0	NW	0.0	0.0
11.8.22	18	25.3	50.0	2.4	8.6	22.5	NNE	0.0	0.0
11.8.22	19	23.7	50.2	1.4	5.0	180.0	S	0.0	0.0
11.8.22	20	22.1	50.8	0.6	2.2	67.5	ENE	0.0	0.0
11.8.22	21	20.7	51.7	0.5	1.8	202.5	SSW	0.0	0.0
11.8.22	22	19.7	52.2	0.2	0.7	90.0	E	0.0	0.0
11.8.22	23	17.8	52.5	0.9	3.1	112.5	ESE	0.0	0.0
11.8.22	24	16.8	53.1	0.5	1.8	247.5	SWW	0.0	0.0
11.9.22	1	15.7	54.0	0.2	0.7	157.5	SES	0.0	0.0
11.9.22	2	14.4	57.8	1.4	4.9	360.0	N	0.0	0.0
11.9.22	3	13.3	58.5	0.7	2.5	225.0	SW	0.0	0.0
11.9.22	4	11.9	59.4	0.5	1.8	225.0	SW	0.0	0.0
11.9.22	5	10.3	62.7	0.5	1.8	90.0	E	0.0	0.0
11.9.22	6	11.4	63.5	1.2	4.3	90.0	E	0.0	0.0
11.9.22	7	13.6	61.4	0.9	3.1	337.5	NWN	0.0	0.0
11.9.22	8	15.4	60.2	0.6	2.2	135.0	SE	0.0	0.0
11.9.22	9	17.8	58.4	0.7	2.5	270.0	W	0.0	0.0
11.9.22	10	20.5	57.3	1.1	4.0	270.0	W	0.0	0.0
11.9.22	11	21.5	56.7	1.4	5.0	270.0	W	0.0	0.0
11.9.22	12	24.8	54.2	0.7	2.5	315.0	NW	0.0	0.0
11.9.22	13	27.1	52.7	2.2	7.9	315.0	NW	0.0	0.0
11.9.22	14	27.8	50.6	2.2	7.9	315.0	NW	0.0	0.0
11.9.22	15	28.4	48.2	2.2	8.0	315.0	NW	0.0	0.0
11.9.22	16	28.0	47.3	2.1	7.6	315.0	NW	0.0	0.0
11.9.22	17	28.0	47.0	2.2	8.0	315.0	NW	0.0	0.0
11.9.22	18	27.0	47.9	1.1	4.0	315.0	NW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
11.9.22	19	25.5	48.6	0.6	2.2	315.0	NW	0.0	0.0
11.9.22	20	24.3	49.2	0.7	2.5	315.0	NW	0.0	0.0
11.9.22	21	22.6	51.5	0.2	0.7	270.0	W	0.0	0.0
11.9.22	22	21.2	52.7	0.5	1.9	270.0	W	0.0	0.0
11.9.22	23	20.2	54.3	0.3	1.1	45.0	NE	0.0	0.0
11.9.22	24	19.6	56.8	0.2	0.7	45.0	NE	0.0	0.0
11.10.22	1	18.6	57.2	0.2	0.7	45.0	NE	0.0	0.0
11.10.22	2	17.8	57.6	0.5	1.8	135.0	SE	0.0	0.0
11.10.22	3	16.6	58.4	0.2	0.7	135.0	SE	0.0	0.0
11.10.22	4	15.4	60.2	0.2	0.7	22.5	NNE	0.0	0.0
11.10.22	5	14.9	62.3	0.8	2.9	180.0	S	0.0	0.0
11.10.22	6	16.6	62.7	0.2	0.7	67.5	ENE	0.0	0.0
11.10.22	7	18.2	61.5	1.2	4.3	202.5	SSW	0.0	0.0
11.10.22	8	20.4	60.7	1.1	4.0	112.5	ESE	0.0	0.0
11.10.22	9	21.8	59.3	1.4	5.0	247.5	SWW	0.0	0.0
11.10.22	10	22.5	57.4	1.9	6.8	157.5	SES	0.0	0.0
11.10.22	11	24.1	55.3	2.2	7.9	360.0	N	0.0	0.0
11.10.22	12	25.3	52.7	2.3	8.3	225.0	SW	0.0	0.0
11.10.22	13	25.7	50.5	1.9	6.8	202.5	SSW	0.0	0.0
11.10.22	14	26.2	48.2	1.1	4.0	202.5	SSW	0.0	0.0
11.10.22	15	26.7	47.6	2.2	7.9	337.5	NWN	0.0	0.0
11.10.22	16	26.4	47.2	2.2	7.9	315.0	NW	0.0	0.0
11.10.22	17	26.2	47.9	1.7	6.2	315.0	NW	0.0	0.0
11.10.22	18	25.0	48.5	1.9	6.8	315.0	NW	0.0	0.0
11.10.22	19	25.1	48.9	1.3	4.7	135.0	SE	0.0	0.0
11.10.22	20	24.7	49.3	0.7	2.5	270.0	W	0.0	0.0
11.10.22	21	23.7	50.1	0.5	1.8	270.0	W	0.0	0.0
11.10.22	22	21.6	50.8	0.5	1.8	135.0	SE	0.0	0.0
11.10.22	23	19.6	51.5	0.1	0.4	135.0	SE	0.0	0.0
11.10.22	24	18.2	52.7	0.1	0.4	135.0	SE	0.0	0.0
11.11.22	1	16.7	54.9	0.1	0.4	270.0	W	0.0	0.0
11.11.22	2	15.5	57.3	0.5	1.8	270.0	W	0.0	0.0
11.11.22	3	14.9	58.2	0.7	2.5	270.0	W	0.0	0.0
11.11.22	4	14.4	58.8	0.9	3.2	315.0	NW	0.0	0.0
11.11.22	5	14.8	59.9	0.1	0.4	45.0	NE	0.0	0.0
11.11.22	6	15.3	60.4	1.2	4.3	45.0	NE	0.0	0.0
11.11.22	7	16.3	59.5	0.6	2.2	45.0	NE	0.0	0.0
11.11.22	8	17.5	59.1	1.2	4.3	135.0	SE	0.0	0.0
11.11.22	9	19.4	58.4	1.9	6.8	135.0	SE	0.0	0.0
11.11.22	10	21.1	57.3	2.2	8.0	315.0	NW	0.0	0.0
11.11.22	11	22.8	56.7	2.2	7.9	135.0	SE	0.0	0.0
11.11.22	12	23.5	54.2	1.3	4.7	315.0	NW	0.0	0.0
11.11.22	13	24.7	53.1	2.2	7.9	315.0	NW	0.0	0.0
11.11.22	14	25.5	51.5	2.2	7.9	315.0	NW	0.0	0.0
11.11.22	15	25.8	48.9	1.9	6.8	315.0	NW	0.0	0.0
11.11.22	16	25.5	47.6	1.3	4.7	315.0	NW	0.0	0.0
11.11.22	17	25.1	47.1	4.2	15.1	315.0	NW	0.0	0.0
11.11.22	18	24.8	47.0	0.8	2.9	315.0	NW	0.0	0.0
11.11.22	19	23.7	48.3	1.2	4.3	225.0	SW	0.0	0.0
11.11.22	20	22.4	48.9	0.5	1.8	202.5	SSW	0.0	0.0
11.11.22	21	21.7	49.5	0.5	1.8	90.0	E	0.0	0.0
11.11.22	22	20.1	50.1	0.2	0.7	337.5	NWN	0.0	0.0
11.11.22	23	19.3	50.7	0.5	1.8	202.5	SSW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
11.11.22	24	17.8	51.4	0.3	1.1	90.0	E	0.0	0.0
11.12.22	1	17.2	53.6	0.2	0.7	112.5	ESE	0.0	0.0
11.12.22	2	16.6	54.8	0.5	1.8	247.5	SWW	0.0	0.0
11.12.22	3	16.2	56.2	0.8	2.9	157.5	SES	0.0	0.0
11.12.22	4	15.7	57.6	0.2	0.7	360.0	N	0.0	0.0
11.12.22	5	15.4	58.9	0.2	0.7	135.0	SE	0.0	0.0
11.12.22	6	16.5	61.2	1.1	4.0	135.0	SE	0.0	0.0
11.12.22	7	17.6	60.5	0.8	2.9	225.0	SW	0.0	0.0
11.12.22	8	18.6	59.8	1.1	4.0	135.0	SE	0.0	0.0
11.12.22	9	19.9	57.7	1.4	5.0	270.0	W	0.0	0.0
11.12.22	10	21.7	57.0	1.8	6.5	315.0	NW	0.0	0.0
11.12.22	11	23.5	56.2	2.2	7.9	315.0	NW	0.0	0.0
11.12.22	12	24.7	53.4	1.9	6.8	315.0	NW	0.0	0.0
11.12.22	13	25.7	52.1	2.2	7.9	315.0	NW	0.0	0.0
11.12.22	14	26.3	50.5	2.2	7.9	135.0	SE	0.0	0.0
11.12.22	15	26.9	48.7	3.7	13.3	315.0	NW	0.0	0.0
11.12.22	16	27.3	48.0	2.3	8.3	315.0	NW	0.0	0.0
11.12.22	17	27.7	47.7	2.2	7.9	270.0	W	0.0	0.0
11.12.22	18	26.3	47.8	1.4	5.0	315.0	NW	0.0	0.0
11.12.22	19	25.1	48.1	0.7	2.5	135.0	SE	0.0	0.0
11.12.22	20	23.7	48.7	0.5	1.9	225.0	SW	0.0	0.0
11.12.22	21	22.6	49.3	2.2	7.9	67.5	ENE	0.0	0.0
11.12.22	22	22.1	50.5	0.5	1.8	202.5	SSW	0.0	0.0
11.12.22	23	21.2	50.9	0.2	0.7	112.5	ESE	0.0	0.0
11.12.22	24	20.3	51.3	0.5	1.8	247.5	SWW	0.0	0.0
13.11.22	1	19.4	53.7	0.2	0.7	157.5	SES	0.0	0.0
13.11.22	2	17.6	54.9	0.2	0.7	360.0	N	0.0	0.0
13.11.22	3	15.3	56.3	0.5	1.8	225.0	SW	0.0	0.0
13.11.22	4	13.9	58.5	0.8	2.9	225.0	SW	0.0	0.0
13.11.22	5	13.5	59.4	0.9	3.1	90.0	E	0.0	0.0
13.11.22	6	13.8	59.0	1.2	4.3	90.0	E	0.0	0.0
13.11.22	7	14.5	58.2	1.1	4.0	337.5	NWN	0.0	0.0
13.11.22	8	16.0	57.7	0.7	2.5	270.0	W	0.0	0.0
13.11.22	9	17.9	56.3	1.4	5.0	270.0	W	0.0	0.0
13.11.22	10	18.3	56.0	1.9	6.8	270.0	W	0.0	0.0
13.11.22	11	20.2	55.8	2.2	7.9	270.0	W	0.0	0.0
13.11.22	12	23.3	55.2	1.8	6.5	315.0	NW	0.0	0.0
13.11.22	13	25.8	54.4	3.7	13.3	315.0	NW	0.0	0.0
13.11.22	14	26.0	51.9	2.6	9.4	270.0	W	0.0	0.0
13.11.22	15	25.5	48.5	2.4	8.6	135.0	SE	0.0	0.0
13.11.22	16	25.2	48.1	1.2	4.3	315.0	NW	0.0	0.0
13.11.22	17	25.0	47.8	0.9	3.2	135.0	SE	0.0	0.0
13.11.22	18	24.7	47.1	2.2	7.9	270.0	W	0.0	0.0
13.11.22	19	27.8	47.7	1.2	4.3	135.0	SE	0.0	0.0
13.11.22	20	26.0	48.4	0.9	3.1	315.0	NW	0.0	0.0
13.11.22	21	25.6	48.8	0.4	1.4	315.0	NW	0.0	0.0
13.11.22	22	23.3	49.3	0.5	1.8	315.0	NW	0.0	0.0
13.11.22	23	23.1	49.0	0.2	0.7	315.0	NW	0.0	0.0
13.11.22	24	22.5	50.3	0.5	1.8	270.0	W	0.0	0.0
14.11.22	1	21.1	52.7	0.2	0.6	45.0	NE	0.0	0.0
14.11.22	2	18.4	53.9	0.4	1.4	45.0	NE	0.0	0.0
14.11.22	3	16.1	56.3	1.2	4.3	45.0	NE	0.0	0.0
14.11.22	4	13.6	57.8	0.7	2.5	157.5	SES	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
14.11.22	5	13.1	59.2	1.2	4.3	360.0	N	0.0	0.0
14.11.22	6	13.4	59.7	0.9	3.1	22.5	NNE	0.0	0.0
14.11.22	7	16.3	59.0	1.4	4.9	180.0	S	0.0	0.0
14.11.22	8	19.7	58.5	1.1	4.0	67.5	ENE	0.0	0.0
14.11.22	9	20.6	58.1	1.2	4.3	225.0	SW	0.0	0.0
14.11.22	10	21.6	56.9	1.2	4.3	270.0	W	0.0	0.0
14.11.22	11	23.8	55.7	1.7	6.1	270.0	W	0.0	0.0
14.11.22	12	24.4	53.1	2.2	7.9	270.0	W	0.0	0.0
14.11.22	13	24.8	51.5	2.2	8.0	315.0	NW	0.0	0.0
14.11.22	14	24.5	50.2	2.3	8.3	315.0	NW	0.0	0.0
14.11.22	15	24.2	48.6	2.5	9.0	90.0	E	0.0	0.0
14.11.22	16	24.0	47.5	1.9	6.8	90.0	E	0.0	0.0
14.11.22	17	23.6	46.8	3.7	13.3	337.5	NWN	0.0	0.0
14.11.22	18	23.3	46.1	2.2	8.0	315.0	NW	0.0	0.0
14.11.22	19	23.0	46.7	4.2	15.1	135.0	SE	0.0	0.0
14.11.22	20	22.3	47.3	1.6	5.8	135.0	SE	0.0	0.0
14.11.22	21	21.7	48.8	0.1	0.4	135.0	SE	0.0	0.0
14.11.22	22	20.5	49.4	0.7	2.5	135.0	SE	0.0	0.0
14.11.22	23	19.3	50.2	0.5	1.9	315.0	NW	0.0	0.0
14.11.22	24	18.4	50.7	0.2	0.6	225.0	SW	0.0	0.0
15.11.22	1	17.2	51.5	0.4	1.4	135.0	SE	0.0	0.0
15.11.22	2	15.4	53.6	0.7	2.5	135.0	SE	0.0	0.0
15.11.22	3	14.6	55.2	0.9	3.2	270.0	W	0.0	0.0
15.11.22	4	13.7	57.7	0.2	0.7	270.0	W	0.0	0.0
15.11.22	5	13.3	58.3	0.5	1.8	270.0	W	0.0	0.0
15.11.22	6	13.1	59.9	0.6	2.2	270.0	W	0.0	0.0
15.11.22	7	13.6	59.5	0.7	2.5	315.0	NW	0.0	0.0
15.11.22	8	15.9	58.2	2.2	7.9	135.0	SE	0.0	0.0
15.11.22	9	18.7	57.6	1.4	4.9	135.0	SE	0.0	0.0
15.11.22	10	21.3	55.7	1.2	4.3	270.0	W	0.0	0.0
15.11.22	11	23.6	53.4	1.1	4.0	270.0	W	0.0	0.0
15.11.22	12	24.4	52.8	2.2	7.9	315.0	NW	0.0	0.0
15.11.22	13	24.8	50.8	2.2	7.9	22.5	NNE	0.0	0.0
15.11.22	14	25.1	49.4	2.2	7.9	180.0	S	0.0	0.0
15.11.22	15	25.7	47.8	2.2	7.9	67.5	ENE	0.0	0.0
15.11.22	16	26.0	47.3	2.2	7.9	315.0	NW	0.0	0.0
15.11.22	17	25.4	46.6	2.5	9.0	112.5	ESE	0.0	0.0
15.11.22	18	24.8	46.2	1.2	4.3	247.5	SWW	0.0	0.0
15.11.22	19	24.0	47.5	1.1	4.0	157.5	SES	0.0	0.0
15.11.22	20	23.3	47.9	0.6	2.2	360.0	N	0.0	0.0
15.11.22	21	21.4	48.3	0.5	1.8	225.0	SW	0.0	0.0
15.11.22	22	20.9	48.7	0.4	1.4	270.0	W	0.0	0.0
15.11.22	23	20.3	49.2	0.3	1.1	135.0	SE	0.0	0.0
15.11.22	24	18.4	49.9	0.5	1.8	45.0	NE	0.0	0.0
16.11.22	1	17.3	51.7	0.2	0.7	270.0	W	0.0	0.0
16.11.22	2	17.0	53.8	0.4	1.4	270.0	W	0.0	0.0
16.11.22	3	16.3	55.4	0.5	1.8	315.0	NW	0.0	0.0
16.11.22	4	15.6	58.2	0.7	2.5	337.5	NWN	0.0	0.0
16.11.22	5	14.8	59.6	0.3	1.1	270.0	W	0.0	0.0
16.11.22	6	15.0	60.7	0.9	3.2	270.0	W	0.0	0.0
16.11.22	7	15.2	60.2	1.2	4.3	270.0	W	0.0	0.0
16.11.22	8	17.2	59.7	1.1	4.0	315.0	NW	0.0	0.0
16.11.22	9	17.9	58.6	1.4	5.0	270.0	W	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
16.11.22	10	18.4	56.4	1.8	6.5	270.0	W	0.0	0.0
16.11.22	11	20.5	53.7	1.3	4.7	270.0	W	0.0	0.0
16.11.22	12	22.3	52.1	2.2	8.0	270.0	W	0.0	0.0
16.11.22	13	25.7	50.4	2.6	9.4	315.0	NW	0.0	0.0
16.11.22	14	26.5	48.5	2.2	7.9	315.0	NW	0.0	0.0
16.11.22	15	26.8	47.7	2.2	7.9	315.0	NW	0.0	0.0
16.11.22	16	26.3	47.2	1.9	6.8	315.0	NW	0.0	0.0
16.11.22	17	26.0	46.8	1.4	4.9	315.0	NW	0.0	0.0
16.11.22	18	25.7	47.4	1.4	4.9	270.0	W	0.0	0.0
16.11.22	19	25.4	47.9	1.4	4.9	315.0	NW	0.0	0.0
16.11.22	20	25.0	48.2	0.7	2.5	135.0	SE	0.0	0.0
16.11.22	21	24.2	48.5	0.5	1.8	22.5	NNE	0.0	0.0
16.11.22	22	23.5	49.8	0.3	1.1	180.0	S	0.0	0.0
16.11.22	23	23.0	50.5	0.9	3.1	135.0	SE	0.0	0.0
16.11.22	24	21.7	51.4	0.3	1.1	67.5	ENE	0.0	0.0
17.11.22	1	20.5	53.7	0.2	0.6	202.5	SSW	0.0	0.0
17.11.22	2	18.4	55.5	0.9	3.1	112.5	ESE	0.0	0.0
17.11.22	3	20.3	56.9	1.1	4.0	247.5	SWW	0.0	0.0
17.11.22	4	13.9	58.8	0.5	1.8	157.5	SES	0.0	0.0
17.11.22	5	13.2	61.4	0.3	1.1	360.0	N	0.0	0.0
17.11.22	6	13.8	60.7	1.4	4.9	225.0	SW	0.0	0.0
17.11.22	7	15.1	60.2	1.4	4.9	225.0	SW	0.0	0.0
17.11.22	8	16.1	59.6	0.9	3.1	90.0	E	0.0	0.0
17.11.22	9	17.7	58.6	0.5	1.8	90.0	E	0.0	0.0
17.11.22	10	19.5	58.2	1.7	6.2	337.5	NWN	0.0	0.0
17.11.22	11	21.2	56.2	1.7	6.2	270.0	W	0.0	0.0
17.11.22	12	24.5	53.7	3.7	13.3	135.0	SE	0.0	0.0
17.11.22	13	25.7	51.5	2.2	8.0	315.0	NW	0.0	0.0
17.11.22	14	26.6	50.4	1.9	6.8	315.0	NW	0.0	0.0
17.11.22	15	26.9	48.8	2.2	7.9	315.0	NW	0.0	0.0
17.11.22	16	27.1	47.3	1.9	6.8	315.0	NW	0.0	0.0
17.11.22	17	26.2	46.7	2.2	7.9	315.0	NW	0.0	0.0
17.11.22	18	25.8	46.2	0.5	1.8	315.0	NW	0.0	0.0
17.11.22	19	25.3	46.5	0.7	2.5	135.0	SE	0.0	0.0
17.11.22	20	25.2	46.9	0.5	1.8	225.0	SW	0.0	0.0
17.11.22	21	24.6	47.6	0.5	1.8	270.0	W	0.0	0.0
17.11.22	22	23.2	48.2	0.2	0.7	270.0	W	0.0	0.0
17.11.22	23	22.9	48.9	0.5	1.8	315.0	NW	0.0	0.0
17.11.22	24	20.5	49.7	0.4	1.4	315.0	NW	0.0	0.0
18.11.22	1	18.6	50.9	0.3	1.1	45.0	NE	0.0	0.0
18.11.22	2	15.4	52.4	0.2	0.7	45.0	NE	0.0	0.0
18.11.22	3	13.5	54.8	0.5	1.8	45.0	NE	0.0	0.0
18.11.22	4	13.5	57.9	0.5	1.8	135.0	SE	0.0	0.0
18.11.22	5	13.4	59.3	0.2	0.7	135.0	SE	0.0	0.0
18.11.22	6	13.9	60.2	0.8	2.9	135.0	SE	0.0	0.0
18.11.22	7	14.2	60.0	1.1	4.0	135.0	SE	0.0	0.0
18.11.22	8	15.1	59.4	1.4	5.0	315.0	NW	0.0	0.0
18.11.22	9	16.4	58.5	1.2	4.3	315.0	NW	0.0	0.0
18.11.22	10	18.2	57.6	2.2	7.9	225.0	SW	0.0	0.0
18.11.22	11	20.4	55.7	2.2	7.9	135.0	SE	0.0	0.0
18.11.22	12	23.8	54.1	2.2	7.9	135.0	SE	0.0	0.0
18.11.22	13	25.9	51.8	2.3	8.3	270.0	W	0.0	0.0
18.11.22	14	26.6	50.7	2.2	7.9	270.0	W	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
18.11.22	15	27.1	48.2	3.7	13.3	315.0	NW	0.0	0.0
18.11.22	16	27.3	47.4	2.2	7.9	337.5	NWN	0.0	0.0
18.11.22	17	25.8	47.0	2.2	7.9	90.0	E	0.0	0.0
18.11.22	18	25.3	47.9	2.2	7.9	360.0	N	0.0	0.0
18.11.22	19	25.0	48.3	1.7	6.1	225.0	SW	0.0	0.0
18.11.22	20	24.7	49.1	0.5	1.8	90.0	E	0.0	0.0
18.11.22	21	22.5	49.9	0.5	1.8	135.0	SE	0.0	0.0
18.11.22	22	21.4	50.2	0.1	0.4	225.0	SW	0.0	0.0
18.11.22	23	20.3	50.7	0.5	1.8	135.0	SE	0.0	0.0
18.11.22	24	18.4	51.9	0.2	0.7	135.0	SE	0.0	0.0
19.11.22	1	17.2	53.4	1.4	4.9	135.0	SE	0.0	0.0
19.11.22	2	15.0	54.9	0.3	1.1	135.0	SE	0.0	0.0
19.11.22	3	13.7	56.8	0.1	0.4	135.0	SE	0.0	0.0
19.11.22	4	13.3	59.1	0.4	1.4	315.0	NW	0.0	0.0
19.11.22	5	13.1	60.7	0.5	1.8	315.0	NW	0.0	0.0
19.11.22	6	13.2	61.1	0.5	1.8	315.0	NW	0.0	0.0
19.11.22	7	16.5	60.6	0.7	2.5	270.0	W	0.0	0.0
19.11.22	8	18.5	60.0	1.2	4.3	45.0	NE	0.0	0.0
19.11.22	9	19.2	59.5	0.9	3.1	45.0	NE	0.0	0.0
19.11.22	10	21.6	57.5	1.4	5.0	45.0	NE	0.0	0.0
19.11.22	11	24.3	54.9	2.2	8.0	270.0	W	0.0	0.0
19.11.22	12	25.4	53.3	1.8	6.5	135.0	SE	0.0	0.0
19.11.22	13	25.9	51.7	2.2	7.9	135.0	SE	0.0	0.0
19.11.22	14	26.7	49.6	3.7	13.3	315.0	NW	0.0	0.0
19.11.22	15	26.2	48.1	2.2	7.9	315.0	NW	0.0	0.0
19.11.22	16	25.7	46.6	2.2	7.9	135.0	SE	0.0	0.0
19.11.22	17	25.3	46.2	1.5	5.4	135.0	SE	0.0	0.0
19.11.22	18	24.3	45.8	2.2	7.9	135.0	SE	0.0	0.0
19.11.22	19	23.9	46.4	0.8	2.9	135.0	SE	0.0	0.0
19.11.22	20	22.6	47.4	0.5	1.8	135.0	SE	0.0	0.0
19.11.22	21	22.2	48.2	0.3	1.1	360.0	N	0.0	0.0
19.11.22	22	21.8	49.3	0.2	0.7	225.0	SW	0.0	0.0
19.11.22	23	21.3	50.3	0.1	0.4	225.0	SW	0.0	0.0
19.11.22	24	20.6	51.8	0.7	2.5	90.0	E	0.0	0.0
20.11.22	1	19.8	53.7	0.3	1.1	90.0	E	0.0	0.0
20.11.22	2	18.3	55.6	1.2	4.3	90.0	E	0.0	0.0
20.11.22	3	17.5	57.3	0.5	1.8	337.5	NWN	0.0	0.0
20.11.22	4	15.5	59.7	0.2	0.7	270.0	W	0.0	0.0
20.11.22	5	14.4	60.2	0.9	3.1	270.0	W	0.0	0.0
20.11.22	6	13.4	61.4	0.5	1.8	315.0	NW	0.0	0.0
20.11.22	7	15.3	61.0	0.7	2.5	135.0	SE	0.0	0.0
20.11.22	8	17.4	60.3	2.2	7.9	135.0	SE	0.0	0.0
20.11.22	9	19.9	59.8	1.2	4.3	135.0	SE	0.0	0.0
20.11.22	10	21.5	59.1	1.1	4.0	135.0	SE	0.0	0.0
20.11.22	11	23.4	57.6	2.2	7.9	135.0	SE	0.0	0.0
20.11.22	12	24.2	55.3	1.8	6.5	315.0	NW	0.0	0.0
20.11.22	13	24.9	52.8	2.2	7.9	315.0	NW	0.0	0.0
20.11.22	14	25.4	50.4	2.2	8.0	315.0	NW	0.0	0.0
20.11.22	15	26.8	48.5	2.6	9.4	315.0	NW	0.0	0.0
20.11.22	16	26.3	48.0	2.4	8.6	315.0	NW	0.0	0.0
20.11.22	17	26.0	48.2	2.2	7.9	225.0	SW	0.0	0.0
20.11.22	18	25.7	48.8	1.7	6.2	270.0	W	0.0	0.0
20.11.22	19	25.4	49.6	2.2	7.9	270.0	W	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
20.11.22	20	25.1	50.3	0.6	2.2	270.0	W	0.0	0.0
20.11.22	21	24.6	51.7	0.3	1.1	45.0	NE	0.0	0.0
20.11.22	22	24.0	51.9	0.5	1.8	180.0	S	0.0	0.0
20.11.22	23	23.8	53.2	0.9	3.1	67.5	ENE	0.0	0.0
20.11.22	24	21.0	54.8	0.5	1.8	202.5	SSW	0.0	0.0
21.11.22	1	20.4	55.5	0.4	1.4	135.0	SE	0.0	0.0
21.11.22	2	18.2	57.1	0.3	1.1	247.5	SWW	0.0	0.0
21.11.22	3	16.4	58.7	0.5	1.8	135.0	SE	0.0	0.0
21.11.22	4	14.4	59.3	0.5	1.8	360.0	N	0.0	0.0
21.11.22	5	13.7	60.1	0.6	2.2	225.0	SW	0.0	0.0
21.11.22	6	14.2	59.7	0.8	2.9	225.0	SW	0.0	0.0
21.11.22	7	16.8	58.4	0.9	3.1	90.0	E	0.0	0.0
21.11.22	8	19.5	57.9	1.2	4.3	337.5	NWN	0.0	0.0
21.11.22	9	20.4	57.2	1.1	4.0	270.0	W	0.0	0.0
21.11.22	10	21.7	55.3	1.4	5.0	270.0	W	0.0	0.0
21.11.22	11	23.5	52.8	1.7	6.1	270.0	W	0.0	0.0
21.11.22	12	24.8	51.2	2.2	8.0	135.0	SE	0.0	0.0
21.11.22	13	25.1	50.0	2.2	7.9	315.0	NW	0.0	0.0
21.11.22	14	25.8	49.7	2.6	9.4	315.0	NW	0.0	0.0
21.11.22	15	26.7	49.3	2.6	9.4	315.0	NW	0.0	0.0
21.11.22	16	26.4	49.0	2.2	7.9	315.0	NW	0.0	0.0
21.11.22	17	25.8	49.6	1.2	4.3	315.0	NW	0.0	0.0
21.11.22	18	25.3	50.3	0.8	2.9	315.0	NW	0.0	0.0
21.11.22	19	25.0	51.1	0.9	3.1	135.0	SE	0.0	0.0
21.11.22	20	24.7	51.7	0.2	0.6	315.0	NW	0.0	0.0
21.11.22	21	24.3	52.4	0.7	2.5	315.0	NW	0.0	0.0
21.11.22	22	24.1	52.9	1.1	4.0	315.0	NW	0.0	0.0
21.11.22	23	23.6	53.6	0.1	0.4	45.0	NE	0.0	0.0
21.11.22	24	21.4	54.9	0.2	0.7	45.0	NE	0.0	0.0
22.11.22	1	19.3	55.3	0.3	1.1	45.0	NE	0.0	0.0
22.11.22	2	16.2	57.8	0.7	2.5	135.0	SE	0.0	0.0
22.11.22	3	14.4	59.4	0.1	0.4	135.0	SE	0.0	0.0
22.11.22	4	13.9	60.4	0.3	1.1	22.5	NNE	0.0	0.0
22.11.22	5	13.4	61.3	0.5	1.8	180.0	S	0.0	0.0
22.11.22	6	13.7	61.6	0.8	2.9	67.5	ENE	0.0	0.0
22.11.22	7	16.6	61.1	1.9	6.8	202.5	SSW	0.0	0.0
22.11.22	8	19.5	60.6	1.2	4.3	112.5	ESE	0.0	0.0
22.11.22	9	21.7	59.4	1.4	5.0	247.5	SWW	0.0	0.0
22.11.22	10	23.8	58.8	2.2	7.9	157.5	SES	0.0	0.0
22.11.22	11	26.1	58.2	2.2	7.9	360.0	N	0.0	0.0
22.11.22	12	27.9	57.7	1.9	6.8	225.0	SW	0.0	0.0
22.11.22	13	28.3	56.3	2.3	8.3	90.0	E	0.0	0.0
22.11.22	14	28.4	54.7	2.4	8.6	90.0	E	0.0	0.0
22.11.22	15	29.2	53.1	1.7	6.2	135.0	SE	0.0	0.0
22.11.22	16	28.6	51.6	3.7	13.3	315.0	NW	0.0	0.0
22.11.22	17	28.1	48.9	1.7	6.2	270.0	W	0.0	0.0
22.11.22	18	28.0	47.3	2.6	9.4	315.0	NW	0.0	0.0
22.11.22	19	27.7	46.8	1.3	4.7	135.0	SE	0.0	0.0
22.11.22	20	27.5	47.5	0.7	2.5	270.0	W	0.0	0.0
22.11.22	21	27.1	48.2	0.7	2.5	270.0	W	0.0	0.0
22.11.22	22	25.3	49.4	0.1	0.4	135.0	SE	0.0	0.0
22.11.22	23	24.1	50.8	0.5	1.8	315.0	NW	0.0	0.0
22.11.22	24	23.8	52.6	0.4	1.4	135.0	SE	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
23.11.22	1	23.2	54.8	0.3	1.1	135.0	SE	0.0	0.0
23.11.22	2	21.1	57.9	0.9	3.1	270.0	W	0.0	0.0
23.11.22	3	19.5	58.4	0.5	1.8	270.0	W	0.0	0.0
23.11.22	4	18.5	60.3	0.3	1.1	315.0	NW	0.0	0.0
23.11.22	5	14.4	61.8	0.5	1.8	45.0	NE	0.0	0.0
23.11.22	6	13.6	62.7	0.6	2.2	45.0	NE	0.0	0.0
23.11.22	7	15.2	62.2	0.8	2.9	67.5	ENE	0.0	0.0
23.11.22	8	18.5	61.8	1.1	4.0	202.5	SSW	0.0	0.0
23.11.22	9	20.3	61.3	1.9	6.8	45.0	NE	0.0	0.0
23.11.22	10	22.5	60.4	1.4	5.0	22.5	NNE	0.0	0.0
23.11.22	11	25.7	57.9	1.1	4.0	180.0	S	0.0	0.0
23.11.22	12	27.7	55.2	1.4	5.0	135.0	SE	0.0	0.0
23.11.22	13	29.5	54.1	2.1	7.6	135.0	SE	0.0	0.0
23.11.22	14	28.6	52.5	2.4	8.6	315.0	NW	0.0	0.0
23.11.22	15	28.9	51.3	2.2	7.9	315.0	NW	0.0	0.0
23.11.22	16	28.4	50.7	2.7	9.7	135.0	SE	0.0	0.0
23.11.22	17	30.2	49.3	3.8	13.7	315.0	NW	0.0	0.0
23.11.22	18	29.5	48.6	4.2	15.1	225.0	SW	0.0	0.0
23.11.22	19	29.1	47.3	3.6	13.0	225.0	SW	0.0	0.0
23.11.22	20	28.7	48.1	1.5	5.4	90.0	E	0.0	0.0
23.11.22	21	28.4	48.8	0.8	2.9	90.0	E	0.0	0.0
23.11.22	22	27.9	49.3	1.4	4.9	337.5	NWN	0.0	0.0
23.11.22	23	27.3	49.9	0.2	0.7	112.5	ESE	0.0	0.0
23.11.22	24	25.7	50.5	0.2	0.7	247.5	SWW	0.0	0.0
24.11.22	1	23.2	52.8	0.6	2.2	157.5	SES	0.0	0.0
24.11.22	2	20.4	54.7	0.4	1.4	360.0	N	0.0	0.0
24.11.22	3	17.5	57.3	0.5	1.8	135.0	SE	0.0	0.0
24.11.22	4	15.2	59.4	0.7	2.5	135.0	SE	0.0	0.0
24.11.22	5	15.2	60.4	0.5	1.8	135.0	SE	0.0	0.0
24.11.22	6	15.8	61.1	0.7	2.5	135.0	SE	0.0	0.0
24.11.22	7	16.3	60.7	0.6	2.2	135.0	SE	0.0	0.0
24.11.22	8	17.9	59.4	0.7	2.5	225.0	SW	0.0	0.0
24.11.22	9	19.3	58.7	0.9	3.2	270.0	W	0.0	0.0
24.11.22	10	20.0	56.4	1.1	4.0	270.0	W	0.0	0.0
24.11.22	11	21.6	53.8	1.4	5.0	270.0	W	0.0	0.0
24.11.22	12	23.5	52.1	2.2	8.0	315.0	NW	0.0	0.0
24.11.22	13	26.4	50.4	2.3	8.3	315.0	NW	0.0	0.0
24.11.22	14	28.9	48.7	2.7	9.7	315.0	NW	0.0	0.0
24.11.22	15	29.0	48.2	2.2	7.9	315.0	NW	0.0	0.0
24.11.22	16	28.4	47.7	1.3	4.7	315.0	NW	0.0	0.0
24.11.22	17	28.0	47.5	1.4	4.9	315.0	NW	0.0	0.0
24.11.22	18	27.8	47.9	0.8	2.9	22.5	NNE	0.0	0.0
24.11.22	19	27.4	48.4	0.6	2.2	180.0	S	0.0	0.0
24.11.22	20	27.0	49.1	0.1	0.4	67.5	ENE	0.0	0.0
24.11.22	21	26.5	49.8	0.2	0.7	202.5	SSW	0.0	0.0
24.11.22	22	26.0	50.7	0.4	1.4	112.5	ESE	0.0	0.0
24.11.22	23	25.5	52.7	0.2	0.7	247.5	SWW	0.0	0.0
24.11.22	24	25.0	53.9	0.5	1.8	157.5	SES	0.0	0.0
25.11.22	1	23.7	55.2	0.3	1.1	360.0	N	0.0	0.0
25.11.22	2	21.5	57.5	0.9	3.1	225.0	SW	0.0	0.0
25.11.22	3	20.8	58.4	0.2	0.7	225.0	SW	0.0	0.0
25.11.22	4	17.3	59.9	0.3	1.1	90.0	E	0.0	0.0
25.11.22	5	14.2	60.7	0.5	1.8	90.0	E	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
25.11.22	6	13.5	61.0	0.5	1.8	337.5	NWN	0.0	0.0
25.11.22	7	16.4	60.2	0.7	2.5	270.0	W	0.0	0.0
25.11.22	8	18.7	59.8	0.9	3.2	135.0	SE	0.0	0.0
25.11.22	9	21.7	59.2	1.2	4.3	135.0	SE	0.0	0.0
25.11.22	10	23.9	57.4	1.4	5.0	225.0	SW	0.0	0.0
25.11.22	11	25.8	55.4	2.2	8.0	135.0	SE	0.0	0.0
25.11.22	12	27.9	54.3	1.8	6.5	135.0	SE	0.0	0.0
25.11.22	13	28.8	52.8	2.2	7.9	315.0	NW	0.0	0.0
25.11.22	14	28.9	51.3	2.3	8.3	315.0	NW	0.0	0.0
25.11.22	15	28.4	49.6	2.6	9.4	315.0	NW	0.0	0.0
25.11.22	16	28.1	47.2	1.3	4.7	315.0	NW	0.0	0.0
25.11.22	17	27.7	46.8	4.2	15.1	315.0	NW	0.0	0.0
25.11.22	18	27.3	46.3	1.6	5.8	315.0	NW	0.0	0.0
25.11.22	19	27.4	46.9	0.9	3.2	135.0	SE	0.0	0.0
25.11.22	20	27.0	47.4	0.6	2.2	45.0	NE	0.0	0.0
25.11.22	21	26.7	48.2	0.2	0.7	45.0	NE	0.0	0.0
25.11.22	22	25.3	48.8	0.4	1.4	135.0	SE	0.0	0.0
25.11.22	23	23.8	49.5	0.1	0.4	225.0	SW	0.0	0.0
25.11.22	24	23.3	51.8	0.2	0.7	22.5	NNE	0.0	0.0
26.11.22	1	21.8	53.5	0.3	1.1	22.5	NNE	0.0	0.0
26.11.22	2	19.4	54.6	1.2	4.3	180.0	S	0.0	0.0
26.11.22	3	16.2	56.2	0.9	3.1	67.5	ENE	0.0	0.0
26.11.22	4	14.7	58.7	0.4	1.4	202.5	SSW	0.0	0.0
26.11.22	5	13.6	59.2	1.4	4.9	112.5	ESE	0.0	0.0
26.11.22	6	15.2	60.2	0.9	3.1	247.5	SWW	0.0	0.0
26.11.22	7	16.9	59.7	1.2	4.3	157.5	SES	0.0	0.0
26.11.22	8	17.8	57.4	0.5	1.8	360.0	N	0.0	0.0
26.11.22	9	20.4	54.6	0.7	2.5	225.0	SW	0.0	0.0
26.11.22	10	21.7	52.9	0.6	2.2	202.5	SSW	0.0	0.0
26.11.22	11	24.8	51.4	1.3	4.7	202.5	SSW	0.0	0.0
26.11.22	12	27.3	50.3	2.2	7.9	337.5	NWN	0.0	0.0
26.11.22	13	28.8	47.7	2.2	7.9	225.0	SW	0.0	0.0
26.11.22	14	29.0	45.5	2.7	9.7	45.0	NE	0.0	0.0
26.11.22	15	28.4	43.9	1.5	5.4	315.0	NW	0.0	0.0
26.11.22	16	28.0	44.0	0.6	2.2	45.0	NE	0.0	0.0
26.11.22	17	27.7	44.3	1.4	4.9	45.0	NE	0.0	0.0
26.11.22	18	27.4	43.6	0.5	1.8	112.5	ESE	0.0	0.0
26.11.22	19	27.0	43.9	2.2	7.9	247.5	SWW	0.0	0.0
26.11.22	20	26.5	45.0	0.7	2.5	157.5	SES	0.0	0.0
26.11.22	21	26.2	44.4	0.1	0.4	360.0	N	0.0	0.0
26.11.22	22	25.6	45.5	0.2	0.7	225.0	SW	0.0	0.0
26.11.22	23	24.7	47.9	0.9	3.1	202.5	SSW	0.0	0.0
26.11.22	24	22.4	48.0	0.1	0.4	337.5	NWN	0.0	0.0
27.11.22	1	20.6	49.5	0.2	0.6	22.5	NNE	0.0	0.0
27.11.22	2	19.1	52.8	0.9	3.1	180.0	S	0.0	0.0
27.11.22	3	18.4	56.3	0.9	3.1	60.0	ENE	0.0	0.0
27.11.22	4	16.5	58.6	0.4	1.4	67.5	ENE	0.0	0.0
27.11.22	5	14.8	59.2	0.5	1.8	202.5	SSW	0.0	0.0
27.11.22	6	13.7	60.4	1.4	4.9	135.0	SE	0.0	0.0
27.11.22	7	14.9	59.9	1.4	4.9	270.0	W	0.0	0.0
27.11.22	8	15.3	57.3	0.6	2.2	270.0	W	0.0	0.0
27.11.22	9	16.4	52.5	0.6	2.2	270.0	W	0.0	0.0
27.11.22	10	17.9	51.4	1.7	6.2	270.0	W	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
27.11.22	11	20.5	49.7	1.7	6.2	270.0	W	0.0	0.0
27.11.22	12	23.7	47.0	2.1	7.6	270.0	W	0.0	0.0
27.11.22	13	26.9	45.6	2.2	8.0	315.0	NW	0.0	0.0
27.11.22	14	27.8	45.3	2.6	9.4	315.0	NW	0.0	0.0
27.11.22	15	28.2	43.7	2.3	8.3	135.0	SE	0.0	0.0
27.11.22	16	28.5	45.0	1.9	6.8	315.0	NW	0.0	0.0
27.11.22	17	27.9	44.2	1.4	5.0	270.0	W	0.0	0.0
27.11.22	18	27.0	46.8	1.7	6.1	270.0	W	0.0	0.0
27.11.22	19	26.4	48.5	1.5	5.4	135.0	SE	0.0	0.0
27.11.22	20	26.1	51.2	0.1	0.4	135.0	SE	0.0	0.0
27.11.22	21	25.0	50.3	0.2	0.7	135.0	SE	0.0	0.0
27.11.22	22	24.3	51.6	0.2	0.7	225.0	SW	0.0	0.0
27.11.22	23	23.1	52.6	0.2	0.7	270.0	W	0.0	0.0
27.11.22	24	21.3	53.5	0.2	0.7	270.0	W	0.0	0.0
28.11.22	1	19.2	55.3	0.3	1.1	270.0	W	0.0	0.0
28.11.22	2	17.5	55.7	0.3	1.1	270.0	W	0.0	0.0
28.11.22	3	15.3	53.9	0.4	1.4	135.0	SE	0.0	0.0
28.11.22	4	14.6	58.4	1.3	4.7	135.0	SE	0.0	0.0
28.11.22	5	13.7	59.3	0.9	3.1	135.0	SE	0.0	0.0
28.11.22	6	13.8	57.6	1.2	4.3	135.0	SE	0.0	0.0
28.11.22	7	14.9	56.3	0.5	1.8	135.0	SE	0.0	0.0
28.11.22	8	16.5	54.7	0.7	2.5	270.0	W	0.0	0.0
28.11.22	9	18.4	53.8	0.7	2.5	315.0	NW	0.0	0.0
28.11.22	10	20.5	50.6	2.2	7.9	315.0	NW	0.0	0.0
28.11.22	11	23.7	52.9	2.6	9.4	270.0	W	0.0	0.0
28.11.22	12	25.8	49.5	2.3	8.3	270.0	W	0.0	0.0
28.11.22	13	26.4	46.4	1.3	4.7	315.0	NW	0.0	0.0
28.11.22	14	26.9	44.4	0.9	3.2	270.0	W	0.0	0.0
28.11.22	15	26.6	44.6	2.4	8.6	315.0	NW	0.0	0.0
28.11.22	16	26.1	45.5	1.1	4.0	315.0	NW	0.0	0.0
28.11.22	17	25.7	43.6	2.7	9.7	315.0	NW	0.0	0.0
28.11.22	18	25.5	43.6	1.4	5.0	22.5	NNE	0.0	0.0
28.11.22	19	25.5	43.9	1.9	6.8	180.0	S	0.0	0.0
28.11.22	20	25.0	43.9	0.6	2.2	67.5	ENE	0.0	0.0
28.11.22	21	24.8	46.8	0.9	3.1	202.5	SSW	0.0	0.0
28.11.22	22	24.3	46.8	0.1	0.4	112.5	ESE	0.0	0.0
28.11.22	23	24.0	49.3	0.5	1.8	247.5	SWW	0.0	0.0
28.11.22	24	23.2	50.2	0.4	1.4	157.5	SES	0.0	0.0
29.11.22	1	21.4	51.9	0.4	1.4	360.0	N	0.0	0.0
29.11.22	2	18.4	53.5	0.9	3.1	225.0	SW	0.0	0.0
29.11.22	3	16.2	56.5	0.3	1.1	202.5	SSW	0.0	0.0
29.11.22	4	14.2	58.0	1.2	4.3	337.5	NWN	0.0	0.0
29.11.22	5	13.6	59.3	0.5	1.8	90.0	E	0.0	0.0
29.11.22	6	16.5	58.2	1.2	4.3	135.0	SE	0.0	0.0
29.11.22	7	17.2	57.6	0.7	2.5	135.0	SE	0.0	0.0
29.11.22	8	17.8	56.3	1.2	4.3	135.0	SE	0.0	0.0
29.11.22	9	18.9	54.7	1.1	4.0	315.0	NW	0.0	0.0
29.11.22	10	20.3	54.0	2.2	7.9	315.0	NW	0.0	0.0
29.11.22	11	23.0	53.8	1.4	5.0	270.0	W	0.0	0.0
29.11.22	12	26.8	53.5	2.2	7.9	270.0	W	0.0	0.0
29.11.22	13	27.9	51.5	2.2	7.9	270.0	W	0.0	0.0
29.11.22	14	28.0	49.7	2.2	7.9	315.0	NW	0.0	0.0
29.11.22	15	27.6	47.5	2.7	9.7	315.0	NW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
29.11.22	16	27.3	45.2	3.7	13.3	315.0	NW	0.0	0.0
29.11.22	17	27.0	45.0	4.2	15.1	270.0	W	0.0	0.0
29.11.22	18	26.2	45.4	2.1	7.6	270.0	W	0.0	0.0
29.11.22	19	25.1	45.8	1.2	4.3	315.0	NW	0.0	0.0
29.11.22	20	24.3	47.0	0.7	2.5	135.0	SE	0.0	0.0
29.11.22	21	23.6	46.5	0.1	0.4	270.0	W	0.0	0.0
29.11.22	22	22.8	48.2	0.2	0.6	45.0	NE	0.0	0.0
29.11.22	23	22.1	48.5	0.2	0.7	45.0	NE	0.0	0.0
29.11.22	24	21.4	48.0	0.6	2.2	45.0	NE	0.0	0.0
30.11.22	1	20.0	49.1	0.2	0.7	135.0	SE	0.0	0.0
30.11.22	2	18.7	48.9	0.4	1.4	135.0	SE	0.0	0.0
30.11.22	3	17.1	50.6	0.2	0.6	22.5	NNE	0.0	0.0
30.11.22	4	15.3	52.1	0.4	1.4	180.0	S	0.0	0.0
30.11.22	5	13.7	55.8	0.9	3.1	67.5	ENE	0.0	0.0
30.11.22	6	14.6	53.7	1.2	4.3	202.5	SSW	0.0	0.0
30.11.22	7	16.1	54.3	0.6	2.2	112.5	ESE	0.0	0.0
30.11.22	8	17.2	53.5	1.1	4.0	247.5	SWW	0.0	0.0
30.11.22	9	18.4	52.0	1.9	6.8	360.0	N	0.0	0.0
30.11.22	10	20.5	48.7	2.2	8.0	157.5	SES	0.0	0.0
30.11.22	11	22.4	46.2	2.2	7.9	225.0	SW	0.0	0.0
30.11.22	12	25.6	43.8	0.8	2.9	202.5	SSW	0.0	0.0
30.11.22	13	26.7	44.0	2.2	7.9	90.0	E	0.0	0.0
30.11.22	14	27.3	43.9	1.7	6.1	360.0	N	0.0	0.0
30.11.22	15	27.8	43.6	1.9	6.8	337.5	NWN	0.0	0.0
30.11.22	16	27.4	45.0	2.1	7.6	270.0	W	0.0	0.0
30.11.22	17	27.0	43.6	1.3	4.7	270.0	W	0.0	0.0
30.11.22	18	26.7	45.1	0.8	2.9	270.0	W	0.0	0.0
30.11.22	19	26.3	45.8	1.2	4.3	270.0	W	0.0	0.0
30.11.22	20	25.3	46.5	0.6	2.2	135.0	SE	0.0	0.0
30.11.22	21	24.3	47.2	0.9	3.1	202.5	SSW	0.0	0.0
30.11.22	22	23.1	48.5	0.7	2.5	112.5	ESE	0.0	0.0
30.11.22	23	22.7	49.0	0.2	0.7	247.5	SWW	0.0	0.0
30.11.22	24	21.2	50.3	0.5	1.8	157.5	SES	0.0	0.0
12.1.22	1	20.3	52.5	0.9	3.3	135.0	SE	0.0	0.0
12.1.22	2	18.6	54.6	0.9	3.1	45.0	NE	0.0	0.0
12.1.22	3	16.6	56.2	0.3	1.1	45.0	NE	0.0	0.0
12.1.22	4	14.7	56.7	0.2	0.8	157.5	SES	0.0	0.0
12.1.22	5	13.6	57.4	1.2	4.3	315.0	NW	0.0	0.0
12.1.22	6	14.5	56.9	0.6	2.2	225.0	SW	0.0	0.0
12.1.22	7	15.7	56.0	0.7	2.5	315.0	NW	0.0	0.0
12.1.22	8	17.1	54.6	1.3	4.7	225.0	SW	0.0	0.0
12.1.22	9	18.8	54.1	2.2	7.9	270.0	W	0.0	0.0
12.1.22	10	20.4	53.3	1.6	5.8	67.5	ENE	0.0	0.0
12.1.22	11	23.1	50.0	2.4	8.6	135.0	SE	0.0	0.0
12.1.22	12	25.2	48.3	1.1	4.0	270.0	W	0.0	0.0
12.1.22	13	26.4	47.6	2.2	7.8	315.0	NW	0.0	0.0
12.1.22	14	26.9	47.0	2.7	9.7	315.0	NW	0.0	0.0
12.1.22	15	27.0	46.7	1.3	4.7	315.0	NW	0.0	0.0
12.1.22	16	26.6	46.4	1.1	4.0	315.0	NW	0.0	0.0
12.1.22	17	26.3	47.3	1.4	5.0	315.0	NW	0.0	0.0
12.1.22	18	25.3	46.8	4.2	15.1	135.0	SE	0.0	0.0
12.1.22	19	24.7	47.9	1.1	4.0	202.5	SSW	0.0	0.0
12.1.22	20	23.6	48.4	0.7	2.4	22.5	NNE	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
12.1.22	21	23.2	48.9	1.3	4.7	270.0	W	0.0	0.0
12.1.22	22	22.1	49.6	0.2	0.8	247.5	SWW	0.0	0.0
12.1.22	23	20.5	50.2	1.1	3.9	225.0	SW	0.0	0.0
12.1.22	24	19.0	51.4	0.7	2.4	292.5	WNW	0.0	0.0
12.2.22	1	17.7	53.3	1.7	6.3	45.0	NE	0.0	0.0
12.2.22	2	16.3	55.6	1.1	4.0	45.0	NE	0.0	0.0
12.2.22	3	14.7	58.3	0.7	2.4	45.0	NE	0.0	0.0
12.2.22	4	13.8	59.2	0.7	2.4	157.5	SES	0.0	0.0
12.2.22	5	13.5	58.7	1.1	3.9	45.0	NE	0.0	0.0
12.2.22	6	14.9	56.6	0.6	2.2	270.0	W	0.0	0.0
12.2.22	7	16.7	57.9	1.1	3.9	180.0	S	0.0	0.0
12.2.22	8	18.9	56.4	1.4	5.0	225.0	SW	0.0	0.0
12.2.22	9	20.6	55.2	1.7	6.1	112.5	ESE	0.0	0.0
12.2.22	10	22.7	52.8	1.1	4.0	270.0	W	0.0	0.0
12.2.22	11	25.1	51.4	2.3	8.3	270.0	W	0.0	0.0
12.2.22	12	26.7	49.7	4.2	15.1	270.0	W	0.0	0.0
12.2.22	13	27.3	47.3	2.4	8.6	315.0	NW	0.0	0.0
12.2.22	14	27.7	46.8	1.8	6.5	315.0	NW	0.0	0.0
12.2.22	15	28.3	44.9	2.7	9.7	315.0	NW	0.0	0.0
12.2.22	16	28.8	45.7	2.2	7.9	315.0	NW	0.0	0.0
12.2.22	17	28.2	45.3	2.3	8.3	135.0	SE	0.0	0.0
12.2.22	18	26.9	45.8	2.2	7.9	315.0	NW	0.0	0.0
12.2.22	19	26.2	46.4	0.7	2.5	315.0	NW	0.0	0.0
12.2.22	20	24.7	46.6	1.1	3.9	210.0	SSW	0.0	0.0
12.2.22	21	23.7	47.5	0.5	1.8	22.5	NNE	0.0	0.0
12.2.22	22	22.8	48.8	0.7	2.4	22.5	NNE	0.0	0.0
12.2.22	23	21.6	49.3	1.3	4.7	247.5	SWW	0.0	0.0
12.2.22	24	20.6	49.9	1.3	4.7	247.5	SWW	0.0	0.0
12.3.22	1	19.7	51.2	0.2	0.8	225.0	SW	0.0	0.0
12.3.22	2	19.1	53.8	0.5	1.8	225.0	SW	0.0	0.0
12.3.22	3	17.2	56.2	0.1	0.4	225.0	SW	0.0	0.0
12.3.22	4	15.0	56.9	0.5	1.8	292.5	WNW	0.0	0.0
12.3.22	5	15.5	54.2	0.5	1.8	292.5	WNW	0.0	0.0
12.3.22	6	17.2	57.8	0.5	1.8	180.0	S	0.0	0.0
12.3.22	7	19.2	55.5	1.7	6.3	45.0	NE	0.0	0.0
12.3.22	8	21.6	54.9	2.0	7.2	315.0	NW	0.0	0.0
12.3.22	9	23.2	52.1	0.6	2.2	360.0	N	0.0	0.0
12.3.22	10	24.7	50.7	1.1	4.0	157.5	SES	0.0	0.0
12.3.22	11	25.3	48.3	1.3	4.7	270.0	W	0.0	0.0
12.3.22	12	26.4	47.9	1.4	5.0	315.0	NW	0.0	0.0
12.3.22	13	27.0	47.0	2.2	7.9	315.0	NW	0.0	0.0
12.3.22	14	27.2	46.8	1.6	5.8	270.0	W	0.0	0.0
12.3.22	15	26.7	46.4	2.3	8.3	315.0	NW	0.0	0.0
12.3.22	16	26.3	46.1	1.2	4.3	135.0	SE	0.0	0.0
12.3.22	17	26.0	45.7	1.3	4.7	315.0	NW	0.0	0.0
12.3.22	18	24.4	45.5	1.2	4.3	315.0	NW	0.0	0.0
12.3.22	19	23.2	45.9	0.9	3.1	225.0	SW	0.0	0.0
12.3.22	20	21.7	46.6	1.3	4.7	22.5	NNE	0.0	0.0
12.3.22	21	20.6	48.2	0.4	1.4	45.0	NE	0.0	0.0
12.3.22	22	20.1	47.3	0.7	2.4	315.0	NW	0.0	0.0
12.3.22	23	19.7	48.6	0.7	2.4	315.0	NW	0.0	0.0
12.3.22	24	19.2	49.6	0.2	0.8	112.5	ESE	0.0	0.0
12.4.22	1	18.1	50.1	0.5	1.8	135.0	SE	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
12.4.22	2	16.6	53.8	0.9	3.1	202.5	SSW	0.0	0.0
12.4.22	3	15.2	54.5	0.9	3.1	22.5	NNE	0.0	0.0
12.4.22	4	14.3	56.7	1.7	6.3	270.0	W	0.0	0.0
12.4.22	5	12.9	58.3	0.7	2.4	315.0	NW	0.0	0.0
12.4.22	6	13.8	57.9	0.5	1.8	67.5	ENE	0.0	0.0
12.4.22	7	15.3	57.2	0.7	2.4	45.0	NE	0.0	0.0
12.4.22	8	17.2	56.5	1.3	4.7	45.0	NE	0.0	0.0
12.4.22	9	18.5	55.9	1.7	6.3	180.0	S	0.0	0.0
12.4.22	10	21.7	53.6	1.1	3.9	225.0	SW	0.0	0.0
12.4.22	11	24.5	51.7	2.1	7.6	225.0	SW	0.0	0.0
12.4.22	12	25.8	50.4	1.3	4.7	315.0	NW	0.0	0.0
12.4.22	13	26.4	48.9	1.6	5.8	315.0	NW	0.0	0.0
12.4.22	14	26.8	48.2	2.3	8.3	315.0	NW	0.0	0.0
12.4.22	15	26.5	46.2	2.2	7.9	270.0	W	0.0	0.0
12.4.22	16	26.1	44.8	2.3	8.3	315.0	NW	0.0	0.0
12.4.22	17	25.7	46.9	1.1	4.0	315.0	NW	0.0	0.0
12.4.22	18	24.3	46.9	0.7	2.5	270.0	W	0.0	0.0
12.4.22	19	22.4	42.6	0.5	1.8	135.0	SE	0.0	0.0
12.4.22	20	21.6	43.1	0.2	0.7	202.5	SSW	0.0	0.0
12.4.22	21	20.6	45.9	0.9	3.1	210.0	SSW	0.0	0.0
12.4.22	22	19.2	46.6	1.1	3.9	22.5	NNE	0.0	0.0
12.4.22	23	16.8	47.0	0.3	1.1	22.5	NNE	0.0	0.0
12.4.22	24	15.2	48.2	0.5	1.8	247.5	SWW	0.0	0.0
12.5.22	1	13.7	49.3	1.1	3.9	247.5	SWW	0.0	0.0
12.5.22	2	12.1	50.5	0.4	1.4	225.0	SW	0.0	0.0
12.5.22	3	11.2	52.7	0.9	3.1	225.0	SW	0.0	0.0
12.5.22	4	9.4	55.3	0.5	1.8	292.5	WNW	0.0	0.0
12.5.22	5	9.1	58.9	1.7	6.3	315.0	NW	0.0	0.0
12.5.22	6	11.1	59.2	0.5	1.8	270.0	W	0.0	0.0
12.5.22	7	12.9	59.0	1.1	3.9	45.0	NE	0.0	0.0
12.5.22	8	14.7	58.5	1.3	4.7	315.0	NW	0.0	0.0
12.5.22	9	16.2	57.9	0.5	1.8	225.0	SW	0.0	0.0
12.5.22	10	18.3	57.0	1.2	4.3	270.0	W	0.0	0.0
12.5.22	11	20.7	55.3	0.6	2.2	270.0	W	0.0	0.0
12.5.22	12	22.8	53.1	0.9	3.1	270.0	W	0.0	0.0
12.5.22	13	24.1	50.6	2.7	9.7	270.0	W	0.0	0.0
12.5.22	14	25.4	48.7	1.3	4.7	270.0	W	0.0	0.0
12.5.22	15	25.3	47.2	2.1	7.6	360.0	N	0.0	0.0
12.5.22	16	24.7	45.8	0.5	1.8	315.0	NW	0.0	0.0
12.5.22	17	24.2	42.7	1.6	5.8	270.0	W	0.0	0.0
12.5.22	18	23.1	43.9	2.2	7.9	270.0	W	0.0	0.0
12.5.22	19	22.2	46.7	0.7	2.5	67.5	ENE	0.0	0.0
12.5.22	20	21.0	47.3	1.1	3.9	180.0	S	0.0	0.0
12.5.22	21	19.3	48.5	0.5	1.8	202.5	SSW	0.0	0.0
12.5.22	22	17.7	49.2	0.2	0.7	22.5	NNE	0.0	0.0
12.5.22	23	16.2	50.5	1.3	4.7	247.5	SWW	0.0	0.0
12.5.22	24	14.6	52.7	0.2	0.7	225.0	SW	0.0	0.0
12.6.22	1	13.3	51.6	0.3	1.1	202.5	SSW	0.0	0.0
12.6.22	2	11.9	52.9	0.4	1.4	210.0	SSW	0.0	0.0
12.6.22	3	10.2	54.4	0.5	1.8	270.0	W	0.0	0.0
12.6.22	4	8.9	57.6	0.9	3.1	22.5	NNE	0.0	0.0
12.6.22	5	8.2	59.3	0.2	0.7	247.5	SWW	0.0	0.0
12.6.22	6	10.4	59.1	0.5	1.8	247.5	SWW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
12.6.22	7	13.3	58.5	0.5	1.8	225.0	SW	0.0	0.0
12.6.22	8	15.5	57.8	1.6	5.8	225.0	SW	0.0	0.0
12.6.22	9	17.6	57.2	0.6	2.2	135.0	SE	0.0	0.0
12.6.22	10	19.9	56.4	1.1	4.0	225.0	SW	0.0	0.0
12.6.22	11	22.6	54.8	0.7	2.5	67.5	ENE	0.0	0.0
12.6.22	12	24.5	54.0	1.4	5.0	112.5	ESE	0.0	0.0
12.6.22	13	24.7	58.3	2.6	9.4	270.0	W	0.0	0.0
12.6.22	14	24.8	62.8	4.2	15.1	270.0	W	0.0	0.0
12.6.22	15	25.2	68.4	2.2	7.9	157.5	SES	0.0	0.0
12.6.22	16	25.0	64.3	0.9	3.2	315.0	NW	0.0	0.0
12.6.22	17	23.1	70.2	2.2	7.9	45.0	NE	0.0	0.0
12.6.22	18	20.2	68.4	0.5	1.8	45.0	NE	0.0	0.0
12.6.22	19	18.6	60.0	1.3	4.7	45.0	NE	0.0	0.0
12.6.22	20	17.1	55.5	1.3	4.7	315.0	NW	0.0	0.0
12.6.22	21	16.3	71.3	0.2	0.7	315.0	NW	0.0	0.0
12.6.22	22	15.1	69.3	0.7	2.4	315.0	NW	0.0	0.0
12.6.22	23	13.6	69.3	0.7	2.4	45.0	NE	0.0	0.0
12.6.22	24	13.2	66.3	0.3	1.1	45.0	NE	0.0	0.0
12.7.22	1	12.6	64.5	0.2	0.8	225.0	SW	0.0	0.0
12.7.22	2	11.6	68.2	0.9	3.1	225.0	SW	0.0	0.0
12.7.22	3	10.4	62.2	0.9	3.1	292.5	WNW	0.0	0.0
12.7.22	4	9.9	65.4	1.7	6.3	225.0	SW	0.0	0.0
12.7.22	5	9.4	66.4	0.7	2.4	45.0	NE	0.0	0.0
12.7.22	6	11.1	73.7	1.3	4.7	45.0	NE	0.0	0.0
12.7.22	7	13.6	68.4	0.7	2.4	45.0	NE	0.0	0.0
12.7.22	8	15.8	65.3	0.8	2.9	135.0	SE	0.0	0.0
12.7.22	9	17.8	62.7	1.7	6.3	225.0	SW	0.0	0.0
12.7.22	10	20.1	58.3	1.1	3.9	360.0	N	0.0	0.0
12.7.22	11	22.1	54.2	1.4	5.0	270.0	W	0.0	0.0
12.7.22	12	23.8	51.8	1.3	4.7	270.0	W	0.0	0.0
12.7.22	13	25.6	49.7	2.3	8.3	270.0	W	0.0	0.0
12.7.22	14	26.1	48.2	2.3	8.3	67.5	ENE	0.0	0.0
12.7.22	15	25.7	47.8	2.2	7.9	270.0	W	0.0	0.0
12.7.22	16	25.2	47.3	2.2	7.9	270.0	W	0.0	0.0
12.7.22	17	24.9	46.9	2.2	7.9	270.0	W	0.0	0.0
12.7.22	18	23.7	46.5	1.2	4.3	90.0	E	0.0	0.0
12.7.22	19	22.4	46.0	2.2	8.1	315.0	NW	0.0	0.0
12.7.22	20	21.3	46.7	2.2	7.9	270.0	W	0.0	0.0
12.7.22	21	20.2	47.4	0.4	1.4	315.0	NW	0.0	0.0
12.7.22	22	18.8	47.9	0.1	0.4	315.0	NW	0.0	0.0
12.7.22	23	18.2	48.6	0.4	1.4	112.5	ESE	0.0	0.0
12.7.22	24	16.7	49.3	0.1	0.4	315.0	NW	0.0	0.0
12.8.22	1	15.6	51.7	0.6	2.2	157.5	SES	0.0	0.0
12.8.22	2	14.4	52.8	0.3	1.1	180.0	S	0.0	0.0
12.8.22	3	13.3	55.7	0.9	3.1	202.5	SSW	0.0	0.0
12.8.22	4	12.4	57.3	0.4	1.4	22.5	NNE	0.0	0.0
12.8.22	5	11.6	57.4	1.7	6.3	247.5	SWW	0.0	0.0
12.8.22	6	13.1	58.0	0.5	1.8	247.5	SWW	0.0	0.0
12.8.22	7	15.2	57.7	0.5	1.8	225.0	SW	0.0	0.0
12.8.22	8	17.1	56.3	2.2	7.9	225.0	SW	0.0	0.0
12.8.22	9	18.6	54.2	0.9	3.1	292.5	WNW	0.0	0.0
12.8.22	10	20.4	52.7	0.5	1.8	90.0	E	0.0	0.0
12.8.22	11	22.6	50.2	0.6	2.2	292.5	WNW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
12.8.22	12	24.3	48.4	1.7	6.1	45.0	NE	0.0	0.0
12.8.22	13	25.7	47.3	2.2	7.9	45.0	NE	0.0	0.0
12.8.22	14	26.3	45.6	2.1	7.6	270.0	W	0.0	0.0
12.8.22	15	26.6	45.2	2.7	9.7	270.0	W	0.0	0.0
12.8.22	16	27.1	44.7	1.4	5.0	45.0	NE	0.0	0.0
12.8.22	17	25.8	45.4	1.7	6.3	270.0	W	0.0	0.0
12.8.22	18	24.7	46.2	1.3	4.7	315.0	NW	0.0	0.0
12.8.22	19	23.4	46.9	1.7	6.3	45.0	NE	0.0	0.0
12.8.22	20	22.2	47.4	0.9	3.1	112.5	ESE	0.0	0.0
12.8.22	21	21.3	48.6	0.2	0.7	67.5	ENE	0.0	0.0
12.8.22	22	19.8	48.9	0.2	0.7	315.0	NW	0.0	0.0
12.8.22	23	18.7	49.5	0.4	1.4	225.0	SW	0.0	0.0
12.8.22	24	17.7	51.7	0.2	0.7	157.5	SES	0.0	0.0
12.9.22	1	16.6	53.6	0.3	1.1	180.0	S	0.0	0.0
12.9.22	2	15.2	56.2	1.1	3.9	135.0	SE	0.0	0.0
12.9.22	3	13.6	58.3	1.1	3.9	202.5	SSW	0.0	0.0
12.9.22	4	11.7	59.9	0.7	2.4	22.5	NNE	0.0	0.0
12.9.22	5	11.2	61.5	0.5	1.8	247.5	SWW	0.0	0.0
12.9.22	6	13.2	63.0	1.7	6.3	247.5	SWW	0.0	0.0
12.9.22	7	15.1	62.3	1.7	6.3	225.0	SW	0.0	0.0
12.9.22	8	16.2	61.1	1.6	5.8	315.0	NW	0.0	0.0
12.9.22	9	17.8	60.3	2.2	7.9	315.0	NW	0.0	0.0
12.9.22	10	20.4	59.8	2.2	7.9	270.0	W	0.0	0.0
12.9.22	11	22.0	57.6	2.2	7.9	270.0	W	0.0	0.0
12.9.22	12	24.4	54.3	2.2	7.9	67.5	ENE	0.0	0.0
12.9.22	13	25.1	53.7	2.2	7.9	315.0	NW	0.0	0.0
12.9.22	14	25.5	51.4	2.6	9.4	270.0	W	0.0	0.0
12.9.22	15	26.2	49.6	0.7	2.5	45.0	NE	0.0	0.0
12.9.22	16	26.7	48.3	0.6	2.2	45.0	NE	0.0	0.0
12.9.22	17	25.7	47.7	2.2	7.9	45.0	NE	0.0	0.0
12.9.22	18	24.2	47.3	1.3	4.7	270.0	W	0.0	0.0
12.9.22	19	23.1	47.8	0.7	2.5	67.5	ENE	0.0	0.0
12.9.22	20	21.4	48.4	0.4	1.4	112.5	ESE	0.0	0.0
12.9.22	21	20.6	48.9	0.3	1.1	157.5	SES	0.0	0.0
12.9.22	22	19.3	49.7	0.1	0.4	202.5	SSW	0.0	0.0
12.9.22	23	17.8	51.8	0.7	2.4	135.0	SE	0.0	0.0
12.9.22	24	16.6	52.5	0.4	1.4	22.5	NNE	0.0	0.0
12.10.22	1	15.4	54.7	0.2	0.8	22.5	NNE	0.0	0.0
12.10.22	2	13.1	56.2	0.2	0.8	247.5	SWW	0.0	0.0
12.10.22	3	12.8	58.6	0.3	1.1	247.5	SWW	0.0	0.0
12.10.22	4	12.1	59.4	0.9	3.1	225.0	SW	0.0	0.0
12.10.22	5	11.7	60.4	1.1	3.9	135.0	SE	0.0	0.0
12.10.22	6	12.8	61.7	0.5	1.8	292.5	WNW	0.0	0.0
12.10.22	7	14.7	61.3	0.7	2.4	45.0	NE	0.0	0.0
12.10.22	8	16.6	60.8	0.9	3.1	315.0	NW	0.0	0.0
12.10.22	9	19.1	58.2	0.7	2.5	45.0	NE	0.0	0.0
12.10.22	10	20.9	55.3	1.2	4.3	270.0	W	0.0	0.0
12.10.22	11	22.5	53.7	1.1	4.0	315.0	NW	0.0	0.0
12.10.22	12	23.6	51.3	2.2	7.9	67.5	ENE	0.0	0.0
12.10.22	13	24.2	50.3	1.2	4.3	270.0	W	0.0	0.0
12.10.22	14	24.8	48.6	2.3	8.3	45.0	NE	0.0	0.0
12.10.22	15	25.0	48.1	1.1	4.0	270.0	W	0.0	0.0
12.10.22	16	24.5	47.6	2.2	7.9	270.0	W	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
12.10.22	17	24.2	46.9	2.2	7.9	315.0	NW	0.0	0.0
12.10.22	18	23.4	47.2	3.7	13.3	45.0	NE	0.0	0.0
12.10.22	19	22.2	47.8	2.2	7.9	270.0	W	0.0	0.0
12.10.22	20	20.7	48.9	0.5	1.8	67.5	ENE	0.0	0.0
12.10.22	21	19.6	50.2	0.3	1.1	112.5	ESE	0.0	0.0
12.10.22	22	17.8	51.7	0.1	0.4	157.5	SES	0.0	0.0
12.10.22	23	16.7	53.3	0.2	0.7	135.0	SE	0.0	0.0
12.10.22	24	15.8	54.4	0.7	2.4	135.0	SE	0.0	0.0
12.11.22	1	14.6	56.9	0.4	1.4	202.5	SSW	0.0	0.0
12.11.22	2	13.2	58.8	0.3	1.1	210.0	SSW	0.0	0.0
12.11.22	3	12.3	60.3	0.2	0.7	22.5	NNE	0.0	0.0
12.11.22	4	11.7	61.8	0.3	1.1	247.5	SWW	0.0	0.0
12.11.22	5	11.4	62.2	0.5	1.8	225.0	SW	0.0	0.0
12.11.22	6	11.1	63.5	0.7	2.5	225.0	SW	0.0	0.0
12.11.22	7	10.7	62.7	0.9	3.1	270.0	W	0.0	0.0
12.11.22	8	13.1	58.8	0.5	1.8	45.0	NE	0.0	0.0
12.11.22	9	15.7	57.7	0.7	2.5	360.0	N	0.0	0.0
12.11.22	10	17.6	54.8	1.6	5.8	337.5	NWN	0.0	0.0
12.11.22	11	20.2	52.6	1.1	4.0	315.0	NW	0.0	0.0
12.11.22	12	22.5	51.1	2.2	7.8	315.0	NW	0.0	0.0
12.11.22	13	24.4	49.6	2.4	8.6	270.0	W	0.0	0.0
12.11.22	14	24.9	47.0	2.2	7.9	67.5	ENE	0.0	0.0
12.11.22	15	24.4	45.2	2.6	9.4	270.0	W	0.0	0.0
12.11.22	16	24.0	45.1	2.1	7.6	270.0	W	0.0	0.0
12.11.22	17	23.7	44.6	1.1	4.0	270.0	W	0.0	0.0
12.11.22	18	22.4	44.2	2.2	7.9	45.0	NE	0.0	0.0
12.11.22	19	21.3	45.8	2.2	7.8	135.0	SE	0.0	0.0
12.11.22	20	20.2	46.3	0.9	3.1	180.0	S	0.0	0.0
12.11.22	21	19.4	46.1	0.2	0.7	45.0	NE	0.0	0.0
12.11.22	22	17.7	47.0	0.3	1.1	112.5	ESE	0.0	0.0
12.11.22	23	16.6	48.5	0.1	0.4	157.5	SES	0.0	0.0
12.11.22	24	15.7	49.5	0.9	3.1	135.0	SE	0.0	0.0
12.12.22	1	14.3	52.0	0.9	3.1	225.0	SW	0.0	0.0
12.12.22	2	13.2	54.4	0.4	1.4	202.5	SSW	0.0	0.0
12.12.22	3	12.2	55.7	0.2	0.7	210.0	SSW	0.0	0.0
12.12.22	4	11.1	57.3	0.5	1.8	22.5	NNE	0.0	0.0
12.12.22	5	10.4	58.8	0.5	1.8	22.5	NNE	0.0	0.0
12.12.22	6	11.8	60.0	0.7	2.4	247.5	SWW	0.0	0.0
12.12.22	7	14.3	58.5	0.5	1.8	247.5	SWW	0.0	0.0
12.12.22	8	16.2	58.1	0.7	2.5	67.5	ENE	0.0	0.0
12.12.22	9	18.4	56.7	2.2	7.9	180.0	S	0.0	0.0
12.12.22	10	21.3	55.3	0.5	1.8	135.0	SE	0.0	0.0
12.12.22	11	22.9	52.7	2.2	7.9	315.0	NW	0.0	0.0
12.12.22	12	24.4	50.2	2.2	7.9	270.0	W	0.0	0.0
12.12.22	13	24.6	48.7	1.2	4.3	337.5	NWN	0.0	0.0
12.12.22	14	24.8	46.9	2.2	7.9	270.0	W	0.0	0.0
12.12.22	15	25.2	46.4	0.8	2.9	270.0	W	0.0	0.0
12.12.22	16	24.4	45.9	0.5	1.8	270.0	W	0.0	0.0
12.12.22	17	23.7	45.5	2.2	7.9	270.0	W	0.0	0.0
12.12.22	18	23.2	45.1	2.2	7.8	270.0	W	0.0	0.0
12.12.22	19	21.6	47.0	1.1	3.9	45.0	NE	0.0	0.0
12.12.22	20	20.4	49.0	1.3	4.7	270.0	W	0.0	0.0
12.12.22	21	19.1	52.5	0.2	0.7	315.0	NW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
12.12.22	22	18.3	55.0	0.3	1.1	135.0	SE	0.0	0.0
12.12.22	23	16.7	56.0	0.2	0.7	315.0	NW	0.0	0.0
12.12.22	24	16.2	58.5	0.7	2.4	360.0	N	2.0	0.0
13.12.22	1	14.7	63.0	0.1	0.4	157.5	SES	2.0	0.0
13.12.22	2	14.2	65.0	0.2	0.7	157.5	SES	2.0	0.0
13.12.22	3	13.3	68.0	0.5	1.8	135.0	SE	2.0	0.0
13.12.22	4	12.2	69.0	0.4	1.4	180.0	S	2.0	0.0
13.12.22	5	11.6	73.0	0.5	1.8	202.5	SSW	3.0	0.0
13.12.22	6	13.1	74.0	0.6	2.2	22.5	NNE	4.0	0.0
13.12.22	7	14.7	75.0	1.1	3.9	22.5	NNE	5.0	0.0
13.12.22	8	16.6	73.0	1.1	3.9	247.5	SWW	4.0	0.0
13.12.22	9	19.2	77.0	0.9	3.2	247.5	SWW	0.0	0.0
13.12.22	10	21.6	72.5	1.2	4.3	247.5	SWW	4.0	0.0
13.12.22	11	23.6	70.6	1.3	4.7	135.0	SE	4.0	0.0
13.12.22	12	24.6	68.5	1.3	4.7	135.0	SE	0.0	0.0
13.12.22	13	25.3	63.5	2.2	7.9	270.0	W	0.0	0.0
13.12.22	14	25.9	61.0	2.4	8.6	270.0	W	0.0	0.0
13.12.22	15	26.1	60.5	0.5	1.8	135.0	SE	0.0	0.0
13.12.22	16	26.4	58.4	0.6	2.2	315.0	NW	0.0	0.0
13.12.22	17	25.3	57.5	1.1	4.0	270.0	W	0.0	0.0
13.12.22	18	24.2	55.0	0.9	3.2	270.0	W	0.0	0.0
13.12.22	19	22.6	54.5	2.2	7.9	157.5	SES	0.0	0.0
13.12.22	20	21.3	58.4	0.5	1.8	112.5	ESE	0.0	0.0
13.12.22	21	19.9	56.0	0.5	1.8	360.0	N	0.0	0.0
13.12.22	22	18.6	55.5	0.2	0.7	135.0	SE	0.0	0.0
13.12.22	23	17.4	54.5	0.4	1.4	202.5	SSW	0.0	0.0
13.12.22	24	16.3	53.5	0.3	1.1	225.0	SW	0.0	0.0
14.12.22	1	15.1	55.0	0.2	0.7	225.0	SW	0.0	0.0
14.12.22	2	13.7	56.7	0.5	1.8	225.0	SW	0.0	0.0
14.12.22	3	12.6	56.6	0.2	0.7	292.5	WNW	0.0	0.0
14.12.22	4	11.7	60.5	0.5	1.8	45.0	NE	0.0	0.0
14.12.22	5	10.3	62.5	0.5	1.8	270.0	W	0.0	0.0
14.12.22	6	12.2	63.0	0.5	1.8	360.0	N	0.0	0.0
14.12.22	7	14.1	66.5	0.5	1.8	67.5	ENE	0.0	0.0
14.12.22	8	16.4	68.5	1.6	5.8	135.0	SE	0.0	0.0
14.12.22	9	18.8	70.5	0.6	2.2	270.0	W	0.0	0.0
14.12.22	10	21.2	72.0	0.7	2.5	45.0	NE	0.0	0.0
14.12.22	11	23.2	74.5	0.9	3.1	270.0	W	4.0	0.0
14.12.22	12	24.7	76.5	1.3	4.8	315.0	NW	4.0	0.0
14.12.22	13	25.2	77.0	2.5	9.0	270.0	W	5.0	0.0
14.12.22	14	25.6	79.5	2.2	7.8	270.0	W	6.0	0.0
14.12.22	15	26.1	80.5	2.2	7.8	270.0	W	7.0	0.2
14.12.22	16	26.6	81.0	2.2	7.9	315.0	NW	7.0	0.4
14.12.22	17	25.0	80.5	2.2	7.8	315.0	NW	7.0	0.0
14.12.22	18	24.3	77.9	3.7	13.3	315.0	NW	6.0	0.0
14.12.22	19	21.7	75.5	1.3	4.7	135.0	SE	5.0	0.0
14.12.22	20	18.0	73.5	0.7	2.4	45.0	NE	4.0	0.0
14.12.22	21	16.6	71.5	0.9	3.1	112.5	ESE	3.0	0.0
14.12.22	22	15.5	69.6	0.2	0.7	67.5	ENE	2.0	0.0
14.12.22	23	14.3	67.5	0.1	0.4	112.5	ESE	0.0	0.0
14.12.22	24	14.0	66.0	0.3	1.1	360.0	N	0.0	0.0
15.12.22	1	13.6	68.0	0.2	0.7	360.0	N	0.0	0.0
15.12.22	2	13.2	69.5	1.1	3.9	157.5	SES	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
15.12.22	3	12.8	70.5	0.3	1.1	210.0	SSW	0.0	0.0
15.12.22	4	12.4	72.0	0.4	1.4	247.5	SWW	0.0	0.0
15.12.22	5	11.0	74.5	0.5	1.8	202.5	SSW	2.0	0.0
15.12.22	6	10.7	76.5	0.5	1.8	22.5	NNE	3.0	0.0
15.12.22	7	12.9	78.0	0.5	1.8	22.5	NNE	4.0	0.0
15.12.22	8	15.4	79.5	0.6	2.2	180.0	S	5.0	0.3
15.12.22	9	17.1	81.5	0.9	3.2	180.0	S	7.0	1.1
15.12.22	10	20.2	82.5	3.7	13.3	270.0	W	8.0	1.6
15.12.22	11	21.8	80.7	1.2	4.3	270.0	W	7.0	0.4
15.12.22	12	23.5	78.0	1.6	5.8	270.0	W	6.0	0.0
15.12.22	13	24.2	76.0	2.2	7.9	270.0	W	6.0	0.0
15.12.22	14	24.7	74.5	3.7	13.3	270.0	W	4.0	0.0
15.12.22	15	25.1	72.5	2.4	8.6	45.0	NE	4.0	0.0
15.12.22	16	25.6	77.0	1.4	5.0	45.0	NE	3.0	0.0
15.12.22	17	24.2	79.0	0.8	2.9	45.0	NE	2.0	0.0
15.12.22	18	23.3	83.0	0.6	2.2	337.5	NWN	7.0	0.3
15.12.22	19	22.1	84.5	0.5	1.8	315.0	NW	8.0	1.8
15.12.22	20	20.7	81.5	1.3	4.7	315.0	NW	8.0	0.5
15.12.22	21	19.4	79.6	0.9	3.1	315.0	NW	7.0	0.0
15.12.22	22	17.7	77.9	0.4	1.4	45.0	NE	6.0	0.0
15.12.22	23	16.7	75.5	1.1	3.9	270.0	W	4.0	0.0
15.12.22	24	15.6	73.5	0.2	0.7	315.0	NW	3.0	0.0
16.12.22	1	14.5	71.3	0.4	1.4	315.0	NW	2.0	0.0
16.12.22	2	13.8	70.0	0.7	2.4	67.5	ENE	0.0	0.0
16.12.22	3	13.2	68.5	0.2	0.8	135.0	SE	0.0	0.0
16.12.22	4	12.2	66.5	0.9	3.1	45.0	NE	0.0	0.0
16.12.22	5	11.6	64.5	1.7	6.3	135.0	SE	0.0	0.0
16.12.22	6	12.8	63.5	0.9	3.1	135.0	SE	0.0	0.0
16.12.22	7	14.7	63.1	1.3	4.7	112.5	ESE	0.0	0.0
16.12.22	8	17.3	62.0	0.9	3.2	135.0	SE	0.0	0.0
16.12.22	9	20.4	60.2	1.2	4.3	157.5	SES	0.0	0.0
16.12.22	10	22.1	57.9	0.5	1.8	90.0	E	0.0	0.0
16.12.22	11	24.2	55.2	1.7	6.1	135.0	SE	0.0	0.0
16.12.22	12	25.3	53.4	2.4	8.6	45.0	NE	0.0	0.0
16.12.22	13	25.8	52.7	2.4	8.6	202.5	SSW	0.0	0.0
16.12.22	14	25.9	50.4	1.1	4.0	270.0	W	0.0	0.0
16.12.22	15	25.4	49.0	3.8	13.7	315.0	NW	0.0	0.0
16.12.22	16	25.0	47.8	3.7	13.3	315.0	NW	0.0	0.0
16.12.22	17	24.2	48.5	2.2	7.9	315.0	NW	0.0	0.0
16.12.22	18	23.1	49.4	1.3	4.7	315.0	NW	0.0	0.0
16.12.22	19	21.7	50.8	0.8	2.9	270.0	W	0.0	0.0
16.12.22	20	20.6	52.2	1.1	3.9	45.0	NE	0.0	0.0
16.12.22	21	19.7	53.7	1.7	6.3	225.0	SW	0.0	0.0
16.12.22	22	17.6	54.6	1.3	4.7	225.0	SW	0.0	0.0
16.12.22	23	16.6	56.3	0.7	2.4	292.5	WNW	0.0	0.0
16.12.22	24	15.4	58.8	0.7	2.4	45.0	NE	0.0	0.0
17.12.22	1	14.6	59.4	0.4	1.4	247.5	SWW	0.0	0.0
17.12.22	2	13.6	60.3	1.1	3.9	337.5	NWN	0.0	0.0
17.12.22	3	12.4	62.7	0.4	1.4	337.5	NWN	0.0	0.0
17.12.22	4	11.8	63.0	0.4	1.4	45.0	NE	0.0	0.0
17.12.22	5	11.3	63.8	1.3	4.7	270.0	W	0.0	0.0
17.12.22	6	12.7	63.5	0.5	1.8	112.5	ESE	0.0	0.0
17.12.22	7	14.3	62.1	1.3	4.7	45.0	NE	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
17.12.22	8	16.1	60.5	0.6	2.2	135.0	SE	0.0	0.0
17.12.22	9	18.2	59.2	1.1	4.0	135.0	SE	0.0	0.0
17.12.22	10	20.4	57.7	2.2	7.9	135.0	SE	0.0	0.0
17.12.22	11	22.1	55.2	0.9	3.2	270.0	W	0.0	0.0
17.12.22	12	23.8	53.0	1.3	4.7	270.0	W	0.0	0.0
17.12.22	13	24.6	51.5	2.2	7.9	315.0	NW	0.0	0.0
17.12.22	14	24.8	49.8	1.3	4.7	45.0	NE	0.0	0.0
17.12.22	15	25.1	48.4	2.1	7.6	45.0	NE	0.0	0.0
17.12.22	16	25.6	46.2	2.2	7.9	315.0	NW	0.0	0.0
17.12.22	17	24.3	45.4	1.3	4.7	270.0	W	0.0	0.0
17.12.22	18	23.2	45.9	2.2	7.9	135.0	SE	0.0	0.0
17.12.22	19	21.4	46.3	1.3	4.7	180.0	S	0.0	0.0
17.12.22	20	20.3	46.8	1.3	4.7	202.5	SSW	0.0	0.0
17.12.22	21	18.8	48.3	0.7	2.4	22.5	NNE	0.0	0.0
17.12.22	22	17.6	49.6	0.2	0.7	157.5	SES	0.0	0.0
17.12.22	23	16.7	50.4	0.4	1.4	247.5	SWW	0.0	0.0
17.12.22	24	16.2	52.4	0.9	3.1	225.0	SW	0.0	0.0
18.12.22	1	15.2	53.9	0.3	1.1	135.0	SE	0.0	0.0
18.12.22	2	14.6	55.0	0.3	1.1	45.0	NE	0.0	0.0
18.12.22	3	13.4	57.4	1.1	3.9	337.5	NWN	0.0	0.0
18.12.22	4	12.2	59.5	0.1	0.4	315.0	NW	0.0	0.0
18.12.22	5	11.7	61.6	1.7	6.3	270.0	W	0.0	0.0
18.12.22	6	11.3	62.2	1.1	3.9	225.0	SW	0.0	0.0
18.12.22	7	14.7	61.6	0.5	1.8	225.0	SW	0.0	0.0
18.12.22	8	17.3	60.4	2.2	7.9	45.0	NE	0.0	0.0
18.12.22	9	20.8	58.4	0.9	3.1	270.0	W	0.0	0.0
18.12.22	10	22.3	56.3	2.2	7.9	337.5	NWN	0.0	0.0
18.12.22	11	23.3	55.0	2.2	7.9	360.0	N	0.0	0.0
18.12.22	12	23.8	52.7	1.2	4.3	292.5	WNW	0.0	0.0
18.12.22	13	24.6	50.5	2.2	7.9	270.0	W	0.0	0.0
18.12.22	14	24.9	48.7	3.7	13.3	270.0	W	0.0	0.0
18.12.22	15	25.0	45.5	2.4	8.6	270.0	W	0.0	0.0
18.12.22	16	24.6	43.8	2.3	8.3	270.0	W	0.0	0.0
18.12.22	17	24.4	43.2	1.7	6.3	270.0	W	0.0	0.0
18.12.22	18	24.2	43.7	1.7	6.3	270.0	W	0.0	0.0
18.12.22	19	23.2	44.6	2.7	9.7	135.0	SE	0.0	0.0
18.12.22	20	22.1	46.9	1.3	4.7	270.0	W	0.0	0.0
18.12.22	21	20.8	48.3	0.1	0.4	270.0	W	0.0	0.0
18.12.22	22	19.7	50.3	0.2	0.7	292.5	WNW	0.0	0.0
18.12.22	23	19.1	53.3	0.3	1.1	292.5	WNW	0.0	0.0
18.12.22	24	18.2	55.7	0.3	1.1	112.5	ESE	0.0	0.0
19.12.22	1	17.4	56.9	0.2	0.8	360.0	N	0.0	0.0
19.12.22	2	16.5	58.4	1.1	3.9	135.0	SE	0.0	0.0
19.12.22	3	14.2	60.4	1.1	3.9	315.0	NW	0.0	0.0
19.12.22	4	13.4	61.7	1.4	5.2	225.0	SW	0.0	0.0
19.12.22	5	11.3	62.5	0.5	1.8	292.5	WNW	0.0	0.0
19.12.22	6	12.7	63.0	0.5	1.8	315.0	NW	0.0	0.0
19.12.22	7	14.6	62.4	1.1	4.0	135.0	SE	0.0	0.0
19.12.22	8	17.1	61.8	1.6	5.8	135.0	SE	0.0	0.0
19.12.22	9	19.3	59.4	0.9	3.2	180.0	S	0.0	0.0
19.12.22	10	21.4	57.2	1.1	4.0	45.0	NE	0.0	0.0
19.12.22	11	22.9	56.1	1.1	4.0	135.0	SE	0.0	0.0
19.12.22	12	24.4	54.7	2.2	7.8	315.0	NW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
19.12.22	13	25.7	53.0	2.4	8.6	270.0	W	0.0	0.0
19.12.22	14	26.2	50.7	2.2	7.9	270.0	W	0.0	0.0
19.12.22	15	26.8	48.3	2.2	7.9	270.0	W	0.0	0.0
19.12.22	16	26.3	46.4	2.2	7.9	315.0	NW	0.0	0.0
19.12.22	17	25.0	44.9	2.2	7.9	247.5	SWW	0.0	0.0
19.12.22	18	24.2	44.3	1.1	4.0	225.0	SW	0.0	0.0
19.12.22	19	22.4	43.8	1.8	6.5	225.0	SW	0.0	0.0
19.12.22	20	21.3	44.6	0.4	1.4	135.0	SE	0.0	0.0
19.12.22	21	19.7	46.8	0.2	0.7	225.0	SW	0.0	0.0
19.12.22	22	18.8	48.2	0.1	0.4	225.0	SW	0.0	0.0
19.12.22	23	17.4	49.7	0.7	2.4	292.5	WNW	0.0	0.0
19.12.22	24	16.8	51.3	0.4	1.4	292.5	WNW	0.0	0.0
20.12.22	1	16.2	53.6	0.2	0.7	337.5	NWN	0.0	0.0
20.12.22	2	15.3	56.1	1.1	3.9	337.5	NWN	0.0	0.0
20.12.22	3	13.4	58.2	0.2	0.7	270.0	W	0.0	0.0
20.12.22	4	12.2	59.8	0.2	0.7	45.0	NE	0.0	0.0
20.12.22	5	12.5	61.4	1.3	4.7	270.0	W	0.0	0.0
20.12.22	6	13.2	62.0	0.5	1.8	67.5	ENE	0.0	0.0
20.12.22	7	14.7	61.5	1.3	4.7	180.0	S	0.0	0.0
20.12.22	8	17.3	59.8	0.5	1.8	135.0	SE	0.0	0.0
20.12.22	9	20.8	57.4	0.8	2.9	225.0	SW	0.0	0.0
20.12.22	10	22.3	55.2	1.2	4.3	45.0	NE	0.0	0.0
20.12.22	11	24.7	53.5	1.6	5.8	315.0	NW	0.0	0.0
20.12.22	12	25.3	50.5	1.9	6.8	315.0	NW	0.0	0.0
20.12.22	13	25.8	48.7	2.3	8.3	315.0	NW	0.0	0.0
20.12.22	14	25.9	47.3	2.6	9.4	270.0	W	0.0	0.0
20.12.22	15	25.4	45.8	1.5	5.4	270.0	W	0.0	0.0
20.12.22	16	25.0	44.2	1.1	4.0	270.0	W	0.0	0.0
20.12.22	17	23.7	44.6	2.6	9.4	270.0	W	0.0	0.0
20.12.22	18	22.6	45.5	2.2	7.9	337.5	NWN	0.0	0.0
20.12.22	19	21.1	47.2	1.3	4.7	225.0	SW	0.0	0.0
20.12.22	20	19.7	48.7	1.3	4.7	247.5	SWW	0.0	0.0
20.12.22	21	19.2	49.2	0.7	2.4	225.0	SW	0.0	0.0
20.12.22	22	17.8	49.8	0.1	0.4	292.5	WNW	0.0	0.0
20.12.22	23	17.2	50.7	0.4	1.4	112.5	ESE	0.0	0.0
20.12.22	24	16.6	52.4	0.9	3.1	180.0	S	0.0	0.0
21.12.22	1	15.7	53.8	0.4	1.4	157.5	SES	0.0	0.0
21.12.22	2	15.2	55.2	0.6	2.2	210.0	SSW	0.0	0.0
21.12.22	3	14.2	56.7	1.1	3.9	247.5	SWW	0.0	0.0
21.12.22	4	13.4	57.3	0.3	1.1	292.5	WNW	0.0	0.0
21.12.22	5	11.3	58.8	0.5	1.8	135.0	SE	0.0	0.0
21.12.22	6	12.7	60.5	1.1	3.9	135.0	SE	0.0	0.0
21.12.22	7	14.2	57.8	0.6	2.2	202.5	SSW	0.0	0.0
21.12.22	8	16.6	56.3	0.8	2.9	180.0	S	0.0	0.0
21.12.22	9	18.8	56.2	1.9	6.9	22.5	NNE	0.0	0.0
21.12.22	10	21.6	54.4	1.1	4.0	225.0	SW	0.0	0.0
21.12.22	11	23.2	52.1	2.2	7.9	45.0	NE	0.0	0.0
21.12.22	12	24.6	50.7	1.6	5.8	135.0	SE	0.0	0.0
21.12.22	13	25.2	48.9	2.2	7.9	315.0	NW	0.0	0.0
21.12.22	14	25.6	48.2	2.3	8.3	270.0	W	0.0	0.0
21.12.22	15	26.2	45.5	2.3	8.3	270.0	W	0.0	0.0
21.12.22	16	26.6	44.2	2.2	7.9	315.0	NW	0.0	0.0
21.12.22	17	25.3	46.7	1.7	6.3	315.0	NW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
21.12.22	18	24.1	47.7	2.1	7.6	315.0	NW	0.0	0.0
21.12.22	19	22.4	48.4	1.7	6.3	90.0	E	0.0	0.0
21.12.22	20	20.7	49.1	0.9	3.1	135.0	SE	0.0	0.0
21.12.22	21	19.2	49.8	0.1	0.4	112.5	ESE	0.0	0.0
21.12.22	22	17.7	50.4	0.2	0.7	315.0	NW	0.0	0.0
21.12.22	23	16.6	50.7	1.1	3.9	292.5	WNW	0.0	0.0
21.12.22	24	15.4	50.9	0.2	0.7	157.5	SES	0.0	0.0
22.12.22	1	14.7	51.7	0.2	0.8	135.0	SE	0.0	0.0
22.12.22	2	13.6	54.8	1.1	3.9	225.0	SW	0.0	0.0
22.12.22	3	12.7	57.3	0.2	0.7	202.5	SSW	0.0	0.0
22.12.22	4	12.2	60.2	0.7	2.4	270.0	W	0.0	0.0
22.12.22	5	11.7	62.7	0.5	1.8	247.5	SWW	0.0	0.0
22.12.22	6	13.2	63.3	1.7	6.3	225.0	SW	0.0	0.0
22.12.22	7	15.2	63.1	2.1	7.6	22.5	NNE	0.0	0.0
22.12.22	8	17.4	62.7	1.1	3.9	225.0	SW	0.0	0.0
22.12.22	9	19.1	69.4	0.6	2.2	135.0	SE	0.0	0.0
22.12.22	10	21.4	58.2	2.2	7.8	45.0	NE	0.0	0.0
22.12.22	11	22.9	56.5	2.2	7.8	45.0	NE	0.0	0.0
22.12.22	12	24.4	53.2	2.2	7.8	45.0	NE	0.0	0.0
22.12.22	13	24.6	50.9	1.1	4.0	315.0	NW	0.0	0.0
22.12.22	14	25.7	48.6	2.2	7.9	315.0	NW	0.0	0.0
22.12.22	15	26.8	47.3	2.3	8.3	270.0	W	0.0	0.0
22.12.22	16	25.0	46.8	1.9	6.8	270.0	W	0.0	0.0
22.12.22	17	24.2	46.2	2.2	7.9	315.0	NW	0.0	0.0
22.12.22	18	23.1	43.8	1.3	4.7	270.0	W	0.0	0.0
22.12.22	19	21.3	44.3	0.5	1.8	135.0	SE	0.0	0.0
22.12.22	20	20.1	44.8	0.2	0.7	45.0	NE	0.0	0.0
22.12.22	21	18.7	45.5	0.2	0.7	270.0	W	0.0	0.0
22.12.22	22	17.4	45.7	0.5	1.8	67.5	ENE	0.0	0.0
22.12.22	23	16.7	47.2	0.7	2.4	135.0	SE	0.0	0.0
22.12.22	24	15.5	49.3	0.4	1.4	135.0	SE	0.0	0.0
23.12.22	1	14.3	50.9	0.2	0.8	225.0	SW	0.0	0.0
23.12.22	2	13.7	52.5	0.2	0.8	157.5	SES	0.0	0.0
23.12.22	3	12.4	55.8	0.2	0.7	135.0	SE	0.0	0.0
23.12.22	4	11.6	57.6	0.9	3.1	202.5	SSW	0.0	0.0
23.12.22	5	11.1	59.3	1.1	3.9	210.0	SSW	0.0	0.0
23.12.22	6	12.9	61.3	0.5	1.8	22.5	NNE	0.0	0.0
23.12.22	7	15.2	60.6	0.7	2.4	22.5	NNE	0.0	0.0
23.12.22	8	17.7	60.1	0.9	3.1	135.0	SE	0.0	0.0
23.12.22	9	20.2	58.6	2.2	7.9	22.5	NNE	0.0	0.0
23.12.22	10	22.2	57.2	2.2	7.9	270.0	W	0.0	0.0
23.12.22	11	23.2	55.4	2.2	7.9	225.0	SW	0.0	0.0
23.12.22	12	23.6	52.7	0.7	2.5	45.0	NE	0.0	0.0
23.12.22	13	24.1	50.6	2.2	7.9	337.5	NWN	0.0	0.0
23.12.22	14	24.5	47.3	3.7	13.5	270.0	W	0.0	0.0
23.12.22	15	24.8	42.7	2.2	7.9	315.0	NW	0.0	0.0
23.12.22	16	24.5	46.7	2.2	7.9	270.0	W	0.0	0.0
23.12.22	17	24.2	46.7	2.2	7.9	270.0	W	0.0	0.0
23.12.22	18	24.1	43.6	2.4	8.6	270.0	W	0.0	0.0
23.12.22	19	22.6	45.0	1.1	4.0	315.0	NW	0.0	0.0
23.12.22	20	21.1	47.4	0.7	2.5	135.0	SE	0.0	0.0
23.12.22	21	19.6	46.9	1.1	3.9	112.5	ESE	0.0	0.0
23.12.22	22	18.2	47.3	0.2	0.7	135.0	SE	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
23.12.22	23	16.8	49.2	0.1	0.4	135.0	SE	0.0	0.0
23.12.22	24	16.2	50.8	0.7	2.4	157.5	SES	0.0	0.0
24.12.22	1	15.7	52.4	0.2	0.7	135.0	SE	0.0	0.0
24.12.22	2	15.2	53.7	0.1	0.4	202.5	SSW	0.0	0.0
24.12.22	3	14.3	56.9	0.2	0.7	22.5	NNE	0.0	0.0
24.12.22	4	13.7	60.5	0.2	0.7	22.5	NNE	0.0	0.0
24.12.22	5	13.3	62.1	1.3	4.7	247.5	SWW	0.0	0.0
24.12.22	6	12.8	63.7	0.5	1.8	247.5	SWW	0.0	0.0
24.12.22	7	14.1	63.4	0.9	3.1	225.0	SW	0.0	0.0
24.12.22	8	16.2	62.8	0.5	1.8	225.0	SW	0.0	0.0
24.12.22	9	17.9	60.4	1.1	3.9	225.0	SW	0.0	0.0
24.12.22	10	20.3	58.5	0.9	3.2	270.0	W	0.0	0.0
24.12.22	11	22.2	55.2	2.3	8.3	135.0	SE	0.0	0.0
24.12.22	12	23.2	53.8	3.7	13.3	270.0	W	0.0	0.0
24.12.22	13	23.6	52.0	2.1	7.6	270.0	W	0.0	0.0
24.12.22	14	23.8	50.7	2.2	7.8	315.0	NW	0.0	0.0
24.12.22	15	23.9	48.3	4.2	15.1	270.0	W	0.0	0.0
24.12.22	16	23.5	47.2	2.4	8.6	270.0	W	0.0	0.0
24.12.22	17	23.0	45.6	1.3	4.7	270.0	W	0.0	0.0
24.12.22	18	22.1	44.2	0.7	2.5	270.0	W	0.0	0.0
24.12.22	19	20.4	44.9	0.5	1.8	270.0	W	0.0	0.0
24.12.22	20	19.8	45.5	0.1	0.4	202.5	SSW	0.0	0.0
24.12.22	21	19.2	47.8	0.2	0.8	45.0	NE	0.0	0.0
24.12.22	22	18.3	48.3	0.2	0.8	270.0	W	0.0	0.0
24.12.22	23	17.6	50.7	0.1	0.4	67.5	ENE	0.0	0.0
24.12.22	24	16.7	53.3	0.2	0.7	112.5	ESE	0.0	0.0
25.12.22	1	15.8	55.6	0.4	1.4	135.0	SE	0.0	0.0
25.12.22	2	15.3	56.9	0.2	0.8	157.5	SES	0.0	0.0
25.12.22	3	14.4	59.2	0.2	0.8	157.5	SES	0.0	0.0
25.12.22	4	13.9	60.4	0.2	0.8	135.0	SE	0.0	0.0
25.12.22	5	13.4	62.6	0.5	1.8	202.5	SSW	0.0	0.0
25.12.22	6	12.8	63.5	0.5	1.8	22.5	NNE	0.0	0.0
25.12.22	7	13.5	62.9	0.6	2.2	247.5	SWW	0.0	0.0
25.12.22	8	15.7	60.4	1.1	4.0	247.5	SWW	0.0	0.0
25.12.22	9	18.2	58.4	1.2	4.3	247.5	SWW	0.0	0.0
25.12.22	10	20.6	56.2	0.9	3.2	225.0	SW	0.0	0.0
25.12.22	11	22.2	52.7	2.2	7.9	225.0	SW	0.0	0.0
25.12.22	12	23.8	48.9	1.1	4.0	135.0	SE	0.0	0.0
25.12.22	13	24.0	46.7	2.3	8.3	270.0	W	0.0	0.0
25.12.22	14	24.0	45.0	1.2	4.3	270.0	W	0.0	0.0
25.12.22	15	23.8	43.8	3.7	13.3	45.0	NE	0.0	0.0
25.12.22	16	23.5	43.2	1.4	5.0	315.0	NW	0.0	0.0
25.12.22	17	23.3	42.6	1.1	4.0	315.0	NW	0.0	0.0
25.12.22	18	23.2	42.8	1.1	4.0	315.0	NW	0.0	0.0
25.12.22	19	22.7	43.0	1.4	5.0	315.0	NW	0.0	0.0
25.12.22	20	21.4	44.6	1.1	4.0	292.5	WNW	0.0	0.0
25.12.22	21	20.4	44.9	1.1	3.9	292.5	WNW	0.0	0.0
25.12.22	22	19.8	45.3	0.9	3.1	225.0	SW	0.0	0.0
25.12.22	23	19.3	47.7	1.3	4.7	225.0	SW	0.0	0.0
25.12.22	24	18.2	49.2	0.3	1.1	292.5	WNW	0.0	0.0
26.12.22	1	16.7	52.8	0.5	1.8	270.0	W	0.0	0.0
26.12.22	2	16.2	55.4	0.9	3.1	45.0	NE	0.0	0.0
26.12.22	3	14.6	57.0	0.1	0.4	270.0	W	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
26.12.22	4	13.4	58.6	0.2	0.8	337.5	NWN	0.0	0.0
26.12.22	5	12.2	60.3	0.6	2.2	337.5	NWN	0.0	0.0
26.12.22	6	12.7	62.2	0.5	1.8	315.0	NW	0.0	0.0
26.12.22	7	15.1	61.7	0.5	1.8	337.5	NWN	0.0	0.0
26.12.22	8	18.1	60.0	2.2	7.9	337.5	NWN	0.0	0.0
26.12.22	9	20.2	58.3	2.2	7.9	315.0	NW	0.0	0.0
26.12.22	10	22.7	56.6	0.8	2.9	315.0	NW	0.0	0.0
26.12.22	11	22.9	53.5	1.3	4.7	315.0	NW	0.0	0.0
26.12.22	12	23.3	52.7	1.1	4.0	315.0	NW	0.0	0.0
26.12.22	13	23.7	49.6	2.2	7.8	315.0	NW	0.0	0.0
26.12.22	14	23.9	46.3	2.2	7.9	270.0	W	0.0	0.0
26.12.22	15	24.0	45.2	2.3	8.3	270.0	W	0.0	0.0
26.12.22	16	23.5	43.6	2.4	8.6	315.0	NW	0.0	0.0
26.12.22	17	23.2	44.5	4.2	15.1	270.0	W	0.0	0.0
26.12.22	18	23.0	42.7	1.1	4.0	67.5	ENE	0.0	0.0
26.12.22	19	22.0	43.9	0.9	3.1	135.0	SE	0.0	0.0
26.12.22	20	20.2	45.1	0.7	2.4	180.0	S	0.0	0.0
26.12.22	21	19.1	46.5	0.5	1.8	112.5	ESE	0.0	0.0
26.12.22	22	18.2	47.2	0.4	1.4	135.0	SE	0.0	0.0
26.12.22	23	16.7	47.8	1.1	3.9	135.0	SE	0.0	0.0
26.12.22	24	15.6	50.3	0.4	1.4	157.5	SES	0.0	0.0
27.12.22	1	15.2	52.7	0.6	2.2	135.0	SE	0.0	0.0
27.12.22	2	14.4	55.1	0.9	3.1	180.0	S	0.0	0.0
27.12.22	3	13.3	56.8	0.7	2.4	202.5	SSW	0.0	0.0
27.12.22	4	12.2	58.4	0.7	2.4	22.5	NNE	0.0	0.0
27.12.22	5	12.5	59.2	1.1	3.9	247.5	SWW	0.0	0.0
27.12.22	6	13.2	61.6	0.6	2.2	22.5	NNE	0.0	0.0
27.12.22	7	14.6	60.5	1.1	3.9	225.0	SW	0.0	0.0
27.12.22	8	16.5	59.8	1.0	3.6	225.0	SW	0.0	0.0
27.12.22	9	19.1	59.1	0.6	2.2	292.5	WNW	0.0	0.0
27.12.22	10	22.2	58.6	0.7	2.5	315.0	NW	0.0	0.0
27.12.22	11	24.3	56.4	1.2	4.3	315.0	NW	0.0	0.0
27.12.22	12	25.3	54.2	1.6	5.8	315.0	NW	0.0	0.0
27.12.22	13	25.8	51.7	2.6	9.4	270.0	W	0.0	0.0
27.12.22	14	25.9	49.3	3.7	13.3	270.0	W	0.0	0.0
27.12.22	15	26.7	46.2	2.3	8.3	67.5	ENE	0.0	0.0
27.12.22	16	26.0	45.5	2.1	7.6	315.0	NW	0.0	0.0
27.12.22	17	25.2	46.8	1.8	6.5	315.0	NW	0.0	0.0
27.12.22	18	24.2	47.9	2.2	7.9	135.0	SE	0.0	0.0
27.12.22	19	23.1	48.5	1.2	4.3	112.5	ESE	0.0	0.0
27.12.22	20	21.6	49.3	1.1	3.9	135.0	SE	0.0	0.0
27.12.22	21	20.4	50.6	0.9	3.2	135.0	SE	0.0	0.0
27.12.22	22	19.5	52.2	0.7	2.4	157.5	SES	0.0	0.0
27.12.22	23	18.2	53.8	1.3	4.7	135.0	SE	0.0	0.0
27.12.22	24	16.7	54.0	1.3	4.7	135.0	SE	0.0	0.0
28.12.22	1	15.4	56.3	0.2	0.8	135.0	SE	0.0	0.0
28.12.22	2	14.7	58.7	0.2	0.8	202.5	SSW	0.0	0.0
28.12.22	3	14.2	59.5	0.6	2.2	210.0	SSW	0.0	0.0
28.12.22	4	13.6	61.4	0.9	3.1	225.0	SW	0.0	0.0
28.12.22	5	13.1	63.7	0.5	1.8	247.5	SWW	0.0	0.0
28.12.22	6	14.2	64.6	0.8	2.9	247.5	SWW	0.0	0.0
28.12.22	7	16.3	63.2	1.7	6.3	22.5	NNE	0.0	0.0
28.12.22	8	18.2	62.5	1.1	4.0	22.5	NNE	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
28.12.22	9	20.2	59.6	1.3	4.7	22.5	NNE	0.0	0.0
28.12.22	10	22.4	56.7	1.6	5.8	247.5	SWW	0.0	0.0
28.12.22	11	23.8	54.2	2.3	8.3	225.0	SW	0.0	0.0
28.12.22	12	25.4	53.7	0.9	3.2	135.0	SE	0.0	0.0
28.12.22	13	25.5	50.8	2.6	9.4	225.0	SW	0.0	0.0
28.12.22	14	26.0	48.6	2.4	8.6	292.5	WNW	0.0	0.0
28.12.22	15	25.7	47.3	3.7	13.3	292.5	WNW	0.0	0.0
28.12.22	16	25.2	45.5	1.8	6.5	225.0	SW	0.0	0.0
28.12.22	17	25.0	44.0	2.2	7.9	270.0	W	0.0	0.0
28.12.22	18	24.3	42.9	0.7	2.5	315.0	NW	0.0	0.0
28.12.22	19	21.7	43.7	0.9	3.1	270.0	W	0.0	0.0
28.12.22	20	20.5	45.3	1.3	4.7	270.0	W	0.0	0.0
28.12.22	21	19.9	46.8	0.4	1.4	337.5	NWN	0.0	0.0
28.12.22	22	18.4	48.2	0.7	2.4	337.5	NWN	0.0	0.0
28.12.22	23	17.6	50.1	0.7	2.4	315.0	NW	0.0	0.0
28.12.22	24	16.6	51.9	0.2	0.8	315.0	NW	0.0	0.0
29.12.22	1	15.5	53.6	0.2	0.8	45.0	NE	0.0	0.0
29.12.22	2	14.4	56.2	0.9	3.1	315.0	NW	0.0	0.0
29.12.22	3	14.2	58.9	0.9	3.1	67.5	ENE	0.0	0.0
29.12.22	4	12.7	60.4	1.7	6.3	135.0	SE	0.0	0.0
29.12.22	5	13.3	61.7	0.7	2.4	135.0	SE	0.0	0.0
29.12.22	6	15.4	62.6	1.3	4.7	112.5	ESE	0.0	0.0
29.12.22	7	16.2	61.3	0.7	2.4	135.0	SE	0.0	0.0
29.12.22	8	17.4	60.8	0.7	2.5	157.5	SES	0.0	0.0
29.12.22	9	18.4	59.5	1.7	6.3	135.0	SE	0.0	0.0
29.12.22	10	20.4	58.0	1.1	3.9	315.0	NW	0.0	0.0
29.12.22	11	21.2	56.4	0.7	2.4	337.5	NWN	0.0	0.0
29.12.22	12	21.9	53.7	2.3	8.3	315.0	NW	0.0	0.0
29.12.22	13	22.2	50.4	2.2	7.9	270.0	W	0.0	0.0
29.12.22	14	22.5	48.6	3.7	13.3	315.0	NW	0.0	0.0
29.12.22	15	22.9	45.8	2.2	7.9	337.5	NWN	0.0	0.0
29.12.22	16	22.4	45.2	4.2	15.1	315.0	NW	0.0	0.0
29.12.22	17	21.2	44.5	1.3	4.7	270.0	W	0.0	0.0
29.12.22	18	20.3	43.6	1.3	4.7	270.0	W	0.0	0.0
29.12.22	19	19.7	43.8	1.8	6.5	157.5	SES	0.0	0.0
29.12.22	20	19.2	44.3	1.3	4.7	135.0	SE	0.0	0.0
29.12.22	21	18.4	44.7	0.9	3.1	315.0	NW	0.0	0.0
29.12.22	22	18.1	46.5	1.1	3.9	67.5	ENE	0.0	0.0
29.12.22	23	17.7	48.8	0.4	1.4	135.0	SE	0.0	0.0
29.12.22	24	17.3	49.2	0.4	1.4	112.5	ESE	0.0	0.0
30.12.22	1	16.6	51.9	1.1	3.9	135.0	SE	0.0	0.0
30.12.22	2	16.2	53.6	0.6	2.2	45.0	NE	0.0	0.0
30.12.22	3	15.5	56.2	0.1	0.4	45.0	NE	0.0	0.0
30.12.22	4	14.7	58.7	0.4	1.4	157.5	SES	0.0	0.0
30.12.22	5	14.2	60.0	1.7	6.3	315.0	NW	0.0	0.0
30.12.22	6	15.2	62.4	1.1	3.9	225.0	SW	0.0	0.0
30.12.22	7	16.4	61.8	1.1	3.9	315.0	NW	0.0	0.0
30.12.22	8	17.9	60.5	1.3	4.7	225.0	SW	0.0	0.0
30.12.22	9	19.4	57.8	0.7	2.5	270.0	W	0.0	0.0
30.12.22	10	20.5	55.2	1.1	4.0	67.5	ENE	0.0	0.0
30.12.22	11	22.4	52.7	0.6	2.2	135.0	SE	0.0	0.0
30.12.22	12	23.7	51.1	0.9	3.1	270.0	W	0.0	0.0
30.12.22	13	25.4	48.7	2.3	8.3	315.0	NW	0.0	0.0

2610816/2023/Estt.Br

Date	Time	Temperature (^{0}C)	Relative Humidity (%)	Wind Speed		Wind Direction (Angle)	Wind Direction (Letter)	Cloud Cover	Hourly Precipitation (mm)
				m/s	km/hr				
30.12.22	14	26.8	46.3	2.9	10.4	315.0	NW	0.0	0.0
30.12.22	15	26.3	43.9	2.3	8.3	315.0	NW	0.0	0.0
30.12.22	16	25.5	46.9	3.7	13.3	315.0	NW	0.0	0.0
30.12.22	17	24.6	43.5	1.5	5.4	315.0	NW	0.0	0.0
30.12.22	18	23.0	44.8	2.2	7.9	135.0	SE	0.0	0.0
30.12.22	19	21.8	45.0	0.5	1.8	202.5	SSW	0.0	0.0
30.12.22	20	20.4	47.2	1.1	3.9	22.5	NNE	0.0	0.0
30.12.22	21	19.1	47.9	0.6	2.2	270.0	W	0.0	0.0
30.12.22	22	17.8	49.3	0.7	2.4	247.5	SWW	0.0	0.0
30.12.22	23	16.7	51.4	1.3	4.7	225.0	SW	0.0	0.0
30.12.22	24	15.6	52.6	1.3	4.7	292.5	WNW	0.0	0.0
31.12.22	1	15.2	54.4	0.2	0.8	135.0	SE	0.0	0.0
31.12.22	2	14.6	57.3	0.3	1.1	45.0	NE	0.0	0.0
31.12.22	3	14.2	59.5	0.4	1.4	45.0	NE	0.0	0.0
31.12.22	4	13.7	60.8	0.9	3.1	157.5	SES	0.0	0.0
31.12.22	5	13.2	63.1	0.6	2.2	315.0	NW	0.0	0.0
31.12.22	6	15.2	64.8	2.2	7.9	225.0	SW	0.0	0.0
31.12.22	7	17.4	65.0	2.2	7.9	315.0	NW	0.0	0.0
31.12.22	8	19.3	64.1	0.5	1.8	225.0	SW	0.0	0.0
31.12.22	9	20.7	62.5	0.6	2.2	270.0	W	0.0	0.0
31.12.22	10	22.1	60.7	0.7	2.5	67.5	ENE	0.0	0.0
31.12.22	11	23.4	59.4	1.3	4.7	135.0	SE	0.0	0.0
31.12.22	12	24.7	56.4	1.8	6.5	270.0	W	0.0	0.0
31.12.22	13	26.3	54.1	2.3	8.3	315.0	NW	0.0	0.0
31.12.22	14	26.9	52.5	2.7	9.7	315.0	NW	0.0	0.0
31.12.22	15	26.3	49.7	2.2	7.9	315.0	NW	0.0	0.0
31.12.22	16	25.3	47.9	4.2	15.1	315.0	NW	0.0	0.0
31.12.22	17	23.8	47.2	3.7	13.3	315.0	NW	0.0	0.0
31.12.22	18	22.2	46.6	1.4	5.0	135.0	SE	0.0	0.0
31.12.22	19	20.6	45.8	2.2	7.9	202.5	SSW	0.0	0.0
31.12.22	20	19.6	46.6	0.5	1.8	22.5	NNE	0.0	0.0
31.12.22	21	18.4	47.2	0.5	1.8	270.0	W	0.0	0.0
31.12.22	22	17.6	48.8	0.7	2.4	247.5	SWW	0.0	0.0
31.12.22	23	17.2	50.2	0.5	1.8	225.0	SW	0.0	0.0
31.12.22	24	16.3	53.7	0.3	1.1	292.5	WNW	0.0	0.0

ANNEXURES – 3.2

AIR MONITORING DATA & MONITORING PHOTOGRAPHS

Annex 3.2

Daily Ambient Air Quality Results

Mahabalipur						AAQ-1
S. No.	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
1	03.10.2022	44	19	7.6	11.4	0.69
2	04.10.2022	66	22	8.6	12.9	0.58
3	10.10.2022	59	24	9.2	13.8	0.61
4	11.10.2022	71	30	7.2	10.8	0.59
5	17.10.2022	49	21	8.2	12.3	0.62
6	18.10.2022	61	24	9.3	13.2	0.65
7	24.10.2022	48	20	7.2	10.8	0.69
8	25.10.2022	59	22	<5	11.8	0.70
9	03.11.2022	41	20	6.9	10.6	0.69
10	04.11.2022	68	17	7.1	10.1	0.85
11	10.11.2022	53	24	6.8	11.6	0.69
12	11.11.2022	72	31	8.9	12.1	0.94
13	17.11.2022	43	24	6.9	10.1	0.58
14	18.11.2022	51	22	8.4	12.6	0.61
15	24.11.2022	64	26	7.9	10.1	0.94
16	25.11.2022	70	31	6.8	10.9	0.89
17	03.12.2022	52	22	8.4	11.8	0.92
18	04.12.2022	65	18	9.5	13.9	0.59
19	10.12.2022	53	24	7.8	10.5	0.64
20	11.12.2022	69	22	<5	10.6	0.99
21	17.12.2022	59	21	8.7	12.9	1.09
22	18.12.2022	45	20	9.1	13.1	0.98
23	24.12.2022	71	24	6.8	10.4	1.09
24	25.12.2022	38	17	7.8	11.2	1.01
Maximum		**72**	**31**	**9.5**	**13.9**	**1.09**
Minimum		**38**	**17**	**6.8**	**10.1**	**0.58**
Mean		**57**	**23**	**8.0**	**11.6**	**0.78**
Percentile 98		**72**	**31**	**9.4**	**13.9**	**1.09**
Standard Deviation		**11**	**4**	**0.9**	**1.2**	**0.18**

Rahimpur						AAQ-2
S. No.	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
1	05.10.2022	56	19	7.9	11.9	0.68
2	06.10.2022	63	22	8.9	13.4	0.59
3	12.10.2022	49	17	6.9	10.4	0.61
4	13.10.2022	57	20	7.8	11.7	0.91
5	19.10.2022	71	19	8.9	13.4	0.59
6	20.10.2022	66	23	9.9	13.8	0.74
7	26.10.2022	59	20	7.6	11.4	0.59
8	27.10.2022	63	22	9.8	13.1	0.88
9	05.11.2022	71	21	8.4	11.6	0.71
10	06.11.2022	69	24	8.5	12.8	0.69
11	12.11.2022	74	19	<5	11.4	0.82
12	13.11.2022	56	19	6.9	10.4	0.58
13	19.11.2022	69	24	8.1	12.2	0.85
14	20.11.2022	77	19	9.1	13.7	0.69
15	26.11.2022	69	21	7.8	11.7	0.74
16	27.11.2022	52	18	8.1	12.2	0.59
17	05.12.2022	68	24	6.9	10.4	0.82

Annex 3.2

Rahimpur						AAQ-2
S. No.	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
18	06.12.2022	61	21	<5	11.9	0.67
19	12.12.2022	53	18	8.5	12.8	0.49
20	13.12.2022	49	17	6.9	10.4	0.67
21	19.12.2022	63	22	7.1	10.7	0.78
22	20.12.2022	71	25	8.2	12.3	0.92
23	26.12.2022	68	21	6.9	10.4	0.84
24	27.12.2022	55	19	8.5	12.8	0.69
Maximum		**77**	**25**	**9.9**	**13.8**	**0.92**
Minimum		**49**	**17**	**6.9**	**10.4**	**0.49**
Mean		**63**	**21**	**8.1**	**11.9**	**0.71**
Percentile 98		**76**	**25**	**9.9**	**13.7**	**0.92**
Standard Deviation		**8**	**2**	**0.9**	**1.1**	**0.12**

Bhawana						AAQ-3
S. No.	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
1	01.10.2022	57	22	9.5	13.3	0.86
2	02.10.2022	53	19	7.3	10.2	0.46
3	08.10.2022	49	17	8.4	11.8	0.68
4	09.10.2022	51	18	9.5	13.3	0.59
5	15.10.2022	48	17	10.6	14.8	0.61
6	16.10.2022	41	15	<5	11.8	0.58
7	22.10.2022	59	21	8.4	12.1	0.67
8	23.10.2022	61	22	6.2	10.1	0.49
9	01.11.2022	58	21	7.6	11.5	0.68
10	02.11.2022	68	24	6.9	10.1	0.98
11	08.11.2022	46	16	7.8	10.9	0.82
12	09.11.2022	75	28	9.1	12.7	0.67
13	15.11.2022	59	21	6.9	10.1	0.92
14	16.11.2022	71	27	8.4	11.8	0.84
15	22.11.2022	48	17	7.6	10.6	0.69
16	23.11.2022	47	18	<5	12.5	0.81
17	01.12.2022	54	21	8.4	11.8	0.98
18	02.12.2022	46	16	6.9	10.1	1.05
19	08.12.2022	52	18	7.8	10.9	1.12
20	09.12.2022	71	27	9.6	13.4	1.06
21	15.12.2022	53	19	7.1	10.2	0.81
22	16.12.2022	64	23	8.3	11.6	0.99
23	22.12.2022	59	21	7.8	10.9	1.02
24	23.12.2022	46	16	6.9	10.1	0.98
Maximum		**75**	**28**	**10.6**	**14.8**	**1.12**
Minimum		**41**	**15**	**6.2**	**10.1**	**0.46**
Mean		**56**	**20**	**8.0**	**11.5**	**0.81**
Percentile 98		**73**	**28**	**10.2**	**14.2**	**1.09**
Standard Deviation		**9**	**4**	**1.1**	**1.3**	**0.19**

Atwa						AAQ-4
S. No.	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
1	03.10.2022	59	20	7.6	11.4	0.56
2	04.10.2022	54	19	8.5	12.8	0.62

Annex 3.2

Atwa						AAQ-4
S. No.	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
3	10.10.2022	76	26	6.4	10.1	0.81
4	11.10.2022	80	28	8.9	13.4	0.69
5	17.10.2022	78	27	9.1	13.7	0.74
6	18.10.2022	64	22	8.5	12.8	0.52
7	24.10.2022	76	26	7.4	11.1	0.74
8	25.10.2022	59	20	<5	10.4	0.89
9	03.11.2022	71	24	9.5	14.3	0.98
10	04.11.2022	68	24	8.4	12.6	0.68
11	10.11.2022	56	19	7.6	11.4	0.59
12	11.11.2022	58	20	6.9	10.4	0.81
13	17.11.2022	62	21	7.8	11.7	0.92
14	18.11.2022	78	27	8.9	13.4	0.68
15	24.11.2022	80	28	<5	13.7	0.59
16	25.11.2022	52	18	7.8	11.7	0.81
17	03.12.2022	74	26	8.6	12.9	0.78
18	04.12.2022	52	18	9.4	14.1	0.92
19	10.12.2022	48	17	7.8	11.7	0.68
20	12.12.2022	41	21	6.8	10.2	0.59
21	17.12.2022	65	22	7.1	10.7	0.49
22	18.12.2022	58	20	8.7	13.1	0.78
23	24.12.2022	74	26	9.9	14.9	0.91
24	25.12.2022	59	20	10.1	13.5	0.82
Maximum		**80**	**28**	**10.1**	**14.9**	**0.98**
Minimum		**41**	**17**	**6.4**	**10.1**	**0.49**
Mean		**64**	**22**	**8.3**	**12.3**	**0.73**
Percentile 98		**80**	**28**	**10.0**	**14.6**	**0.95**
Standard Deviation		**11**	**4**	**1.0**	**1.4**	**0.14**

Gharbhara						AAQ-5
S. No.	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
1	01.10.2022	57	21	8.6	12.0	0.69
2	02.10.2022	46	17	7.6	10.6	0.64
3	08.10.2022	54	20	10.1	13.9	0.58
4	09.10.2022	70	25	8.6	12.0	0.69
5	15.10.2022	54	22	7.9	11.1	0.49
6	16.10.2022	64	23	8.9	12.5	0.52
7	22.10.2022	73	25	7.2	10.1	0.59
8	23.10.2022	56	20	8.1	11.3	0.74
9	01.11.2022	51	19	6.9	10.1	0.69
10	02.11.2022	47	17	7.4	10.4	0.82
11	08.11.2022	44	16	6.9	10.5	0.99
12	09.11.2022	73	21	8.2	11.5	1.05
13	15.11.2022	67	24	<5	12.5	0.95
14	16.11.2022	44	16	6.4	10.1	0.85
15	22.11.2022	48	18	8.5	11.9	0.74
16	23.11.2022	58	21	6.9	10.1	0.65
17	01.12.2022	54	20	7.4	10.4	0.78
18	02.12.2022	70	25	8.6	12.0	0.69
19	08.12.2022	49	18	7.4	10.4	0.84
20	09.12.2022	64	23	6.9	10.1	0.69

Annex 3.2

Gharbhara						AAQ-5
S. No.	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
21	15.12.2022	54	25	7.1	11.4	0.82
22	16.12.2022	62	22	<5	13.5	0.76
23	22.12.2022	54	20	8.4	11.8	0.81
24	23.12.2022	58	21	7.6	10.6	0.99
Maximum		**73**	**25**	**10.1**	**13.9**	**1.05**
Minimum		**44**	**16**	**6.4**	**10.1**	**0.49**
Mean		**57**	**21**	**7.8**	**11.3**	**0.75**
Percentile 98		**73**	**25**	**9.6**	**13.7**	**1.02**
Standard Deviation		**9**	**3**	**0.9**	**1.1**	**0.15**

Jhuppa						AAQ-6
S. No.	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
1	03.10.2022	49	17	8.6	12.9	0.64
2	04.10.2022	52	18	8.1	14.1	0.79
3	10.10.2022	63	22	7.8	12.3	0.66
4	11.10.2022	74	24	8.9	14.9	0.79
5	17.10.2022	51	17	<5	12.5	0.56
6	18.10.2022	67	23	9.1	13.7	0.51
7	24.10.2022	59	20	8.4	12.6	0.69
8	25.10.2022	61	21	7.1	10.7	0.74
9	03.11.2022	63	22	9.1	13.8	0.98
10	04.11.2022	78	24	7.8	11.7	1.05
11	10.11.2022	68	23	8.4	12.6	0.98
12	11.11.2022	63	22	6.9	10.4	0.85
13	17.11.2022	58	20	7.8	11.7	0.64
14	18.11.2022	74	25	8.1	14.1	0.76
15	24.11.2022	69	24	8.9	13.4	0.82
16	25.11.2022	58	20	10.1	15.2	0.99
17	03.12.2022	68	23	9.1	13.7	1.04
18	04.12.2022	54	19	8.6	12.9	1.02
19	10.12.2022	48	17	,5	11.1	1.09
20	11.12.2022	59	20	6.9	10.4	0.98
21	17.12.2022	75	26	8.4	12.6	0.65
22	18.12.2022	71	25	7.9	11.9	0.99
23	24.12.2022	68	23	8.6	12.9	1.01
24	25.12.2022	55	19	7.8	11.7	0.87
Maximum		**78**	**26**	**10.1**	**15.2**	**1.09**
Minimum		**48**	**17**	**6.9**	**10.4**	**0.51**
Mean		**63**	**21**	**8.3**	**12.6**	**0.84**
Percentile 98		**77**	**26**	**9.7**	**15.0**	**1.07**
Standard Deviation		**9**	**3**	**0.8**	**1.3**	**0.17**

Fatehpur						AAQ-7
S. No.	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
1	05.10.2022	52	18	7.6	11.4	0.74
2	06.10.2022	58	20	9.4	14.1	0.58
3	12.10.2022	69	22	8.4	12.6	0.69
4	13.10.2022	51	17	7.6	11.4	0.85
5	19.10.2022	62	21	<5	13.2	0.92

Annex 3.2

Fatehpur						AAQ-7
S. No.	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
6	20.10.2022	56	19	8.3	12.5	1.06
7	26.10.2022	45	16	7.6	11.4	0.99
8	27.10.2022	64	22	6.9	10.4	1.02
9	05.11.2022	62	21	8.4	12.6	0.94
10	06.11.2022	52	18	7.8	11.7	0.85
11	12.11.2022	60	21	8.4	12.6	0.69
12	13.11.2022	51	18	8.1	12.2	0.85
13	19.11.2022	65	22	8.9	13.4	0.74
14	20.11.2022	49	17	<5	11.1	0.69
15	26.11.2022	62	21	8.9	13.4	0.58
16	27.11.2022	52	18	9.9	11.8	0.92
17	05.12.2022	49	17	7.8	10.1	0.79
18	06.12.2022	54	19	8.6	12.9	0.99
19	12.12.2022	63	22	6.9	10.4	1.02
20	13.12.2022	69	21	7.9	11.9	0.84
21	19.12.2022	49	17	8.1	12.2	0.97
22	20.12.2022	58	20	9.3	14.0	0.85
23	26.12.2022	63	22	7.8	11.7	0.69
24	27.12.2022	59	20	8.9	13.4	0.58
Maximum		**69**	**22**	**9.9**	**14.1**	**1.06**
Minimum		**45**	**16**	**6.9**	**10.1**	**0.58**
Mean		**57**	**20**	**8.3**	**12.2**	**0.83**
Percentile 98		**69**	**22**	**9.7**	**14.0**	**1.04**
Standard Deviation		**7**	**2**	**0.8**	**1.1**	**0.15**

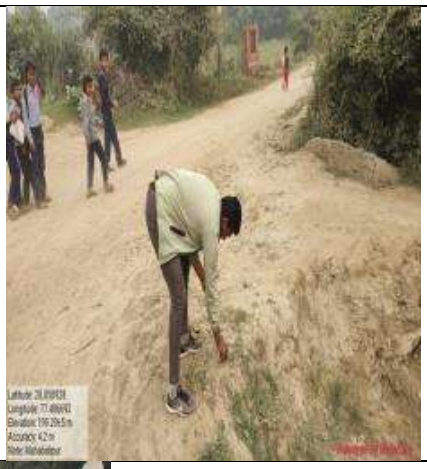
Kashipur						AAQ-8
S. No.	Date	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
1	03.10.2022	58	20.0	7.9	11.9	0.64
2	04.10.2022	63	22.0	8.6	12.9	0.79
3	10.10.2022	54	19.0	7.5	11.3	0.66
4	11.10.2022	62	21.0	6.9	10.4	0.79
5	17.10.2022	46	16.0	8.4	12.6	0.56
6	18.10.2022	60	21.0	6.8	10.2	0.51
7	24.10.2022	48	17.0	7.8	11.7	0.69
8	25.10.2022	63	22.0	9.1	13.7	0.74
9	03.11.2022	72	24.0	8.5	12.8	0.98
10	04.11.2022	51	18.0	6.9	10.4	1.05
11	10.11.2022	68	23.0	<5	13.1	0.98
12	11.11.2022	61	21.0	9.1	13.7	0.85
13	17.11.2022	58	20.0	7.8	11.7	0.64
14	18.11.2022	48	17.0	9.4	14.1	0.76
15	24.11.2022	69	24.0	8.4	12.6	0.82
16	25.11.2022	58	20.0	7.6	11.4	0.99
17	03.12.2022	68	23.0	8.9	13.4	1.04
18	04.12.2022	54	19.0	6.7	10.1	1.02
19	10.12.2022	71	24.0	<5	12.4	1.09
20	12.12.2022	59	20.0	8.7	13.1	0.98
21	17.12.2022	48	17.0	9.1	13.7	0.65
22	18.12.2022	59	20.0	8.1	12.2	0.99
23	24.12.2022	52	18.0	7.6	11.4	1.01

Annex 3.2

Kashipur						AAQ-8
S. No.	**Date**	**PM_{10} ($\mu g/m^3$)**	**$PM_{2.5}$ ($\mu g/m^3$)**	**SO_2 ($\mu g/m^3$)**	**NO_x ($\mu g/m^3$)**	**CO (mg/m^3)**
24	25.12.2022	48	17.0	8.2	12.3	0.87
Maximum		**72**	**24**	**9.4**	**14.1**	**1.09**
Minimum		**46**	**16**	**6.7**	**10.1**	**0.51**
Mean		**58**	**20**	**8.1**	**12.2**	**0.84**
Percentile 98		**72**	**24**	**9.3**	**13.9**	**1.07**
Standard Deviation		**8**	**2**	**0.8**	**1.2**	**0.17**

2610816/2023/Estt.Br

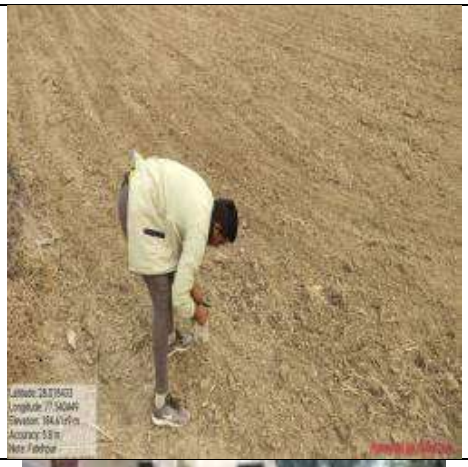
PHOTOGRAPH of M/S M. M. Traders

S. No.	LOCATION	PHOTOGRAPHS
1.	**Mahabali Pur** Ambient Air Noise Soil	  
2.	**Rahimpur** AMBIENT AIR NOISE SOIL SAMPLE GROUND WATER	 

2610816/2023/Estt.Br

			
3.	**Bhawana** AMBIENT AIR NOISE		
4.	**Bilochpur** Ambient Air Noise Water sample Soil		
			

5.	**Gharbhara** Ambient Air Noise Water sample Soil Sample		
			
6.	**Jhuppa** Ambient Air Noise		
7.	**Fatehpur** Ambient Air Noise Soil Sample		

			
8.	**Kashipur** Ambient Air Noise Water sample Soil Sample		
			
9.	SURFACE WATER		
		YAMUNA RIVER (SURAFCE WATER)	Yamuna River Near Sultanpur (SW)

		
		Yamuna River Near Bilochpur (Surface Water)
10.	**SULTAN WATER SAMPLE**	

ANNEXURES – 3.3

CONSERVATION PLAN FOR BIODIVERSITY

2610816/2023/Estt.Br

M/S M.M. TRADERS

WILDLIFE CONSERVATION PLAN FOR SCHEDULE-I SPECIES

SUBMITTED BY

M/s M.M. Traders
River Sand Mining (Minor Mineral),
At-Village-Sultanpur & Atwa,
Tehsil & District-Palwal
Haryana

2022

Table of Contents

CHAPTER-1: PROJECT DETAILS

1.1 INTRODUCTION

Biodiversity management is considered as a difficult task as it refers to diversity at all levels like genetic, species and community. The formulation of a biodiversity management and wildlife conservation plan for a developmental Project is one of the steps towards the environment conservation. Human activities like agricultural expansion, road construction, urbanization, and other mining/industrial activities are supposed to be major threats to biodiversity and wildlife, therefore, the most effective and efficient mechanisms for conserving biodiversity is to prevent further destruction of degradation of habitats. Four strategies required for the biodiversity management are in Situ strategy, ex Situ Strategy, reduction of anthropogenic pressure and rehabilitation of endangered species.

1.2 PROJECT DESCRIPTION & LOCATION

This is the sand mine project on riverbed of Yamuna River. Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River with 10,80,000 MT/ year production over an area of 33.42 ha located at Village Sultanpur, Tehsil & District Palwal and State Haryana.

Based on Haryana Government Gazette notification dated 25-05-2022 issued by DMG, Haryana and the Khasra map submitted by the applicant, survey of the area was carried out along the course of the river Yamuna in the revenue villages of Sultanpur and Atwa as detailed above which flow from North to South side. Workings will be restricted within the lease area/ khasra allotted. Mining activities will be carried out in a manner so that there is no obstruction to the movement of water flow, if any, during rainy season. The total length of the lease area is about 1.50km. The period of lease shall be 08 years & the same shall commence with effect from the date of grant of Environment Clearance by Competent Authority.

Table 1.2: Approvals / Permissions from Concerned Authorities

NOCs	Approval / Permission Details
Lease Grant	Letter of Intent has been issued by the Director Mines & Geology Haryana vide letter no. **DMG/HY/SULTANPUR UNIT/PALWAL/2022/5242 PANCHKULA dated 17-08-2022** for Mining of Sand (Minor Mineral) in Sultanpur Unit, comprising Sultanpur &Atwa villages over an area of 33.42 hectares in district Palwal, Haryana for a period of 8 years.
Cluster NOC	The information was asked about other mines coming within 500m radius from the lease from Department of Mines and Geology, Faridabad. The clarification from department vide letter **MO/FBD/6926 dated 29.08.2022** confirms there is no other mining activity within 500m from project lease boundary to form mining cluster. So, it is individual project in the area.
Mining Plan	As per rule 70 of Haryana Minor Mineral Concession, Stocking, Transportation of Minerals & Presentation of Illegal Mining Rule, 2012, the mining plan was submitted to department and mining plan was approved vide reference no. **DMG/HG/SULTANPUR UNIT/2022/6375-6378 DATED 18.10.2022**.
Forest NOC	Clarification for No forest involved in proposed lease for both pits have been obtained vide **Reference No. (SRN): QC6-9N2-V919 dated 28.09.2022** for Sultanpur unit &**Reference No. (SRN): XU8-D8R-RJVJ dated 28.09.2022** for Atwa unit.

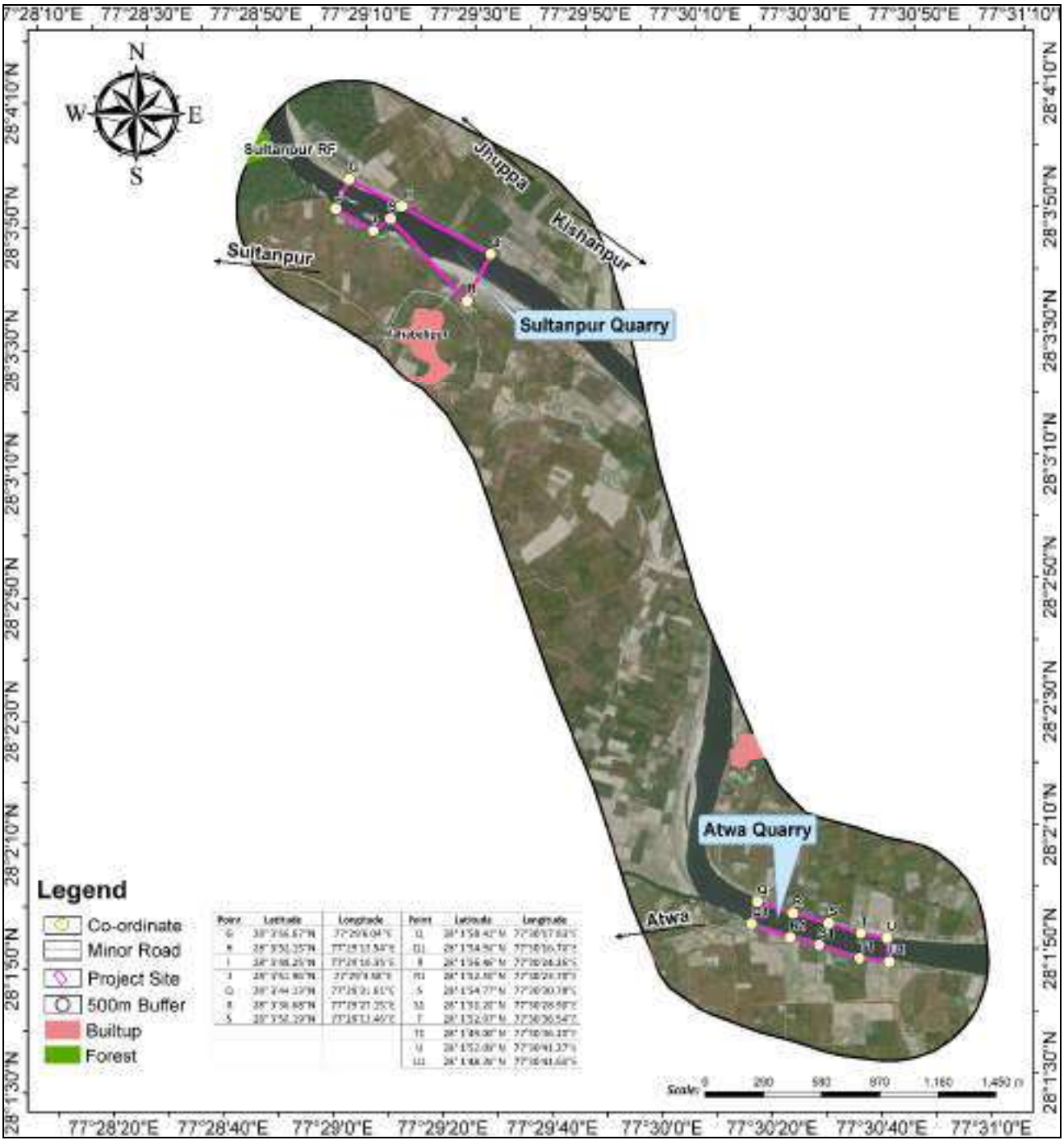


Figure 1: Location Map of proposed River Sand Mining Project

There is no forest land involved in the M.L. area. The entire mining contract lies in River bed of Yamuna River. There is Following RF/ PF present in the study area.

1.3 NEED OF THE PROJECT

Building huge infrastructure as envisaged by Government of India/Haryana Government particularly in road and housing sector requires basic building and construction raw materials. Sand is the primary building material required for the purpose. The mining activities as proposed are the backbone of all construction and infrastructure projects as the raw material for construction is made available only from such mining. The sand to be excavated is in high demand at the local market for real estate and infrastructure industry.

This project will also provide employment to local people helping them earn livelihood. In addition to this, it will further prevent widening of the Yamuna river bed due to the deposition of sediments which if not mined out will result in raising of the river bed causing flooding, damage to the adjoining areas, destruction of life and property..

1.4 PROJECT PROPONENT

S. No.	Parameters	Description
1.	Name of the project	Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit)
2.	Nature & category of Mine	Non-Coal Mining Category 'B' of Activity 1(B)
3.	Project Proponent	M/s M. M. Traders
4.	Khasra No.	**For Mining (Sultanpur Unit)** 122/9// 9 min, 122/3// 3 min, 4, 5, 6, 7, 8 min, 14 min, 15, 16 min, 122/4// 10, 11, 12, 13, 16, 17, 18, 19, 20 min, 21, 22 min, 23 min, 24, 25, 122/ 5// 2, 3 min, 4, 5, 6, 7 min, 8, 14 min, 15 min, 122 min. For Ancillary area (Sultanpur Unit) 122/3// 11, 12, 19, 20, 21, 22, 122/6// 1, 2, 122//2 15, 16/1, 16/2, 25. **For Mining (Atwa Unit)**

S. No.	Parameters	Description		
		9// 10 min, 11 min, 12 min, 13 min, 16 min, 17 min, 18, 19, 20, 21 min, 22 min, 23, 24, 25 8// 21 min, 22 min, 24 min, 25 min 15//, 2 min, 3 min, 4 min, 5, 6 min, 16//, 1, 2 min, 9 min, 10 10//, 4 min, 6 min, 7 min, 14 min, 15, 16 min, 17 min, 25/2 min. For Ancillary area (Atwa Unit) 14// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.		
5.	Total Lease area	33.42 Ha (Riverbed of Yamuna River)		
6.	Location of the project	Village- Sultanpur &Atwa, Taluk- Sultanpur, District- Palwal, Haryana		
7.	Toposheet No.	H43X8 - Project Site & H43X8, H43X12, G43F5 & G43F9 - Study Area.		
8.	Maximum Production Capacity	10,80,000 Metric Tonne / Year		
9.	Geological Mineral Reserve	13,53,456 Metric Tonne		
10.	Mineable Reserve	10,81,296 Metric Tonne		
11.	Geographical co-ordinates	**Point**	**Longitude**	**Latitude**
		SULTANPUR UNIT		
		G	28°03'56.67"N	77°29'6.04"E
		H	28°03'52.15"N	77°29'15.54"E
		I	28°03'48.25"N	77°29'10.35"E
		J	28°03'51.96"N	77°29'3.58"E
		Q	28°03'44.13"N	77°29'31.61"E
		R	28°03'36.68"N	77°29'27.15"E
		S	28°03'50.19"N	77°29'13.46"E
		ATWA UNIT		
		Q	28°01'58.42"N	77°30'17.83"E

S. No.	Parameters	Description		
		Q1	28°01'54.90"N	77°30'16.70"E
		R	28°01'56.46"N	77°30'24.26"E
		R1	28°01'52.50"N	77°30'23.70"E
		S	28°01'54.77"N	77°30'30.78"E
		S1	28°01'51.20"N	77°30'28.90"E
		T	28°01'52.97"N	77°30'36.54"E
		T1	28°01'49.00"N	77°30'36.20"E
		U	28°01'52.09"N	77°30'41.27"E
		U1	28°01'48.30"N	77°30'41.60"E
12.	Topography of ML area	Highest elevation in riverbed at extreme north end is 181.30mRL and bank top level is 184.0 mRL whereas the levels at the extreme south end in riverbed is 176.00mRL and Riverbank top is 179.00 mRL. The Yamuna River flows from NW to SE direction in Sultanpur revenue village whereas its direction of flow in Atwa area riverbed is almost west to east.		
13.	Mining Method & Technology	Opencast manual method will be adopted. No specific method of exploration is required as the river borne sediments are deposited all along the riverbed and are very well exposed on the surface. Moreover, these sediments are accumulated/ replenished every year during rainy season by flood waters to almost the same level depending on the intensity of rains on the upstream side. Adequate quantity of sand reserves is available for meeting consumer demand.		
14.	Ultimate depth of Mining	3 m from the riverbed of Yamuna River		
15.	Ground water level	05 - 10 m from the surface level		
16.	GWT intersection	Mining will be done only up to 3m from surface. So, ground water table will not be intersected.		

<table>
<tr><th>S. No.</th><th>Parameters</th><th colspan="3">Description</th></tr>
<tr><td>17.</td><td>Drainage pattern/ water courses</td><td colspan="3">Mining will be done in dry riverbed; stream will not be touched and will be done only during non-monsoon period.</td></tr>
<tr><td rowspan="5">18.</td><td rowspan="5">Water requirement & source</td><td colspan="3">The source of water is private water tankers. The break-up of water requirement is as follows:</td></tr>
<tr><td>S. No.</td><td>Description</td><td>Demand</td></tr>
<tr><td>1</td><td>Dust Suppression</td><td>29.3 KLD</td></tr>
<tr><td>2</td><td>Greenbelt Development</td><td>7.9 KLD</td></tr>
<tr><td>3</td><td>Domestic Requirement</td><td>3.0 KLD</td></tr>
<tr><td></td><td colspan="2">Total</td><td>40.2 KLD</td></tr>
<tr><td>19.</td><td>Cost of project</td><td colspan="3">The capital cost for the project will be Rs. 50 lakh including proposed lease area and machinery will be hired on contract bases.</td></tr>
</table>

1.5 MANPOWER REQUIREMNET

Around 67 workers will be employed directly and 100-150 indirectly in the proposed project. Transportation is required. Hence jobs and business opportunities in logistical activities will come up.

Table 1.5: Manpower Requirement

S. No.	Category	Numbers
1	Manager – 1stClass	1
2	Assistant managers	2
3	Foreman/Mates	2
4	Supervisory staff	2
5	Skilled personnel	40
6	Semi-skilled personnel	10
7	Un-skilled personnel	10
	Total	67

1.6 WATER REQUIREMENT

The total water requirement will be 40.2 KLD which will be sourced from the nearby villages through tankers.

S. No.	Purpose	Water Demand
1	Dust Suppression	29.3 (KLD)
2	Greenbelt Development	7.9 (KLD)
3	Domestic Requirement	3.0 (KLD)
	Total	**40.2 KLD**

1.7 EFFLUENT GENERATION

No liquid effluent will be generated at the mine site. Only domestic waste water will be generated from mine office etc. which will be disposed off in septic tank.

1.8 SOLID WASTE MANAGEMENT

There will be no OB or waste generation as the sand is exposed in the river bed.

CHAPTER-2: BIOLOGICAL ENVIRONMENT

2.1. INTRODUCTION

Conservation of Biodiversity is essential for the survival of the biosphere. Biodiversity consists of two components: richness, or taxonomic diversity, and evenness, or the distribution of individuals among taxa. Anthropogenic factors are eroding both the richness as well as evenness components of the biodiversity, jeopardizing the survival of human race itself. This realization has initiated serious efforts towards conservation of both the components of biodiversity. One of the causes for the erosion of biodiversity has been recognized to be the mining/industrial/developmental activity. The present study was carried out to centralize at near Village – Sultanpur & Atwa, Tehsil & District-Palwal (Haryana).

Living forms cover a very wide spectrum of species and even a small area may have thousands of species including bacteria, protozoa, worms, insects, plants, animals and birds. In the present study, Flora (trees, small trees, shrubs, under shrubs, climbers and grasses) and Fauna (mammals, birds and reptiles) are considered. It is needless to emphasize that living system is extremely complicated. They are directly affected by changes in the physical environment but may often either adapt or avoid the adverse environmental conditions.

Generally, biological communities are the best indicators of climatic and edaphic factors. Studies on biological aspects of ecosystems are important in Environmental Impact Assessment for safety of natural flora and fauna. Information on the impact of environmental stress on the community structure serves as an inexpensive and efficient early warning system to check the damage to a particular ecosystem. The biological environment includes mainly terrestrial and aquatic ecosystems.

A change in the composition of biotic communities is reflected by a change in the distribution pattern of natural species of flora and fauna existing in the ecosystem. The sensitivity of animal and plant species to the changes occurring in their existing ecosystem can, therefore, be used for monitoring Environmental Impact Assessment studies of any project.

2.2. OBJECTIVES OF THE STUDY

- To collect the baseline data for the study along with a description of the existing terrestrial, wetland and aquatic biodiversity.
- To assess the scheduled species in the proposed site (rare, endangered, critically endangered, endemic and vulnerable).
- To identify the locations and features of ecological significance by reconnaissance survey.
- To identify the impacts of a proposed project during the mining activities.
- To identify the livelihood dependency on NTFPs.
- To assess the wildlife presence within the 10 km study area.

Table 1: Mode of Data Collection and Parameters considered during the survey

Sr. No.	Aspect	Mode of Data collection	Parameters monitored	Remarks
1.	Terrestrial Biodiversity	By field survey	Floral and Faunal diversity	**For Floral Diversity:** Random survey, sapling survey/forest inventory, walking transect, collection and identification with the help of relevant literature. **For Faunal Diversity:** direct and indirect sampling, walking transect, point sampling and nest sampling etc.
2.		From authentic sources like Forests department of Haryana and available published literatures from ZSI, BSI etc.	Floral and Faunal diversity and study of vegetation, forest type, importance etc.	Data collected from the working plan of the region, forest types from the authentic literature of Champion & Seth.
3.	Aquatic Biodiversity	By field survey	Floral and Faunal diversity	**For Plankton Study-** Lackey's drops method and light microscope **For other aquatic-** Random survey, opportunistic observations
4.		From authentic sources like Forests department of Haryana.	Floral and Faunal diversity and study of vegetation, forest	Desktop literature review to indentify the representative spectrum of threatened species,

			type, importance etc.	population and ecological communities.

2.3. RIPARIAN ENVIRONMENT

Riparian habitats are the interface of terrestrial and aquatic ecosystems and they are essential in controlling flows of energy and nutrients between terrestrial and aquatic ecosystems. Despite the relatively small area that they occupy within the landscape, riparian zones provide a major contribution to the ecology and biodiversity in the areas where they occur.

The study of riparian vegetation of a river is an important as it strongly affects soil-water characteristics of the area and thus the aquatic life. Moreover, the vegetation provides the human population with vital life support and socio- economic security. Riparian zones often regulate aquatic-terrestrial linkages. Riparian vegetation is important for regulating nutrient cycle of the streams, preventing soil erosion and stabilizing river banks. Further, the riparian vegetation is modified or destroyed by grazing, logging, urbanization, road construction, water development, mining and recreation. Also, the riparian zone is thought to have a disproportionate influence (relative to its land area) on the running water because of its immediate effects on the transport of water, nutrients and sediments. The district is mainly drained by the river Yamuna River and its tributaries.

Table 2: Location sites for the study of Riparian Vegetation

Sr. No.	Site Location	Direction
I.	Yamuna River (Up Stream) near Bhikuka	North
II.	Yamuna River (Down Stream) near Chainsa	South

2.4. TERRESTRIAL FLORA & FAUNA

Biological communities are the indicator environmental condition and resource of its distribution and survival. Biotic component comprises of both plants (Flora) and animal (Fauna) communities, which interact not only within and between them but also with the Abiotic components, viz. physical and chemical components of the environment. The changes in biotic community are studied in the pattern of distribution, abundance and diversity.

2.5.1. TERRESTRIAL FLORA

The Vegetation and plant species composition observed and documented during field visit in and around the proposed location of the project. Besides primary surveys in the project sites, published literature and various floras were consulted to prepare an inventory of plant species growing at project sites. The vegetation of the study area is highly degraded and some areas consisting water bodies. The plant diversity is classified into various plant groups such as tree, shrubs, herbs, climbers, sedges and grasses. The plant diversity survey in the project area was undertaken during the summer season with the objectives of preparing a checklist of flora in the study area which is divided into two parts i.e. Core Zone & Buffer Zone.

Core Zone: The Sultanpur unit River sand mine is located in Village - Sultanpur & Atwa, Tehsil & District- Palwal, Haryana is covered under the Survey of India toposheet no. H43X8. Total M.L. area is **33.42 ha,** which is a non-forest land.

Buffer Zone: The selection of terrestrial and aquatic ecological sampling location was based on land use pattern, topography and habitat patterns of the study area. The terrestrial ecological survey was carried out in forest and non-forest areas (agricultural fields, roadsides, urban & semi-urban wastelands etc) and the aquatic ecological survey was carried out at rivers & ponds/lakes within the study area.

2.5.2. METHODOLOGY

The Floral study survey was made to assess the existing plant species in all accessible areas within the 10 km radius by the crisscross method of field exploration. The local flora was identified by their morphological observation, such as its size and shape of the leaf, flowers, fruits and their bark features of stem and also documented their habitat viz. Trees, Shrubs, Herbs, Grasses and Climbers etc. The plants which were not identified in the field were collected, brought to the laboratory and identified using standard herbarium references. Photo documentation of some of the key species presents the study area was also done.

A preliminary survey of the study area has been performed to get a general picture of the landscapes in vegetation. Traverses have been taken within different zone of the study area to note major vegetation patterns and plant communities including their growth form and dominant species. A **forest inventory** is **“an attempt to describe the quantity and**

quality of forest trees and many of the characteristics of the land area upon which the trees are grown." The objective this floral inventory of the study area, is to provide complete checklist of floristic structure within the core zone and buffer zone (10 km radial distance) from project site for formulating effective management and conservation measures.

Biological environment is a good bio-indicator of changing environmental quality. Reconnaissance survey was undertaken around the proposed project site. In the present survey 10 km radius area around the project site was considered as study area. Both terrestrial and aquatic ecological analysis was carried out in the field and in the laboratory. Assessment of flora and fauna was undertaken in the study area. The field study was undertaken during December-2022.

In addition to the field study, literature review /desk research was carried out to determine the existing conditions within the study area and to identify habitats and species of potential importance that may be affected by the Project.

The following parameters were primarily considered in the study.

- Assessment of present state of vegetation, flora and fauna in the study area.
- Collection of data from literature about the flora and fauna accounts
- Identification of rare, endangered plants and animal species (if any).
- Identification of important plants/animals species having diverse economic values.

The study area falls under the category of **Tropical Desert Thorn** and comprise predominantly of xerophytes. The area is sparsely populated and is almost plain. The study area contains plantations around villages. There is no wildlife and bird sanctuary within the study area. The biotic environment can be described under following heads:

1 Core Zone/Project Site

2 Buffer Zone: (Area within 10 km radius): The Buffer Zone can further be described as per the types of the land use.

   i. Terrestrial Ecology

   ii. Aquatic Ecology

2.5.3. FLORISTIC COMPOSITION OF CORE & BUFFER ZONE

Though natural vegetation of this area is very poor except some degraded patches of evergreen scrub or thorny forests, but overall floral diversity is fairly high. The major components of natural forest are Dhak of Palas (*Butea monosperma*), Jand (*Prosopis cineraria*), Kaur (*Capparis decidua*), Kikar (*Acacia nilotica*) and Datepalm (*Phoenix sylvestris).*

During present field survey, a large number of plant species were recorded in different habitats. They are listed in **Table-3**. There is no rare and endangered plant species in the present study area.

Table 3: List of floral diversity from the study area

Sr. No.	SCIENTIFIC NAME	LOCAL NAME	FAMILY
(A) Trees:			
1	*Acacia nilotica*	Kikar	Fabaceaae
2	*Acacia Senegal*	Khair	Fabaceaae
3	*Albizia lebbeck*	Kala siris	Fabaceaae
4	*Albizia procera*	Safed siris	Fabaceaae
5	*Alslonia scholoris*	Chatim	Apocyanaceae
6	*Ailanthes excelsa*	Arusa	Simaroubaceae
7	*Azadiracta indica*	Neem	Meliaceae
8	*Bauhinia purpurea*	Kachnar	Caesalpiniaceae
9	*Bombax ceiba*	Semal	Malvaceae
10	*Butea monosperma*	Dhak	Fabaceae
11	*Cassia fistula*	Amaltas	Fabaceae
12	*Cassia siamea*	Kassod	Caesalpiniaceae
13	*Casuarina equisetifolia*	Jungli Saru	Casuarinaceae
14	*Callistemon speciosus*	Bottle Brush	Myrtaceae
15	*Crataeva nurvala*	Baruna	Capparaceae
16	*Dalbergia sissoo*	Shisham	Fabaceae
17	*Delonix regia*	Gulmohar	Fabaceae
18	*Diospyros cordifolia*	Bistendu	Ebenaceae
19	*Erythrina arborescens*	Roringe	Fabaceae
20	*Eucalyptus globosus*	Nilgiri/Safeda	Mytraceae
21	*Ficus benghalensis*	Bargad	Moraceae
22	*Ficus religiosa*	Pipal	Moraceae
23	*Ficus palmata*	Anjir	Moraceae
24	*Ficus glomerata*	Gullor	Moraceae
25	*Holoptelea integrifolia*	Papri	Ulmaceae
26	*Pithecellobium dulce*	Jungle Jalebi	Fabaceae
27	*Leucaena leucocephala*	Safed babul	Mimosaceae
28	*Magnolia champaka*	Champa	Magnoliaceae

Sr. No.	SCIENTIFIC NAME	LOCAL NAME	FAMILY
29	*Mangifera indica*	Aam	Anacardiaceae
30	*Mimusops elengi*	Maulsari	Sapotaceae
31	*Melia azedarach*	Bakain	Meliaceae
32	*Moringa oleifera*	Sohanjana	Moringaceae
33	*Morus alba*	Toot	Moraceae
34	*Millingtonia hortensis*	Akas neem	Bignoniaceae
35	*Mitragyna parvifolia*	Phaldu	Rubiaceae
36	*Parkinsonia aculeata*	Ram Babul	Fabaceae
37	*Phoenix sylvestris*	Khazoor	Arecaceae
38	*Pongamia pinnata*	Karanj	Fabaceae
39	*Prosopis juliflora*	Khejri	Fabaceae
40	*Prosopis cineraria*	Jand	Fabaceae
41	*Populus deltoides*	Poplar	Salicaceae
42	*Polyalthia longifolia*	Debdaru	Anonnaceae
43	*Putranjiva roxburghii*	Jivanputra	Putranjivaceae
44	*Salix tetrastomatica*	Willow	Salicaceae
45	*Syzygium cumini*	Jamun	Myrtaceae
46	*Tamarindus indica*	Imli	Caesalpiniaceae
47	*Tectona grandis*	Sagun	Verbenaceae
48	*Terminalia arjuna*	Arjun	Combretaceae
49	*Terminalia belerica*	Bahera	Combretaceae
50	*Thevetia peruviana*	Karabi	Apocyanaceae
51	*Ziziphus mauritiana*	Ber	Rhamnaceae
(B) Shrubs and Herbs			
1	*Abutilon indicum*	Kanghi	Malvaceae
2	*Achyranthes aspera*	Chirchita	Amoranthaceae
3	*Adhatoda vasica*	Bansak	Acanthaceae
4	*Aerva tomentosa*	Bui	Amoranthaceae
5	*Agave americana*	Gwarpatha	Amaryllidaceae
6	*Antigonon leptopus*	Coral Vine	Polygonaceae
7	*Boerhaavia diffusa*	Punaruara	Nyctaginaceae
8	*Bougainvillea glabra*	Bougainvellia	Nyctaginaceae
9	*Calotropis procem*	Aak	Asclepiadaceae
10	*Capparis decidua*	Karir	Capparidaceae
11	*Cassia occidentalis*	Kasunda	Caesalpiniaceae
12	*Cassia tora*	Panwar	Caesalpiniaceae
13	*Cleome viscosa*	Bagra	Capparidaceae
14	*Datura metel*	Kala Dhatura	Solanaceae
15	*Datura stramonium*	Dhatura	Solanaceae
16	*Euphobia hirta*	Dudhi	Euphobiaceae
17	*Flacourtia indica*	Bilangada	Leguminosae
18	*Ipomoea fistulosa*	Besharam	Convonvulaceae
19	*Lantana camara*	Panchpuli	Verbenaceae

Sr. No.	SCIENTIFIC NAME	LOCAL NAME	FAMILY
20	*Opuntia dillenii*	Nagphani	Cactaceae
21	*Polygonum orientale*	Knot Plant	Polygonaceae
22	*Parthenium hysterophorus*	Gajar Ghass	Asteraceae
23	*Ricinus communis*	Arand	Euphorbiaceae
24	*Nerium odorum*	Kaner	Apocyanaceae
25	*Sida acuta*	Kharenti	Malvaceae
26	*Solanum xanthocarpum*	Kateri	Solanaceae
27	*Solanum nigrum*	Makoi	Solanaceae
28	*Solanum surattense*	Kakri	Solaceae
29	*Tribulus terrestris*	Gokhru	Zygophyceae
30	*Vitex negundo*	Bana	Verbenaceae
31	*Urena lobata*	Bachita	Malvaceae
32	*Xanthium strumarium*	chota gokhru	Asteraceae
(C) Grasses, Hedges and Climbers:			
1	*Coccinia cordifolia*	Janglo	Cucurbitaceae
2	*Cuscuta reflexa*	Akash bel	Cosnopulaceae
3	*Capparis sepiaria*	Hins	Capparidaceae
4	*Cyperus bulbosus*	Kila	Cyperaceae
5	*Cyperus rotundus*	Dilla	Cyperaceae
6	*Cocculus pendulus*	Vallus	Merispermaceae
7	*Momordica charantia*	Jangli kasula	Cucurbitaceae
8	*Perguleria extensa*	Trotur	Asclepiadaceae
9	*Tinospora cordifolia*	Gilloh	Menispermaceae
10	*Andropogon annulatus*	Gandra	Poaceae
11	*Cenchugus biflorus*	Bhurat	Poaceae
12	*Chrysopogon fulvus*	Dhanlar	Pocaeae
13	*Cymbopogon*	Anjan	Pocaeae
14	*Cynodon dactylon*	Dubesha	Poaceae
15	*Dichanthium*	Talwan	Poaceae
16	*Desmostachys*	Dub	Poaceae
17	*Echinochloa colorium*	China	Poaceae
18	*Erianthus munja*	Kana	Poaceae
19	*Imperata cylindrica*	Siris	Poaceae
20	*Panicum colonum*	Sanuak	Poaceae
21	*Saccharum munja*	Kans	Poaceae
22	*Sporobolus marginalus*	Chiria	Poaceae
23	*Vetiveria zizanoides*	Khas	Poaceae

Source: Field survey by Vardan Team

2.5.4. PLANTATION FORESTRY

As the natural forest area was currently very poor in this district, enormous attempt has been made for raising plantation forestry in government as well as private land either

through social forestry programme or by organized strip plantation by the forest department. Over last two decades such attempts were undertaken. Many fast-growing trees, ornamental plants and also fruit trees were planted through these programmes. Usually through mass strip plantation programme along the railway line, road, canal bank, drain bank, and also even in degraded notified forest land, a considerable volume of wood biomass was expected in this area. Four major plant categories were used for this purpose viz. Shisam, Kikar, Eucalyptus, and other mixed types.

In addition various private land and also panchyat areas were taken up for social forestry programmes. A total of more than twenty five plant species were regularly utilized for planting in this programme during onset on monsoon period. The details of plant species used in the social forestry programmes are given in the **Table-4**. Among them once again the most prevalent species that are used for these purposes were Kikar, Eucalyptus, Khair, Shisham, Teak and Neem.

Table: 4 Major Plant Species Used For Social Forestry Plantation in Palwal

Sr. No.	Common Name	Botanical Name
1.	Babul	*Acacia nilotica*
2.	Safeda	*Eucalyptus cameldulensis*
3.	Khair	*Acacia Senegal*
4.	Aam	*Mangifera indica*
5.	Jungle Saru	*Casuarina equisetifolia*
6.	Gulmohar	*Delonix regia*
7.	Bahera	*Terminalia balerica*
8.	Subabul	*Leucenea leucocephala*
9.	Arjun	*Terminalia arjuna*
10.	Neem	*Azadirachta indica*
11.	Jamun	*Sizygium cuminii*
12.	Shisham	*Dalbergia sissoo*
13.	Papri	*Holoptelia integrifolia*
14.	Asan	*Terminalia tomentosa*
15.	Kassod	*Cassia siamea*
16.	Amrood	*Psidium guajava*
17.	Teak/Sagwan	*Tectona grandis*
18.	Kachnar	*Bauhinia variegata*
19.	Bakain	*Melia azadirachta*
20.	Poplar	*Populas deltoids*
21.	Khejri	*Prosopis juliflora*
22.	Imli	*Tamarindus indica*
23.	Mull berry	*Morus alba*

2.5.4.1.Plants of Economic Importance:

A good number of plants found in this area having enormous importance as medicine & other allied uses. There are listed in **Table-5**. However none of the plants can be considered as rare & endangered as suggested by IUCN. There is no wild germplasm stock in the area under survey.

Table: 5 Plants of Medicinal Importance & Other Allied Uses

Sr. No.	Botanical Name	Local Name	Part Used
1.	*Alstonia scholaris*	Saptparni	Bark
2.	*Azadirachta indica*	Neem	Seed, Leaf, Bark
3.	*Bombax ceiba*	Semal	Fruits
4.	*Butea monosperma*	Palash	Flower. Leaf
5.	*Erythrina arborescens*	Roringe	Flower, Bark
6.	*Moringa oliefera*	Sainjna	Flower, Fruit, Leaf
7.	*Syzygium cumini*	Jamun	Fruit, Bark
8.	*Tamarindus indica*	Imli	Fruit
9.	*Terminalia arjuna*	Arjun	Bark
10.	*Terminalia belerica*	Bahera	Fruit, Bark
11.	*Zizyphus mauritiana*	Ber	Fruit
12.	*Achrantus aspera*	Latjeera	Whole plant
13.	*Adhatoda vasica*	Adusa	Leaf
14.	*Datura metal*	Dhatura	Seeds
15.	*Sida acuta*	Baraira	Whole Plant
16.	*Solanum xanthocarpum*	Kateri	Fruits
17.	*Tribulus terrestris*	Gokhru	Whole plant
18.	*Vitex negundo*	Bana	Leaf
19.	*Vetiveria zizanoides*	Khas	root

2.5.4.2.Agriculture:

Quite a good number of crops were grown in this area. The major crops are paddy, jowar, bajra, makai and sugarcane in kharif seasons, while that of Rabi seasons crops are wheat, barley, sunflower, arahar, mung, chana, masoor, rapeseed, pea and barseem. The average yield rate of paddy and wheat are 20-25 Q/ha and 36-37 Q/ha respectively. The cultivation in this area is highly mechanized and there are profound facilities for canal and deep tube well irrigation. The farmers also use both chemical and bio-fertilizer in adequate quantity.

2.5.4.3.Grasslands:

No prominent grass land ecosystem has been found in core and buffer zone of the project. However the grass lands were mixed with natural vegetation in low lands and cultivable waste lands are now being utilized as grazing grounds to the livestock species: Goat, Cow, Ox and Buffalo. The grass species and sedges of core and buffer zone are listed below with the natural vegetation of buffer zone.

2.5.4.4.Endangered/Endemic Flora:

No endangered and endemic flora was recorded from core and buffer zone of the project area.

2.5.4.5.Location of National Park/Sanctuaries:

There is no Bio-sphere Reserve, National Parks, Wildlife Sanctuary, Tiger Reserve and Elephant Reserve within 10 km radius of the project site.

2.5.4.6.Waste Land:

Wasteland has developed in the area where the soil conditions are poor and under high biotic pressure. Places where soil conditions are not appropriate to support plant growth are commonly seen in the area. All such areas are either without any vegetation or are covered with species like *Acacia nilotica, Prosopis juliflora, Lantana camara, Calotropis procera, Zyziphus mauritiana, Leonotis nepetifolia, Xanthium straumarium*, etc.

2.5.5. WETLAND/MARSH LAND DIVERSITY

Wetlands are very useful to us. By producing resources, enabling recreational activities and controlling flood and pollution, they contribute to the national and local economies and environmental consequences. Wetlands provide important and incredible services to society, these services can neither be sold nor do they have the market value and tried to give wetlands an economic value.

Table 6: Wetland/Marshland Diversity of Study area

Family	Botanical Name	Local Name
Salviniaceae	*Azolla pinnata*	Mosquito Fern
Asteraceae	*Caesulia axillaris*	Maka
Ceratophyllaceae	*Ceratophyllum demersum*	Hornwort

Family	Botanical Name	Local Name
Poaceae	*Chrysopogon zizanioides*	Vetiver
Poaceae	*Coix lacryma-jobi*	Adlay Millet
Araceae	*Colocasia esculenta*	Taro
Commelinaceae	*Commelina benghalensis*	Kana
Cyperaceae	*Cyperus alternifolius*	Umbrella Sedge
Dryopteridaceae	*Dryopteris filix-mas*	Fern
Dryopteridaceae	*Dryopteris sieboldii*	Fern
Poaceae	*Echinochloa colona*	Shama
Pontederiaceae	*Eichhornia crassipes*	Jal Kumbhi
Asteraceae	*Grangea maderaspatana*	Madras Carpet, Mustaru
Acanthaceae	*Hygrophila salicifolia*	---
Convonvulaceae	*Ipomea aquatic*	Kalmi Shak
Lemnaceae	*Lemna minor*	Duck Weed
Onagraceae	*Ludwigia adscendens*	Water Primrose
Marsileaceae	*Marsilea quadrifolia*	Four Leaf Clover
Sterculiaceae	*Melochia corchorifolia*	Bilpat
Nelumbonaceae	*Nelumbo nucifera*	Lotus, Kamal
Nymphaeaceae	*Nymphaea pubescens*	White Lotus
Oxalidaceae	*Oxalis corniculata*	Amrul
Pandanaceae	*Pandanus odoratissimus*	Keora
Urticaceae	*Pilea microphylla*	Gun Powder Plant
Polygonaceae	*Polygonum hydropiper*	Marsh Pepper Knot Weed
Portulacaceae	*Portulaca oleracea*	Little Hog-Weed
Potamogetonaceae	*Potamogeton natans*	Floating Pond Weed
Lythraceae	*Trapa natans*	Water Chest Nut
Ranunculaceae	*Ranunculus sceleratus*	Aglaon
Polygonaceae	*Rumex dentatus*	Ambavati
Typhaceae	*Typha angustata*	Patera
Lentibulariaceae	*Utricularia gibba*	Floating Bladderwort

Family	Botanical Name	Local Name
Plantaginaceae	*Veronica anagallis-aquatica*	Water Speedwell

2.5.6. FAUNAL DIVERSITY

To prepare a detailed report on the status of wildlife biodiversity within 10 km radial area from the project site to assess the impacts due to the project activity and evolve suitable mitigation measures to protect and conserve wildlife biodiversity following components were studied:

a) Wildlife Survey (Diversity)

b) Habitat Study (Feeding, Breeding and Roosting areas)

c) Distribution/Status of Birds

d) Rare & Endangered species of Fauna

e) Specific local characteristics of biodiversity in the study area.

2.5.6.1 Methodology for Faunal Diversity

A linear transect of 1.0 km each was chosen for sampling at each site. Each transect was trekked for 1.5 hr for the sampling of faunal diversity through following methods for different categories. For the sampling of butterflies, the standard 'Pollard Walk' method was employed and all the species recorded daily. Voucher specimens of the species that could not be identified in the field were collected using a butterfly net besides photographing them.

For bird's sampling, 'Point Sampling' along the fixed transect (Foot trails) was carried out. All the species of birds were observed through a binocular and identified with the help of field guide book and photographs.

For the sampling of mammals, direct count on open width (20m) transect was used. In addition, information on recent sightings/records of mammals by the villagers/locals was also collected. For carnivores, indirect sampling was carried out and the mammals were identified by foot marks, faeces and other marks/sign created by them. In case of reptiles mainly lizards were sampled by direct count on open width transects.

The study of fauna takes substantial amount of time to understand the specific faunal characteristic of area. The assessment of fauna has been done by extensive field survey of the area. During survey, the presence of wildlife was also inhabitants depending on

animal sightings and the frequency of their visits in the project area which was later confirmed from forest department, Wildlife Department etc.

Table 7: Faunal Diversity from Study Area

S. No.	English Name	Scientific Name	Status/Schedule
Mammals			
1.	Black Rat	*Rattus rattus*	Schedule-V
2.	Common Mangoose	*Herpestes edwerdsii*	Schedule-II
3.	Five Striped Palm Squirrel	*Funambulus pennanii*	Schedule-IV
4.	Little Indian field mouse	*Mus booduga*	Schedule-V
5.	Indian Hare	*Lepus nigricollis*	Schedule-IV
6.	Monkey	*Maccaca mulata*	Schedule-II
7.	Jackal	*Canis aureus*	Schedule-II
8.	Bat	*Rousettus leschenaultia*	Schedule-V
9.	Common Langur	*Semnopithecus entellus* [LC]	Schedule-II
10.	Common mangoose	*Herpestes edwerdsii*	Schedule-II
Amphibians			
11.	Indian pond frog	*Rana hexadactyla*	Schedule-IV
12.	Common Indian Toad	*Duttaphrynus melanostictus*	Not Listed
13.	Indian Bull Frog	*Hoplobatrachus tigerinus*	Schedule-IV
14.	Indian Skipper Frog	*Euphlyctis cyanophlyctis*	Schedule-IV
15.	Toad	*Bufo bufo*	Not Listed
16.	Indian Cricket Frog	*Rana limnocharis*	Schedule-IV
17.	Common Frog	*Rana tigrina*	Schedule-IV
Reptiles			
18.	House gecko	*Hemidactylus flavivridis*	Common
19.	Common garden lizard	*Calotes versicolor*	Common
20.	Brahminy skink	*Mabuya carinata*	Common
21.	Indian Cobra	*Naja naja*	Schedule-II
22.	Rat Snake	*Ptyas mucosa*	Schedule-IV
23.	Garden Lizard	*Calotes versicolor*	Not Listed
Butterflies			
24.	White orange tip	*Ixias marianne*	Common
25.	Lime butterfly	*Papilio demoleus*	Common
26.	Common crow	*Euploea core*	Common
27.	Common map	*Cyrestis thyodamas*	Common
28.	Common mormon	*Papilio polytes*	Common
29.	Common Grass Yellow	*Eurema hecabe*	Fairly Common
30.	Stripped Tiger	*Danaus genutia*	Common
31.	Danaid Egg Fly	*Hypolimanas misippus*	Common
32.	Common Bush Brown	*Mycalesis perseus*	Common
Aves			
33.	House Crow	*Corvus splendens*	Schedule-V
34.	Rock Pigeon	*Columba livia*	Common

S. No.	English Name	Scientific Name	Status/Schedule
35.	Jungle babbler	*Turoides striatus*	Schedule-IV
36.	Common Myna	*Acridotheres tristis*	Schedule-IV
37.	Green bee-eater	*Merops orientalis*	Least Concern
38.	Indian roller	*Coracias benshalensis*	Schedule-IV
39.	Black Drongo	*Dicrirus macrocercus*	Schedule-IV
40.	Little cormorant	*Microcarbo niger*	Schedule-IV
41.	Common swift	*Apus apus*	Schedule-IV
42.	House swift	*Apus affinis*	Schedule-IV
43.	Cattle Egret	*Bubulcus ibis*	Schedule-IV
44.	Little Egret	*Egretta garzetta*	Schedule-IV
45.	Pond heron	*Ardeola grayii*	Schedule-IV
46.	Red wattled lapwing	*Vanellus indicus*	Schedule-IV
47.	Ring dove	*Streptopelia decaocto*	Schedule-IV
48.	Spotted Dove	*Streptopelia chinensis*	Schedule-IV
49.	White Breasted Kingfisher	*Halcyon smyrnensis*	Schedule-IV
50.	Blue Cheeked Bee Eater	*Merops persicus*	Schedule-IV
51.	Asian Koel	*Eudynamys scolopacea*	Schedule-IV
52.	Indian Robin	*Saxicoloides fulicata*	Schedule-IV
53.	Pied Bush Chat	*Saxicola caprata*	Schedule-IV
54.	Purple Sun Bird	*Nectarinia asiatica*	Schedule-IV
55.	Small Sun Bird	*Nectarinia minima*	Schedule-IV
56.	House Sparrow	*Passer domesticus*	Schedule-IV
57.	Grey Tit	*Parus major*	Schedule-IV
58.	Red Vented Bulbul	*Pycnonotus cafer*	Schedule-IV
59.	Bank Myna	*Acridotheres ginginianus*	Schedule-IV
60.	Common Babbler	*Turdoides caudatus*	Schedule-IV
61.	Tailor Bird	*Orthotomus sutorius*	Schedule-IV
62.	Rose Ringed Parakeet	*Psittacula krameri*	Schedule-IV
63.	Baya	*Ploceus philippinus*	Schedule-IV
64.	Owl	*Bubo bubo*	Schedule-IV
65.	Black Ibis	*Pseudibis papillosa*	Schedule-IV
66.	Whistling duck	*Dendrocygna javanica*	Schedule-IV
67.	Pea fowl	*Pavo cristatus*	Schedule-I
68.	Titar	*Ortygornis pondicerianus*	Schedule-IV
69.	Bater	*Coturnix coturnix*	Schedule-IV

Reference: For Avifauna: The book of Indian Birds by Salim Ali (1948)
For Amphibians: Atlas of amphibians, Published by Zoological Survey of India, Kolkata (September, 2013)

2.5.6.2 Endangered Species

69 species of vertebrates could be seen in the vicinity of the proposed project. Only one Schedule I i.e. *Pavo cristatus*, under Wildlife Protection Act, 1972, have been reported from the study area. Although these are very common species and found in every locality, even in villages, certain steps should be taken to conserve the critical wild life:

I. Programs for the conservation of wildlife will be formulated and implemented outside the protected areas by educating the local communities with help of local public agencies, and other stakeholders including the environment division officers of our company, in order to reduce the scope of man-animal conflict.

II. It will be ensured that human activities on the fringe of the protected areas do not degrade the habitat.

Over all, the status of wildlife in a region is an accurate index of the state of ecological resources, and thus, of the natural resources base of human well-being. This indicates the interdependent nature of ecological entities (the web of life), in which wild life is a vital link and a base of eco-tourism. Thus, the importance of conserving and protecting wildlife will be spread among the local people.

2.5.7. AQUATIC ECOLOGY:

There are a number of canals and drains connected with river Yamuna. Aquatic biotic communities like Phytoplanktons and Zooplanktons, Macrophytes and Fishes were studied.

2.5.7.1.Methodology for Aquatic Diversity:

The samples for qualitative and quantitative analysis of planktons were collected from the sub surface layer at knee depth. Water samples were filtered through plankton net of 20µ mesh size (APHA, 1971). The filtered samples were concentrated by using the centrifuge. By using Lackey's drops method and light microscope (Lackey, 1938), the qualitative analysis was carried out for phytoplankton and zooplankton. The standard flora and other literature were followed for the qualitative evaluation of Plankton.

2.5.7.2.Planktons:

Two sites were selected for plankton analysis. These are (i) Yamuna River as upstream point, (ii) Yamuna River as downstream point. The detail of planktonic diversities is given in **Table-8**.

Table 8: List of Phytoplankton & Zooplanktons from Study Area

PHYTOPLANKTON	ZOOPLANKTONS
Achnanthes sp.	*Arcella sp.*
Ankistrodesmus sp	*Keratella sp.*

PHYTOPLANKTON	ZOOPLANKTONS
Ceratium sp	*Asplancha sp.*
Euglena sp.	*Brachonus sp.*
Melosira sp.	*Daphnia sp.*
Microcystis sp.	*Cyclops sp.*
Navicula sp.	*Cypris sp.*
Nitzschia sp.	**ROTIFERA**
Oscilaltoria sp.	*Asplanchna intermedia*
Pediastrum sp.	*Brachionus falcatus*
Pinnularia sp.	*Filinia longiseta*
Pleurosigma sp.	*Keratella tropica*
Scenedesmus sp	
Spirulina sp.	
Volvox sp.	

2.5.7.3.Fisheries:

The pisciculture activities were restricted only in the Yamuna River, canals and village ponds. The culture fisheries were common practices in the confined water bodies over the years. Transported fish seeds core supplied by State Fisheries Department to the villagers and commercial entrepreneurs for pisciculture in confined water bodies. The yield rate is fairly high. The major carps like Rahu (*Labeo rohita*), Catla (*Catla catla*), Mrigal (*Cirrhina mrigala*) and Cyprinus carp (*Cyprinus carpio*) were primarily cultured.

With respect to capture fisheries, a good number of fishes were reported to be captured from rivers and canal system in particulars. The major fishes were species of Mystus, Channa, Silonia, Rita and Puntius etc.

Table 9: Fishes found in the Study Area

SN	Common Name	Scientific Name
1.	Pholus	*Notopterus notopterus*
2.	Chital	*Notopterus chitala*
3.	Chela	*Salmostoma bacaila*
4.	Katla	*Catla catla*
5.	Mrigal	*Cirrhina mrigala*
6.	Chunni	*Cirrhina reba*
7.	Bata	*Labeo bata*
8.	Siriha	*Labeo gonius*
9.	Rohu	*Labeo rohita*

10.	Magur	*Clarias batrachus*
11.	Singhara	*Mystys seenghala*
12.	Ghally	*Ompok bimaculatus*
13.	Mallee	*Wallago attu*
14.	Dolla	*Channa punctatus*
15.	Curd	*Channa striatus*

CHAPTER-3: CONSERVATION ACTION PLAN FOR WILDLIFE

3.1. CONSERVATION PLAN FOR FAUNA REQUIRES KNOWLEDGE ON

1) Home range of the animal
2) Territorial requirement of the animal
3) Deciding the number of animals to be conserved and accordingly evaluating the carrying capacity of the habitat
4) Conservation is aimed at single species or multiple species
5) Conservation is proposed in a managed ecosystem or an un-managed, natural ecosystem
6) However, very little knowledge exists on the above parameters of most of the animals.

3.2. REASONS FOR DECLINE OF WILDLIFE

Several reasons for the decline of wild life and methods for their conservation are proposed. However the best method for the conservation of wild life is related directly to the maintenance of ecosystems in their natural condition, allowing their natural development and protection to the wildlife and their habitat. Both these phenomena (ecosystem development and habitat protection) are related to anthropogenic factors. Some of the important anthropogenic factors are listed below:

I. Habitat fragmentation and destruction
II. Man animal conflict
III. Forest fire
IV. Poaching
V. Stake holders dependence on forest resources
VI. Creating awareness amongst forest stake holders
VII. Water scarcity

3.3. CONSERVATION ACTION PLAN FOR SCHEDULE-I SPECIES

Biodiversity conservation plan is developed with the aim to reduce adverse impact on the natural habitat of various wild animals. Day by day issues related to threats to natural terrestrial and aquatic ecosystems arises due to high anthropogenic activities and loss of natural habitat due to climate change. A conservation plan is needed for the conservation of critical habitats of wildlife for endangered and schedule-I species along with their scientific management strategy. During the mining/industrial/developmental activities

and conservation activities, natural resources (Land, Biodiversity, Forest, Animals and Humans) are likely to expert tremendous pressure due to various activities in the respective region, while the present management plan will ensure mitigation of such impacts. A separate Wildlife conservation Plan is proposed for M/s M.M. Traders for sand mining project from the riverbed of Yamuna River of district – Palwal, Haryana.

3.3.1. INDIAN PEAFOWL (*Pavo cristatus*):

The Indian Peafowl (*Pavo cristatus)*, is also known as the Common Peafowl or the Blue Peafowl. The peacock is the **national bird** of India.

Habitat: It is found in forests, but can live also in cultivated regions and around human habitations and is usually found where water is available.

Food: It is an omnivorous bird. It's diet consists of small mammals like: mice, reptiles like lizards and snakes, amphibians, arthropods like: insects, ticks, termites, ants, locusts and scorpions, seeds, fruit, vegetables, flowers, leaves, and minnows in shallow streams and so on. With its strong bill it is able to kill a snake, even a cobra. Around cultivated areas, peafowl feed on a wide range of crops such as groundnut, tomato, paddy, chilly, and even bananas. Around human habitations, they feed on a variety of food scraps and even human excreta.

Threat: Poaching of peacocks for their meat, feathers and accidental poisoning by feeding on pesticide treated seeds are known threats to wild birds. Methods to identify if feathers have been plucked or have been shed naturally have been developed as Indian law allows the collection of feathers that have been shed. However, presently, there is no severe threat to this species, primarily for its status as a National bird and secondarily due to religious belief this species is protected. But its train feathers are in great demand for commercial purposes and are the main threat to its survival. Their loud calls make them easy to detect, and in forest areas, often indicate the presence of a predator such as a tiger.

Conservation: They are generally protected by religious sentiment and will forage around villages for scraps. The people living in the surrounding area should be rewarded for timely information about disturbing and/or poaching of the bird. The bird has a wide range of food items, hence, improvement of and protection of the bird in the buffer zone will provide sufficient food to the animal.

Conservation Status: IUCN Red List, Least Concern species, and Schedule-I species under Indian Wildlife (Conservation) Act, 1972.

3.4. CONSERVATION MEASURES

It is critical that urgent efforts are made to understand the habitat and population status of the species through field based research and *in situ* conservation projects. A meeting of the Indian Board for Wild Life (held on 19 June 2006) underlined the need for such efforts. The actions required are:

1) Mapping of habitat and distribution status of the species across the country, inside and outside protected areas;
2) Time series analysis of habitat change to quantify the rate of change and identify high-risk areas and potential sites for further affirmative action;
3) Estimation of population size by established count methods such as line transect, call counts and roost counts;
4) Intensive ecological investigations in representative sites in major biogeographic zones with focus on the effects of threats in relation to breeding success and survival probability;
5) Quantification of trade, with details on source and people involved; and
6) Undertaking outreach activities to sensitize local communities, this may be carried out by a network of 'student clubs' (e.g. National Green Corps) throughout the country. These people could be trained to collect population data and undertake monitoring within their localities, and the reliability of the results could be ensured by adopting rigorous protocols.

3.4.1. ELIMINATION OF MAN ANIMAL CONFLICT

Man-animal conflict is a difficult problem to be eliminated. The conflict is both deliberate as well as inadvertent. However, conflict can be minimized through employing local persons to form anti-depredation team. The conflict can be minimized also through protecting the area, preventing the entry of human beings or the cattle in the area. First aid facilities should be provided in the villages to meet exigencies in case of any conflict.

3.4.2. DUST CONTROL

All transport roads of the project passing through buffer zone shall be kept wet by sprinkling of water at required intervals. The frequency of watering will be based on season and weather conditions. This will reduce and minimize the impact of dust on flora/fauna.

3.4.3. PROTECTION & IMPROVEMENT OF HABITAT

The patches of forest that forms the habitat of wildlife is threatened due to anthropogenic pressure generated due to the construction/operation and other ancillary activities. Hence, concerted and vigorous efforts will be made to protect such forest patches. Besides, improvement of vegetation cover on Non-Forest land in the buffer zone will be tried.

3.4.4. PREVENTION OF FOREST FIRE

Forest fire is caused both naturally as well as by the human beings. Anthropogenic causes will be minimized through forming a fire line around the forest area. To add to the prevention of fire local persons will be employed as fire guards, during the fire prone season. The team will be instructed to fight the fire as soon as it is detected. Watch towers will also be constructed to detect forest fire. Awareness program against forest fire will also be run in adjoining villages.

3.4.5. REDUCING STAKE HOLDER'S DEPENDENCE ON FOREST PRODUCES

People from adjoining villages have already exploited the forest to the extent that the forests have become a grazing land or a source of fuel wood. Timber and medicinal species have either disappeared or have become scarce. However, regenerating the forest will again attract the villagers towards the forest. To keep the people away from the forest their economic condition will be improved. This will be achieved through financial and technical help to develop Dairy, Poultry, Vegetable cultivation, Horticulture and Agroforestry. Promotion of agro-forestry, in particular, will reduce their dependence on forests for timber as well as for fuel wood.

3.4.6. WATER AVAILABILITY

However, due to lack of proper storage, severe water scarcity develops during the summer season. To make the water available throughout the year it is essential to create

water storage facility. Multiple water storage places will be created in the Buffer zone through improving the existing ponds, constructing check dams in the water channels and through creating water holes. Also, camouflage and hiding places should be created. Some wildlife species fulfill their salt requirement through licking the soil. Salt deposits will be arranged for such species adjacent to the water holes. These water holes will also be helpful in recharging the ground water and thus will be supporting good growth of the vegetation.

3.4.7. SALT LICKS

As natural salt is very scarce in the area and salt is a very essential requirement for the wild animals particularly the herbivores. Five such saltlicks may be created artificially and maintained for use of wild animals near the water hole and grass lands. Clay soil will be mixed with salt mixture in 3:1 ratio. Salt mixture will be prepared by mixing of 95 kg common salt, 3 kg rock salt and 2 kg trace mineral mixture.

CHAPTER-4: ACTION PLAN AND FINANCIAL PROJECTION

4.1. INTRODUCTION

Protected areas and threatened species could most effectively be safeguarded if local people considered it in their own interest to do so. Working with rather than against local people has become a major working principle for IUCN. For the protection of habitat sensitive wildlife and other living form need proper action plan and budgetary allocation which will be a roadmap for the success of conservation scheme.

4.2. ACTION PLAN

4.2.1. NON-FORMAL EDUCATION

Conservation education and awareness will be imparted both at the formal and non-formal levels. At the formal level, it will be given at school, colleges and university levels. Formal education, in spite of all the curriculum development and introduction of the study of ecology, wildlife and conservation at the school and college levels, however, largely remains text book and examination oriented. Because of the situation, non-formal education becomes all the more necessary for creating the right kind of awareness and attitude among people at all levels- children, teenagers, adults, family groups, teachers, administrators, politicians and policymakers. To achieve this some local tours of school and college students will be arranged to nearby National Parks.

4.2.2. INSTITUTIONAL INFRASTRUCTURE

The prime requisite for building up an understanding and awareness about wildlife and conservation is to develop an appreciation, respect and love for nature. Most people lack the curiosity to know even the names of animals and plants they come across in their day to day life. Development of an inquisitive mind, a keen sense of observation and curiosity about the fauna and flora are, therefore, very important. Concern for conservation can only emanate from a love for nature and awareness about the interdependence of all species of animals and plants, including the man. To arouse curiosity about the wildlife some quiz and essay competitions will be arranged in the schools and colleges of the buffer zone and some nearby areas.

4.2.3. RESCUE & REHABILITATION CENTRE

The Government of India has put a ban on performance of lion, tiger, panther, bear and monkeys by circuses. Consequent to the ban, these animals were to be rehabilitated by creating appropriate facilities. As Indian Zoos did not have adequate facilities to rehabilitate all these animals, the Central Government decided that rescue centers should be created by the Central Zoo Authority for the display areas of the various zoos.

The M/s M.M. Traders will establish a suitably equipped Mobile Units (one member) as per the consultation with Forest Department in districts having high levels of Human-Wildlife Conflict (HWC) to attend to wildlife emergencies, rescue and rehabilitation, and to provide wildlife health support.

4.2.4. ECO DEVELOPMENT WORKS

People in and around the forest area generally are hostile against the forest department and its staff, because they are prevented from taking out timber and other forest products illegally. Such antagonistic behavior is mainly because little effort is made to meet their genuine demands either from outside the forest area or from the forest area but in a sustainable manner. Regular interaction with them with agreement for sustainable utilization of forest resources combined with some incentives can completely change their indifferent or even un-concerned attitude to conservative attitude.

4.2.5. CHECKS & CONTROL ON THE MOVEMENT OF VEHICLE

Due to movement of vehicles injury to animals and reptiles may take place. For this reason speed limit of vehicles will be fixed and operators will be educated and advised regularly to drive vehicle safely and slowly. All operators will also be advised to stop the vehicle on seeing such reptiles or animals and let it go away before moving the vehicle further.

4.2.6. PRESSURE HORN & HEAD LIGHTS

Noise generated by pressure horn disturbs the wildlife and forces them to leave the place. No pressure horn will be fixed on vehicle plying in the area. All the drivers will be advised to make minimum use of horn while working hours.

Efforts will be made to cover the lights suitably with paint so that strong beam of head light is not formed and light falls in front of the vehicle only.

4.2.7. ENCOURAGE LOCAL VILLAGERS TO GROW TREES ON THEIR ON THEIR FIELD BOUNDS/COURT YARDS

In consultation with Forest Department the company will provide some finance, to grow saplings of tree species, having importance for wood, small timber and fuel wood to distribute to the villagers. Bamboo will be another important species with a lot of environmental and economic value. This no doubt will help reduce dependence of people on RF/PF forest; as a result the ecological condition of the area will improve so the wild life will be attracted to this area.

4.2.8. REDUCING ENVIRONMENTAL POLLUTION

To keep the environment frees from smoke, cooking gas cylinders will be provided to all the project workers particularly. To control pollution from project measure outlined in EMP will be followed.

4.2.9. PROVIDE EMPLOYMENT TO THE VILLAGERS

On the basis of their suitability, jobs in project will be provided to the nearby villagers. As a result their economic condition will improve. This well keep they busy also, so they will not be tempted/compelled to cause destruction to forest which will help improve the status of wildlife.

4.2.10. PLANTATION IN THE BUFFER ZONE

Trees will be planted in the buffer zone also. This plantation will be done at selected places only and only local species will be used in the plantation. Some of the tree species included will be Saja (*Terminalia tomentosa*), Baheda (*Terminalia bellerica*), Bija (*Pterocarpus masupium*), Bargad (*Ficus benghalensis*), Peepal (*Ficus religiosa*), Neem (*Azadirechta indica*), Sal (*Shorea robusta*), etc. Care will be taken to include some fruit bearing trees like Gular (*Ficus glomerata*), Aonla (*Emblica officinalis*), Aam (*Mangifera indica*) and such trees to provide food to the herbivores which in turn will be the food source of the carnivores. Water, particularly during drier seasons, becomes the most important factor to all types of wild animals including the mammals, birds and reptiles. If water is available safely, then all other factors become secondary for the presence and survival of the wild life in any forested area. Places suitable for mini watersheds will be identified in the core as well as in the buffer zone to store rainwater.

Further, to make water available at all the times, throughout the year, some of these water holes will be recharged through artificial means. Proper slope will be given to approach these water sources so that the wild animals will be able to drink water without any difficulty. Proper cover through vegetation or any other type of even artificial cover will be developed near to these water sources so that the prey species will be able to hide themselves from the predators, at the time of approaching the water sources. To attract the birds, plants yielding food to the birds will be planted on priority basis. If water and food are available to the birds without any anthropogenic disturbances the area can become an ideal place for bird watching.

4.3. FINANCIAL PROJECTION

Rs. 10.00 Lakhs (excluding Plantation inside plant premises will be done as per ToR (33% of total land and commitment as per public hearing) has been allocated towards conservation of scheduled fauna in the area for the implementation of conservation proposal.

Table 11: Budget for Conservation/Management Plan

S. No.	Component	Budget in Rs (Lakh)
1	Planting of trees groves in surrounding area and Promotion of agro forest in villages planting fruits trees	**5.00**
2	Artificial nests, feeding and watering arrangement for animals	**1.00**
3	Workshops, Training and awareness programs	**1.00**
4	Water supply	**1.00**
5	Salt Licks	**1.00**
6	Contingency	**1.00**
Total		**10.00**

Yearly distribution of Budget (In Lakhs)

Year	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year
Provision in Lakhs	2.00	1.50	1.00	0.50	1.00	0.50	0.50	1.00	0.50	0.50

Annexure-1

PICS OF ANIMALS

	
Black Ibis	Common Moorhen
	
Pond Heron	Water Cormorant
	
Five Striped Palm Squirrel	Common Langur

BUFFER ZONE

	
Eucalyptus Plantation	Mustard Cultivation
	
Poplar Plantation	Maize Cultivation
	
Sugarcane Cultivation	Wheat Cultivation

ANNEXURES – 10.1

CA CERTIFICATE FOR PROJECT COST

2610816/2023/Estt.Br

HEMANT THAKRAL & CO.
Chartered Accountants

HOUSE NO 2159, SECTOR 13, U.E.
KARNAL-132001 MOBILE NO: 9466508989
E-mail:hemant.thakral@icai.org

TO WHOMSOEVER IT MAY CONCERN

Based on the books of account, documents and other information provided to us of **M/S M. M. Traders.** having registered office at Village Manglora Quidem, Karnal, Haryana 132037, We hereby confirm that department of mines & Geology, Haryana has awarded a contract in respect of "Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ year production over an area of 25.06 ha located at Village Sultanpur & Atwa, Tehsil & District Palwal and State Haryana" to the firm.

Further, we hereby confirm that the total estimated project cost of river sand mine project is INR 10.18 Crores (INR Ten Crores & Eighteen Lakhs Only) considering plant & machinery and other equipment will be hired basis for the purpose of project operation.

Breakup of Project cost estimation on Plant & Machinery, Construction of site office & workshop, Utility vehicles and other miscellaneous assets is given below: -

S. No.	Particulars	Amount (In Rs. Lakhs)
1	Land Cost	0
2	Department Expenditure against Lease	502.00
3	Security	114.00
4	Projected Working Capital	200.00
5	Projected Plant & Machinery Cost	190.00
6	Miscellaneous	12.00
	TOTAL PROJECT COST	**1018.00**

The above statement is true and correct as per records, documents produced, and other information provided by the management for verification.

This certificate has been provided at the request of the firm.

Hemant Thakral
Chartered Accountants
M. NO. 506206

ANNEXURES – 12.1

QCI NABET CERTIFICATE (ENVIRONMENT CONSULTANT)

2610816/2023/Estt.Br

QUALITY COUNCIL® OF INDIA
Creating an Ecosystem for Quality

National Accreditation Board for Education and Training

Certificate of Accreditation

Parivesh Environmental Engineering Services

5/916, Viram Khand, Gomti Nagar, Lucknow, Uttar Pradesh-226010

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

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals- opencast mining only	1	1 (a) (i)	B
2	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
3	Cement plants	9	3 (b)	A
4	Synthetic organic chemicals industry	21	5 (f)	A
5	Ports, harbours, break waters and dredging	33	7 (e)	B
6	Highways,	34	7 (f)	B
7	Building and construction projects	38	8 (a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IAAC minutes dated January 4, 2022 and Supplementary assessment minutes dated April 22, 2022 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/22/2295 dated April 1, 2022. The accreditation needs to be renewed before the expiry date by Parivesh Environmental Engineering Services, Lucknow following due process of assessment.

Sr. Director, NABET
Dated: May 12, 2022

Certificate No.
NABET/EIA/2124/IA 0092(Rev.01)

Valid up to
November 11, 2024

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

ANNEXURES – 12.2

MOEF&CC CERTIFICATE (LABORATORY)

2610816/2023/Estt.Br

रजिस्ट्री सं. डी.एल.- 33004/99 REGD. No. D. L.-33004/99

भारत का राजपत्र
The Gazette of India

सी.जी.-डी.एल.-अ.-02062021-227331
CG-DL-E-02062021-227331

असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 1977] नई दिल्ली, बुधवार, जून 2, 2021/ज्येष्ठ 12, 1943
No. 1977] NEW DELHI, WEDNESDAY, JUNE 2, 2021/JYAISHTHA 12, 1943

पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 1 जून, 2021

का.आ. 2131(अ).—केंद्रीय सरकार, पर्यावरण (संरक्षण) नियम, 1986, के नियम 10 के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 12 की उप-धारा (1) के खंड (ख) और धारा 13, द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए तत्कालीनs पर्यावरण और वन मंत्रालय का.आ 1174 (अ), तारीख 18, जुलाई, 2007, द्वारा भारत सरकार की अधिसूचना में निम्नलिखित और संशोधन करती है अर्थात् : -

उक्त अधिसूचना की सारणी में -

(i) क्रम संख्या 23, 36, 40, 44, 46, 48, 50, 51, 57, 67, 68, 70, 74, 99, 101, 106, 112, 119,127 और 138 और उससे संबंधित प्रविष्टियों के स्थान पर, क्रमशः निम्नलिखित क्रम संख्या और प्रविष्टियां रखी जाएंगी, अर्थात्:-

सारणी

क्र.सं.	प्रयोगशाला का नाम	सरकारी विश्लेषक के नाम	निम्नलिखित तारीख तक वैध मान्यता
(1)	(2)	(3)	(4)
“23	मैसर्स विट्रो लैब्स, # 2-2-647/ ए/3, 3	(i) श्री चौ. नरसिम्हा राव	01 जून, 2021

127	मैसर्स वर्धन एनरोलैब प्लॉट नंबर 82 / ए, सेक्टर -5, एचएसआईआईडीसी, आईएमटी, मानेसर, गुड़गांव -122051, हरियाणा	(i) श्री एस. शर्मा (ii) श्री गौरे प्रताप सिंह (iii) डॉ. शिव प्रकाश सिंह	01 जून , 2021 से 6 जनवरी, 2023
138	मैसर्स फूड हाइजीन एंड हेल्थ प्रयोगशाला, को सर्वे नंबर 126/10, प्लॉट नं. –1, हडपसर इंडस्ट्रियल एस्टेट, हडपसर, ताल - हवेली, जिला - पुणे -1013, महाराष्ट्र	(i) श्री रोहन देशपांडे (ii) सुश्री सीमा सतीश बाकडे (iii) सुश्री सुषमा महेश	01 जून, 2021 से 29 मार्च, 2024

(iii) **क्रम संख्या** 201 **और उससे संबंधित प्रविष्टियों के पश्चात, निम्नलिखित क्रम संख्या और प्रविष्टियां रखी जाएंगी, अर्थात:-**

क्र.सं.	प्रयोगशाला का नाम	सरकारी विश्लेषक के नाम	निम्नलिखित तारीख तक वैध मान्यता
(1)	(2)	(3)	(4)
"202	209 मेसर्स अज़ीस लैब्स प्लॉट नं –एम-43 सेक्टर -3, पीठमपुर जिला धार -454774, मध्य प्रदेश	(i) श्री रविशंकर सहाय (ii) श्री मनोज बामनीया (iii) सुश्री निकिता भंड	01 जून , 2021 से 28 फरवरी 2023
203	मेसर्स क्रिएटिव एनवायरो सर्विसेज, 42, दूर संचार नगर, सेवॉय कॉम्प्लेक्स अरेरा कॉलोनी के निकट भोपाल -462039, मध्य प्रदेश	(i) डॉ. जी.के. जैस (ii) श्री संतोष खंटल (iii) सुश्री अमृता मिश्रा	01 जून , 2021 से 11अक्टूबर, 2021
204	मेसर्स एशिया एनवायरो लैब, एच1-837, प्रदूषण बोर्ड के पास, चरण- II, रिको औद्योगिक क्षेत्र, भिवाड़ी, जिला- अलवर- 301019, राजस्थान	(i) श्री विक्रम सिंह (ii) श्री रोहताश	01 जून , 2021 से 23 दिसंबर, 2023
205	मेसर्स क्वालिटी रिसर्च और एनालिटिकल लैब्स. 341, ग्राउंड फ्लोर, कार्यात्मक औद्योगिक क्षेत्र, पटपड़गंज, नई दिल्ली -110092	(i) डॉ. गौरव माहेश्वरी (ii) मिस अनीता सिंह	01 जून , 2021 से 21अक्टूबर, 2023
206	मेसर्स दिल्ली एनालिटिकल रिसर्च प्रयोगशाला, प्लॉट नंबर 2, टिम्बर ब्लॉक, झिलमिल औद्योगिक क्षेत्र, दिल्ली-110095	(i) डा. प्रियंका मिश्रा (ii) श्री विनय गुप्ता (iii) श्री नाओ ज्योति कुमार गुप्त	01 जून , 2021 से 12 नवंबर, 2021
207	मैसर्स वर्धन एनरोलैब, प्लॉट नंबर - 24और 25, नारायण विहार, बीब्लॉक, मानसरोवर, जयपुर- 302035, राजस्थान	(i) श्री राजिंदर सिंह यादव (ii) श्री राज कुमार यादव (iii) श्री नेमी चंद चौधरी	01 जून , 2021 से 6 जनवरी, 2023
208	मैसर्स पर्यावरण परीक्षण लैब, दुकान नंबर 1, देना बैंक के पास, बास रोड, रामनगर, ददरुहेरा, रेवाड़ी -123106, हरियाणा	(i) श्री करतार सिंह (ii) श्री हेमराज	01 जून , 2021 से 23 मार्च, 2024
209	मैसर्स अल्टीमेट एनवायरोलाइटिकल समाधान, एचडीडी 272, चरण-3, जेपी	(i) श्री अनुराग के. श्रीवास्तव	01 जून, 2021 से

ADDITIONAL ANNEXURES

ADDITIONAL ANNEXURES – 1

UNDERTAKING OF CONSULTANT ENGAGEMENT

22N1ZY

(M) 90506-66710
(M) 92670-40000

M.M. TRADERS

Village Manglora, Near Manjeet Filling Station, Meerut Road,
KARNAL, Haryana -132001

Ref. No.....

Dated.....

UNDERTAKING

I, Mr. Vipin, Authorized Signatory of M/s M. M. Traders, having its registered office at Village Manglora Quidem, Karnal, Haryana, for the for the project - Proposed Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ year production over an area of 33.42 ha located at Village Sultanpur, Tehsil & District Palwal and State Haryana hereby authorize **Mr. Vikas Tripathi**, Director of **PARIVESH ENVIRONMENTAL ENGINEERING SERVICES** having it's office at 5/916, Vikram Khand, Gomti Nagar, Lucknow, Uttar Pradesh 226010, as Environment Consultant for the project.

For M/s M. M. Traders

For M.M. TRADERS

VIPIN

Auth. Sign.

Date & Place

ADDITIONAL ANNEXURES – 2

AFFIDAVIT BY CONSULTANT

2610816/2023/Estt.Br

Affidavit

Indian-Non Judicial Stamp
Haryana Government

Date : 07/11/2022

Certificate No. M0G2022K273

GRN No. 96110360

Stamp Duty Paid : ₹ 101

Penalty : ₹ 0

Deponent

Name : Vikas Tripathi
H.No/Floor : 916 Sector/Ward : 0 Landmark : Gomti nagar
City/Village : Lucknow District : Lucknow State : Lucknow
Phone : 88******06

Purpose : AFFIDAVIT UNDERTAKING M M TRADERSto be submitted at 5916vikram khand gomti nagar lucknow

The authenticity of this document can be verified by scanning this QrCode Through smart phone or on the website https://egrashry.nic.in

AFFIDAVIT CUM UNDERTAKING

I, Mr. Vikas Tripathi, Director of **PARIVESH ENVIRONMENTAL ENGINEERING SERVICES** having it`s office at 5/916, Vikram Khand, Gomti Nagar, Lucknow, Uttar Pradesh 226010, as Environment Consultant of **M/s M.M. Traders** for the project - Proposed Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ year production over an area of 33.42 ha located at Village Sultanpur, Tehsil & District Palwal and State Haryana do hereby solemnly affirm, declare and undertake that all the information in the proposal are being given are correct.

Deponent

Date & Place 07/11/2022
Lucknow

Verification:
The consent of the above undertaking is true and correct to the best of my knowledge as per record & nothing has been concealed.

Deponent

Date & Place
07/11/2022
Lucknow

PARIVESH ENVIRONMENTAL ENGINEERING SERVICES QCI ACCREDITED

ADDITIONAL ANNEXURES – 3

AFFIDAVIT BY PROPONENT

2610816/2023/Estt.Br

Affidavit

Indian-Non Judicial Stamp
Haryana Government

Date : 07/11/2022

Certificate No. M0G2022K244

GRN No. 96107881

Stamp Duty Paid : ₹ 101
(Rs. Only)

Penalty : ₹ 0
(Rs. Zero Only)

Deponent

Name : Vipin
H.No/Floor : 120 Sector/Ward : 0 Landmark : Ashoka nursery
City/Village : Karnal District : Karnal State : Haryana
Phone : 88******06

Purpose : AFFIDAVIT UNDERTAKING MM TRADERS **to be submitted at Ashoka nursery**

The authenticity of this document can be verified by scanning this QrCode Through smart phone or on the website https://egrashry.nic.in

AFFIDAVIT CUM UNDERTAKING

I, Mr. Vipin, Authorized Signatory of M/s M. M. Traders, having its registered office at Village Manglora Quidem, Karnal, Haryana, for the for the project - Proposed Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ year production over an area of 33.42 ha located at Village Sultanpur, Tehsil & District Palwal and State Haryana hereby solemnly affirm, declare, and undertake.

- That all the information in the proposal is being given are correct.
- Any activity at site will be started only after grant of EC/Consent/ Statuary NOCs from the concerned departments.
- All the mining activity will be done only as per approved mining plan.

Deponent

Date & Place

Verification:

The consent of the above undertaking is true and correct to the best of my knowledge as per record & nothing has been concealed.

Deponent

Date & Place :

ADDITIONAL ANNEXURES – 4

UNDERTAKING FOR NO MINING ACTIVITY

GSTIN-06ABFFM5822N1ZY

(M) 90506-66710
(M) 92670-40000

M.M. TRADERS

Village Manglora, Near Manjeet Filling Station, Meerut Road,
KARNAL, Haryana -132001

Ref. No.....

Dated.....

UNDERTAKING

I, Mr. Vipin, Authorized Signatory of M/s M. M. Traders, having its registered office at Village Manglora Quidem, Karnal, Haryana, for the for the project - Proposed Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit) with 10,80,000 MT/ year production over an area of 33.42 ha located at Village Sultanpur, Tehsil & District Palwal and State Haryana hereby confirms that no mining activity have been done on lease area, all the mining activity will be done after obtaining environmental clearance/ consent from consent authorities.

For M/s M. M. Traders

Vipin
Date & Place

For M.M. TRADERS

Auth. Sign.

2610816/2023/Estt.Br

कार्यकारी सारांश

MINING OF SAND (MINOR MINERAL) FROM THE RIVERBED OF YAMUNA RIVER (SULTANPUR UNIT)

VILLAGE SULTANPUR & ATWA, TEHSIL & DISTRICT PALWAL AND STATE HARYANA.

MAXIMUM PRODUCTION – 10,80,000 MTPA

AREA – 33.42 HA

PROPONENT	:	**M/S M. M. TRADERS**
ENVIRONMENT CONSULTANT	:	**PARIVESH ENVIRONMENTAL ENGINEERING SERVICES** Nabet Certificate No. - NABET /EIA/2124/IA 0092 (Rev.01)
STUDY PERIOD	:	**POST-MONSOON (OCTOBER 2022 TO DECEMBER 2022)**
VERSION	:	**PEES/EIA/22-23/23**

JANUARY 2023

E. कार्यकारी सारांश

E.1. सामान्य

मैसर्स एमएम ट्रेडर्स ग्राम सुल्तानपुर, तहसील और जिला पलवल और राज्य हरियाणा में स्थित 33.42 हेक्टेयर क्षेत्र में अधिकतम 10,80,000 मीट्रिक टन / वर्ष उत्पादन के साथ यमुना नदी के किनारे से रेत (लघु खनिज) खनन का प्रस्ताव दे रहा है।

तालिका E-1: संबंधित अधिकारियों से अनुमोदन / अनुमतियां

अनापत्ति	स्वीकृति / अनुमति विवरण
पट्टा अनुदान	खदान का अनुमोदन DMG/HY/Sultanpur Unit/Palwal/2022/5242 Panchkula दिनांक 17-08-2022 द्वारा 33.42 हेक्टेयर क्षेत्र में सुल्तानपुर और अटवा गाँव में 8 वर्ष की अवधि के लिए दिया गया है।
क्लस्टर एनओसी	खान एवं भूतत्व विभाग फरीदाबाद से लीज के 500 मीटर के दायरे में आने वाली अन्य खदानों के बारे में जानकारी मांगी गई। विभाग पत्र संख्या एमओ/एफबीडी/6926 दिनांक 29.08.2022 के माध्यम से स्पष्टीकरण करता है कि खनन क्लस्टर बनाने के लिए परियोजना पट्टा सीमा से 500 मीटर के भीतर कोई अन्य खनन गतिविधि नहीं है। यह क्षेत्र में व्यक्तिगत परियोजना है।
खनन योजना	माइनिंग प्लान पत्र संख्या डीएमजी/एचजी/सुल्तानपुर यूनिट/2022/6375-6378 दिनांक 18.10.2022 के द्वारा अनुमोदित है।
वन एनओसी	संदर्भ संख्या (SRN): QC6-9N2-V919 दिनांक 28.09.2022 सुल्तानपुर इकाई और संदर्भ संख्या (SRN): XU8-D8R-RJVJ दिनांक 28.09. 2022 अटवा इकाई के द्वारा कन्फर्म हो गया की खदान क्षेत्र में कोई वन भूमि नहीं है।

तालिका E-2: मेरी मुख्य विशेषताएं

क्र.सं.	मापदंडों	विवरण
1.	परियोजना का नाम	यमुना नदी (सुल्तानपुर इकाई) के किनारे से रेत (लघु खनिज) का खनन
2.	खदान की प्रकृति और श्रेणी	गतिविधि 1(बी) की गैर-कोयला खनन श्रेणी 'बी'
3.	परियोजना प्रस्तावक	मेसर्स एमएम ट्रेडर्स
4.	खसरा नं.	**खनन के लिए (सुल्तानपुर इकाई)** 122/9// 9 min, 122/3// 3 min, 4, 5, 6, 7, 8 min, 14 min, 15, 16 min, 122/4// 10, 11, 12, 13, 16, 17, 18, 19, 20 min, 21, 22 min, 23 min, 24, 25, 122/ 5// 2, 3 min, 4, 5, 6, 7 min, 8, 14 min, 15 min, 122 min. सहायक क्षेत्र (सुल्तानपुर इकाई) के लिए

क्र.सं.	मापदंडों	विवरण		
		122/3// 11, 12, 19, 20, 21, 22, 122/6// 1, 2, 122//2 15, 16/1, 16/2, 25. **खनन के लिए (अटवा इकाई)** 9// 10 min, 11 min, 12 min, 13 min, 16 min, 17 min, 18, 19, 20, 21 min, 22 min, 23, 24, 25 8// 21 min, 22 min, 24 min, 25 min 15//, 2 min, 3 min, 4 min, 5, 6 min, 16//, 1, 2 min, 9 min, 10 10//, 4 min, 6 min, 7 min, 14 min, 15, 16 min, 17 min, 25/2 min. सहायक क्षेत्र (अटवा इकाई) के लिए 14// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.		
5.	कुल पट्टा क्षेत्र	33.42 हेक्टेयर (यमुना नदी का तल)		
6.	परियोजना का स्थान	गांव- सुल्तानपुर और अटवा, तालुक- सुल्तानपुर, जिला- पलवल, हरियाणा		
7.	टोपोशीट संख्या	H43X8 - प्रोजेक्ट साइट और H43X8, H43X12, G43F5 और G43F9 - अध्ययन क्षेत्र।		
8.	अधिकतम उत्पादन क्षमता	10,80,000 मीट्रिक टन / वर्ष		
9.	भूवैज्ञानिक खनिज रिजर्व	13,53,456 मीट्रिक टन		
10.	खनन योग्य रिजर्व	10,81,296 मीट्रिक टन		
11.	भौगोलिक समन्वय	**बिंदु**	**देशान्तर**	**अक्षांश**
		सुल्तानपुर यूनिट		
		जी	28°03'56.67"एन	77°29'6.04"ई
		एच	28°03'52.15"एन	77°29'15.54"ई
		मैं	28°03'48.25"एन	77°29'10.35"ई
		जे	28°03'51.96"एन	77°29'3.58"ई
		क्यू	28°03'44.13"एन	77°29'31.61"ई
		आर	28°03'36.68"एन	77°29'27.15"ई
		एस	28°03'50.19"एन	77°29'13.46"ई
		एटीडब्ल्यूए यूनिट		
		क्यू	28°01'58.42"एन	77°30'17.83"ई
		क्यू 1	28°01'54.90"एन	77°30'16.70"ई
		आर	28°01'56.46"एन	77°30'24.26"ई
		आर 1	28°01'52.50"एन	77°30'23.70"ई
		एस	28°01'54.77"एन	77°30'30.78"ई
		एस 1	28°01'51.20"एन	77°30'28.90"ई

<table>
<tr><th>क्र.सं.</th><th>मापदंडों</th><th colspan="3">विवरण</th></tr>
<tr><td></td><td></td><td>टी</td><td>28°01'52.97"एन</td><td>77°30'36.54"ई</td></tr>
<tr><td></td><td></td><td>टी 1</td><td>28°01'49.00"एन</td><td>77°30'36.20"ई</td></tr>
<tr><td></td><td></td><td>यू</td><td>28°01'52.09"एन</td><td>77°30'41.27"ई</td></tr>
<tr><td></td><td></td><td>यू 1</td><td>28°01'48.30"एन</td><td>77°30'41.60"ई</td></tr>
<tr><td>12.</td><td>एमएल क्षेत्र की स्थलाकृति</td><td colspan="3">उत्तरी छोर पर रिवरबेड में उच्चतम ऊंचाई 181.30mRL है और बैंक टॉप लेवल 184.0 mRL है जबकि रिवरबेड में दक्षिण छोर पर स्तर 176.00mRL है और रिवरबैंक टॉप 179.00 mRL है।
सुल्तानपुर राजस्व गांव में यमुना नदी उत्तर पश्चिम से दक्षिण पूर्व दिशा की ओर बहती है जबकि अटवा क्षेत्र नदी तल में प्रवाह की दिशा लगभग पश्चिम से पूर्व की ओर है।</td></tr>
<tr><td>13.</td><td>खनन विधि और प्रौद्योगिकी</td><td colspan="3">ओपनकास्ट मैनुअल पद्धति अपनाई जाएगी। अन्वेषण के किसी विशिष्ट तरीके की आवश्यकता नहीं है क्योंकि नदी से उत्पन्न रेत नदी के तल के साथ-साथ जमा होते हैं और सतह पर बहुत अच्छी तरह से उजागर होते हैं। इसके अलावा, ये रेत हर साल बारिश के मौसम में बाढ़ के पानी से लगभग उसी स्तर तक जमा/पुनर्भित हो जाता हैं, जो नदी के ऊपर की तरफ बारिश की तीव्रता पर निर्भर करता है। उपभोक्ता मांग को पूरा करने के लिए पर्याप्त मात्रा में बालू का भंडार उपलब्ध है।</td></tr>
<tr><td>14.</td><td>खनन की अंतिम गहराई</td><td colspan="3">यमुना नदी के तल से 3 मी</td></tr>
<tr><td>15.</td><td>भूजल स्तर</td><td colspan="3">सतह स्तर से 05 - 10 मी</td></tr>
<tr><td>16.</td><td>जीडब्ल्यूटी चौराहा</td><td colspan="3">खनन केवल सतह से 3 मीटर तक किया जाएगा। इसलिए, भूजल तालिका को प्रतिच्छेद नहीं किया जाएगा।</td></tr>
<tr><td>17.</td><td>जल निकासी पैटर्न / जल पाठ्यक्रम</td><td colspan="3">सूखी नदी की तलहटी में किया जाएगा खनन; धारा को छुआ नहीं जाएगा और केवल गैर-मानसून अवधि के दौरान ही किया जाएगा।</td></tr>
<tr><td>18.</td><td>पानी की आवश्यकता और स्रोत</td><td colspan="3">पानी का स्रोत निजी पानी के टैंकर हैं। पानी की आवश्यकता का ब्रेक-अप इस प्रकार है:
<table>
<tr><th>क्र.सं.</th><th>विवरण</th><th>मांग</th></tr>
<tr><td>1</td><td>धूल दमन</td><td>29.3 केएलडी</td></tr>
<tr><td>2</td><td>ग्रीनबेल्ट विकास</td><td>7.9 केएलडी</td></tr>
<tr><td>3</td><td>घरेलू आवश्यकता</td><td>3.0 केएलडी</td></tr>
<tr><td colspan="2">संपूर्ण</td><td>40.2 केएलडी</td></tr>
</table></td></tr>
<tr><td>19.</td><td>परियोजना की लागत</td><td colspan="3">परियोजना की पूंजीगत लागत रु. 10.18 करोड़ और मशीनरी को अनुबंध के आधार पर किराए पर लिया जाएगा।</td></tr>
</table>

स्रोतः स्वीकृत खनन योजना

E.2. वैकल्पिक का विश्लेषण

मामला ताजा खदान के पट्टे का है। खनिज स्थल विशिष्ट है, इसलिए किसी वैकल्पिक स्थल की पहचान नहीं की गई। संबंधित प्राधिकारी से पट्टा अनुमोदन प्राप्त कर लिया गया है और रिपोर्ट में संलग्न है।

E.3. आधारभूत पर्यावरण का विवरण

ईआईए अध्ययनों की तैयारी के लिए दिशानिर्देशों के अनुसार मानसून के बाद के मौसम यानी अक्टूबर 2022 से दिसंबर 2022 के दौरान पर्यावरणीय डेटा एकत्र किया गया है।

तालिका E-3: आधारभूत स्थिति

मापदंडों	आधारभूत स्थिति
परिवेशी वायु गुणवत्ता	पीएम 10 पार्टिकुलेट मैटर 10 38 $\mu g/m^3$ से 80 $\mu g/m^3$ तक भिन्न होता है। PM2.5 15 $\mu g/m^3$ से 31 $\mu g/m^3$ पाया गया। SO2 6.2 $\mu g/m^3$ से 10.6 $\mu g/m^3$ तक भिन्न था। अध्ययन क्षेत्र में NOx 10.1 $\mu g/m^3$ से 15.2 $\mu g/m^3$ पाया गया। अध्ययन क्षेत्र में CO 0.46 mg/m^3 से 1.12 mg/m^3 तक पाया गया।
शोर स्तर	सभी स्थानों पर दिन के समय रिकॉर्ड किया गया ध्वनि दबाव स्तर 37.9 dB(A) से 55.6 dB(A) तक होता है और समय में यह 27.4 dB(A) से 40.2 dB(A) के बीच होता है।
भूजल	pH (7.1 से 7.8), TDS (814 mg/l से 851 mg/l), क्षारीयता (218.5 mg/l से 274.9 mg/l), कुल कठोरता (301.2 mg/l से 313.6 mg/l), Ca के रूप में कैल्शियम (62.3 mg/l से 72.4 mg/l), मैग्नीशियम के रूप में Mg (31.6 mg/l से 36.1 mg/l), क्लोराइड (215.0 mg/l से 261.4 mg/l) और सल्फेट (52.4 mg/l से 59.2 mg/l) एल) मापदंडों का विश्लेषण किया गया।
सतही जल	पीएच 7.2 से 7.6 के बीच भिन्न था। स्रोतों की घुलित ऑक्सीजन 5.8 से 6.4 के बीच भिन्न थी। बीओडी 39 mg/l से 46 mg/l देखा गया। कुल कॉलीफॉर्म 1400 से 1600 एमपीएन/100 मिली के बीच पाया गया।
मिट्टी की गुणवत्ता	अध्ययन क्षेत्र में मिट्टी मुख्यतः दोमट है। पीएच 7.2 से 8.0 के बीच था। चालकता 319 µmhos/cm से 418 µmhos/cm तक भिन्न थी। कार्बनिक कार्बन 0.3% से 0.51% तक भिन्न था। नाइट्रोजन की मात्रा 138 किग्रा/हेक्टेयर से 193 किग्रा/हेक्टेयर थी। फास्फोरस की मात्रा 15 किग्रा/हेक्टेयर से 21 किग्रा/हेक्टेयर के बीच थी। पोटेशियम 109 किग्रा/हेक्टेयर से 124 किग्रा/हेक्टेयर तक भिन्न था।
अंतरिक्ष-विज्ञान	अक्टूबर के महीने में अधिकतम तापमान 35.3 डिग्री सेल्सियस और दिसंबर के महीने में न्यूनतम तापमान 8.2 डिग्री सेल्सियस रहा। रिकॉर्ड की गई औसत हवा की गति 1.3 मीटर/सेकंड थी। अध्ययन अवधि के दौरान मुख्य रूप से हवा की दिशा दक्षिण पूर्व से उत्तर पूर्व और उसके बाद उत्तर पूर्व से दक्षिण पश्चिम थी।

E.4. प्रत्याशित पर्यावरणीय प्रभाव और शमन उपाय

प्रस्तावित खनन प्रचालनों से प्रदूषकों की सघनता निर्धारित सीमा से अधिक बढ़ने का अनुमान नहीं है। पहचाने गए प्रभावों और शमन उपायों का विवरण नीचे दिया गया है।

- ✓ इस खनन गतिविधि के कारण मौजूदा यातायात में कुल 774 पीसीयू/दिन की वृद्धि होगी इसलिए वाहन चलने से अतिरिक्त ध्वनि हो सकती है और परिवहन मार्ग के पास ग्रामीणों के मानव स्वास्थ्य पर भी प्रभाव पड़ सकता है जैसे सांस और श्वसन संबंधी समस्याएं। वाहनों की तेज आवाजाही से दुर्घटना हो सकती है। ट्रक की आवाजाही केवल सुझाए गए परिवहन मार्ग से होगी। 7900 नग पौधे लगाने का प्रस्ताव है। प्रभाव को कम करने के लिए योजना अवधि में प्रस्तावित पौधरोपड़ एवं दिन में दो बार पानी का छिड़काव किया जाएगा।
- ✓ मशीनरी को अच्छी चालू स्थिति में बनाए रखा जाएगा ताकि शोर को न्यूनतम संभव स्तर तक कम किया जा सके। पीयूसी सर्टिफिकेट वाले वाहन किराए पर लिए जाएंगे। वाहनों का सुचारू संचालन सुनिश्चित करने के लिए वाहनों का नियमित रखरखाव किया जाएगा। कामगारों को स्वीकार्य शोर स्तर और उन स्तरों के अधिकतम जोखिम के प्रभाव के बारे में जागरूकता प्रदान की जाएगी। साथ ही ट्रक चालकों को हिदायत दी जाएगी कि ग्रामीण क्षेत्र व संवेदनशील जोन में हार्न का कम से कम प्रयोग करें।
- ✓ जल पर्यावरण पर कोई प्रभाव नहीं होगा क्योंकि खनन केवल 3 मीटर तक ही सीमित होगा और परियोजना स्थल का जल स्तर सतह से 5-10 मीटर है। इसलिए, पानी पर कोई प्रभाव नहीं पहचाना गया। प्रस्तावित खनन गतिविधि से केवल 0.6 केएलडी सेनेटरी अपशिष्ट जल उत्पन्न होगा जिसे सेप्टिक टैंक में उपचारित किया जाएगा और इसका उपयोग वृक्षारोपण एवं धूल के निराकरण के उद्देश्य से किया जाएगा।
- ✓ खान कर्मी प्रति दिन लगभग 16 किलोग्राम नगरपालिका ठोस अपशिष्ट उत्पन्न करेगा, जिसका मानव स्वास्थ्य पर प्रतिकूल प्रभाव पड़ेगा। घरेलू कचरा संग्रहण के लिए 4 नग कचरा उपलब्ध कराया जाएगा। रिवरबेड एरिया में माइनिंग से ओवरबर्डन नहीं होगा।
- ✓ खनन गतिविधियों को व्यवस्थित तरीके से सड़क के बुनियादी ढांचे और वाहन परिवहन को बनाए रखते हुए किया जाएगा, जो क्षेत्र में स्थलाकृति और जल निकासी के संरक्षण के लिए एक सुरक्षात्मक उपाय होगा।
- ✓ खनन या सहायक क्षेत्र में कोई मानव बंदोबस्त प्रस्तावित नहीं है। स्थानीय लोगों को काम के लिए प्राथमिकता दी जाएगी।
- ✓ जलीय जीवन पर प्रभाव को कम करने के लिए बरसात के मौसम में कोई खनन नहीं किया जाएगा।
- ✓ अध्ययन अवधि के दौरान देखी गई अनुसूची I की केवल 1 प्रजाति (मटर फाउल - पावो क्रिस्टेटस) है, जिसके लिए संरक्षण योजना को तैयार किया गया था। वन्यजीव प्रजातियों के संरक्षण के लिए अतिरिक्त 10 लाख रुपये का बजट प्रस्तावित है।
- ✓ रेत के खनन से स्थानीय लोगों की प्रति व्यक्ति आय में वृद्धि होने की संभावना है जिससे लोगों की सामाजिक आर्थिक स्थिति में सुधार होगा। स्थानीय लोगों को या तो प्रत्यक्ष रोजगार या अप्रत्यक्ष रोजगार जैसे व्यवसाय,

अनुबंध कार्य और विकास कार्य जैसे सड़कें आदि और अन्य कल्याणकारी सुविधाएं जैसे चिकित्सा सुविधाएं, वाहन, मुफ्त शिक्षा, पेयजल आपूर्ति आदि प्रदान की गई हैं।

- ✓ धूल के उत्पादन को छोड़कर, कोई ऐसा स्रोत नहीं है जो स्वास्थ्य संबंधी बीमारियों की संभावना दिखा सके। स्प्रिंकल माउंटेड टैंकरों से नियमित पानी का छिड़काव किया जाएगा और श्रमिकों को डस्ट मास्क प्रदान किए जाएंगे।
- ✓ व्यक्तिगत सुरक्षा उपकरण शोर जोखिम को रोकने के लिए प्रदान करेगा। खनन गतिविधि के दौरान व्यक्तिगत सुरक्षा उपकरण प्रदान किए जाएंगे। नियमित स्वास्थ्य जांच शिविर आयोजित किए जाएंगे। नियोक्ता द्वारा सभी श्रमिकों का बीमा किया जाएगा।

E.5. पर्यावरण निगरानी कार्यक्रम

निर्धारित मानकों के भीतर पर्यावरण की गुणवत्ता को बनाए रखने के लिए विभिन्न पर्यावरणीय घटकों की नियमित निगरानी आवश्यक है जिसका अनुपालन शर्तों के अनुसार किया जाएगा। इसके लिए पट्टेदार ने खान की पर्यावरण नीति बनाने एवं पर्यावरण प्रबंधन प्रकोष्ठ गठित करने का निर्णय लिया है तथा अनुमोदित पर्यावरण नीति में उल्लिखित उद्देश्यों से प्रस्तावित खान के संचालन के लिए प्रतिबद्ध है। हवा, पानी, शोर और मिट्टी की निगरानी के लिए परियोजना प्रस्तावक द्वारा 60.0 हजार वार्षिक व्यय किया जाना है।

E.6. अतिरिक्त अध्ययन

खनन योजना के अन्तर्गत किये गये प्रस्ताव के अनुसार क्षेत्र का विकास खुली खदान विधि से किया जायेगा। खनन प्रक्रिया के दौरान जल स्तर को छुआ नहीं जाएगा। भूस्खलन, धंसाव बाढ़ आदि जैसी कोई उच्च जोखिम वाली दुर्घटना की आशंका नहीं है।

सुरक्षा स्वास्थ्य और पर्यावरण (एसएचई) नीति मौजूद है और साइट पर सभी के लिए और अन्य हितधारकों के लिए सुलभ है। नीति को विधायी अनुपालन, हितधारकों की भागीदारी, निरंतर सुधार और उद्देश्यों द्वारा प्रबंधन को ध्यान में रखते हुए तैयार किया गया है।

स्वास्थ्य पर प्रभाव को कम करने के लिए पीपीई जैसे डस्ट मास्क, ईयर प्लग/मफ और अन्य उपकरण कार्य कर्मियों द्वारा उपयोग के लिए प्रदान किए जाएंगे। नियुक्ति के समय खान नियम 1955 के अनुसार सभी श्रमिकों की प्रारंभिक चिकित्सा जांच की जाएगी। पांच साल में कम से कम एक बार आवधिक चिकित्सा परीक्षा आयोजित की जाएगी। चिकित्सा शिविर का आयोजन छह माह में प्रस्तावक द्वारा किया जायेगा।

परियोजना क्षेत्र और आस-पास के क्षेत्र के भीतर जनसंख्या का कोई विस्थापन नहीं है। मेरा यह कार्य आसपास की कुछ आबादी को अधिक रोजगार, अवसर प्रदान करेगा, यह हमेशा स्पष्ट है कि सुरक्षित खनन गतिविधि निवासियों की सामाजिक-आर्थिक स्थिति में सुधार करने में मदद करेगी।

E.7. परियोजना लाभ

परियोजना प्रस्तावक अपनी सामाजिक जिम्मेदारी और एक अच्छे कॉर्पोरेट नागरिक के रूप में जागरूक है; यह आवश्यकता विशिष्ट (कुशल और गैर-कुशल) रोजगार करने का प्रस्ताव है। यह परियोजना स्थानीय लोगों को प्रत्यक्ष और अप्रत्यक्ष रूप से रोजगार प्रदान करेगी। अप्रत्यक्ष रोजगार में दुकानदार, मैकेनिक, चालक, ट्रांसपोर्टर आदि शामिल हैं। निकटवर्ती गांवों से लगभग 67 व्यक्तियों को प्रत्यक्ष रोजगार तथा 20 व्यक्तियों को अप्रत्यक्ष रोजगार प्राप्त होगा।

विकासकर्ता ईएसआर कार्यक्रम को भी मानदंडों के अनुसार अपनाएगा और आस-पास के गांवों को अलग-अलग सुविधाएं प्रदान करेगा। कार्यक्रम की मुख्य विशेषताएं इस प्रकार हैं:

- ✓ सामाजिक कल्याण कार्यक्रम जैसे चिकित्सा सुविधाओं, शैक्षिक सुविधाओं, कर्मचारियों के साथ-साथ आस-पास के ग्रामीणों के लिए पानी की आपूर्ति का प्रावधान किया जाएगा।
- ✓ स्थानीय लोगों को प्राथमिकता देकर स्थानीय लोगों के रोजगार की सुनियोजित योजना तैयार की गई है।
- ✓ ग्रामीण आबादी के बीच स्वास्थ्य निगरानी शिविरों, सामाजिक कल्याण और विभिन्न जागरूकता कार्यक्रमों का प्रयास किया जाएगा।
- ✓ सामाजिक वृक्षारोपण कार्यक्रम में सहायता करना।
- ✓ सामान्य विकास के लिए गांवों को गोद लेना।
- ✓ आस-पास के गांवों में पानी की आपूर्ति।
- ✓ गांवों के भीतर सड़कों आदि जैसी सुविधाओं का विकास।

E.8. पर्यावरण प्रबंधन योजना की लागत

विस्तृत गतिविधि-वार गणना की गई है जो क्रमशः पूंजीगत लागत के रूप में 26.0 लाख रुपये और आवर्ती लागत के रूप में 6.90 लाख रुपये प्रति वर्ष है। डेवलपर द्वारा पर्यावरण सुरक्षा के लिए INR 60.5 लाख का कुल बजट सुनिश्चित किया गया है।

E.9. निष्कर्ष

उपरोक्त चर्चा के अनुसार खनिज की लोडिंग, अनलोडिंग और परिवहन के दौरान अस्थायी उत्सर्जन को छोड़कर खनन के कारण पर्यावरण पर कोई बड़ा प्रभाव नहीं पड़ता है। अनुमेय सीमा के भीतर विभिन्न प्रदूषकों को शामिल करने के लिए पर्याप्त निवारक उपाय अपनाए जाएंगे। लगभग 7,900 पौधे रोपने और रख-रखाव और बाड़ लगाने सहित 1000 रुपये /पौधे को ध्यान में रखते हुए वृक्षारोपण प्रस्तावित है। यह एक प्रभावी प्रदूषण शमन तकनीक साबित होगी और मानसून के मौसम में मिट्टी के कटाव से बचने में मदद करेगी। स्थानीय लोगों को रोजगार के अवसर केवल खदान स्थल से खनिजों का निष्कर्षण प्रदान करना ही उनके लिए अपनी आजीविका के लिए प्रचलित व्यवसाय है। सरकारी इमारतों, स्कूलों के आस-पास, पहुंच सड़कों के साथ-साथ खदान परिसर में वृक्षारोपण किया जाएगा।

2610816/2023/Estt.Br

EXECUTIVE SUMMARY

MINING OF SAND (MINOR MINERAL) FROM THE RIVERBED OF YAMUNA RIVER (SULTANPUR UNIT)

VILLAGE SULTANPUR & ATWA, TEHSIL & DISTRICT PALWAL AND STATE HARYANA.

MAXIMUM PRODUCTION – 10,80,000 MTPA

AREA – 33.42 HA

PROPONENT	:	**M/S M. M. TRADERS**
ENVIRONMENT CONSULTANT	:	**PARIVESH ENVIRONMENTAL ENGINEERING SERVICES** Nabet Certificate No. - NABET /EIA/2124/IA 0092 (Rev.01)
STUDY PERIOD	:	**POST-MONSOON (OCTOBER 2022 TO DECEMBER 2022)**
VERSION	:	**PEES/EIA/22-23/23**

JANUARY 2023

E. Executive Summary

E.1. General

M/s M. M. Traders is proposing the sand mine project on riverbed of Yamuna River. Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River with 10,80,000 MT/ year production over an area of 33.42 ha located at Village Sultanpur, Tehsil & District Palwal and State Haryana.

Table E–1: Approvals / Permissions from Concerned Authorities

NOCs	Approval / Permission Details
Lease Grant	Letter of Intent has been issued by the Director Mines & Geology Haryana vide letter no. **DMG/HY/SULTANPUR UNIT/PALWAL/2022/5242 PANCHKULA dated 17-08-2022** for Mining of Sand (Minor Mineral) in Sultanpur Unit, comprising Sultanpur & Atwa villages over an area of 33.42 hectares in district Palwal, Haryana for a period of 8 years.
Cluster NOC	The information was asked about other mines coming within 500m radius from the lease from Department of Mines and Geology, Faridabad. The clarification from department vide letter **MO/FBD/6926 dated 29.08.2022** confirms there is no other mining activity within 500m from project lease boundary to form mining cluster. So, it is individual project in the area.
Mining Plan	As per rule 70 of Haryana Minor Mineral Concession, Stocking, Transportation of Minerals & Presentation of Illegal Mining Rule, 2012, the mining plan was submitted to department and mining plan was approved vide reference no. **DMG/HG/SULTANPUR UNIT/2022/6375-6378 DATED 18.10.2022**.
Forest NOC	Clarification for No forest involved in proposed lease for both pits have been obtained vide **Reference No. (SRN): QC6-9N2-V919 dated 28.09.2022** for Sultanpur unit & **Reference No. (SRN): XU8-D8R-RJVJ dated 28.09.2022** for Atwa unit.

Table E–2: Salient Features of Mine

S. No.	Parameters	Description
1.	Name of the project	Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Sultanpur Unit)
2.	Nature & category of Mine	Non-Coal Mining Category 'B' of Activity 1(B)
3.	Project Proponent	M/s M. M. Traders
4.	Khasra No.	**For Mining (Sultanpur Unit)** 122/9// 9 min, 122/3// 3 min, 4, 5, 6, 7, 8 min, 14 min, 15, 16 min, 122/4// 10, 11, 12, 13, 16, 17, 18, 19, 20 min, 21, 22 min, 23 min, 24, 25, 122/ 5// 2, 3 min, 4, 5, 6, 7 min, 8, 14 min, 15 min, 122 min. For Ancillary area (Sultanpur Unit) 122/3// 11, 12, 19, 20, 21, 22, 122/6// 1, 2, 122//2 15, 16/1, 16/2, 25. **For Mining (Atwa Unit)** 9// 10 min, 11 min, 12 min, 13 min, 16 min, 17 min, 18, 19, 20, 21 min, 22 min, 23, 24, 25 8// 21 min, 22 min, 24 min, 25 min 15//, 2 min, 3 min, 4 min,

S. No.	Parameters	Description		
		5, 6 min, 16//, 1, 2 min, 9 min, 10 10//, 4 min, 6 min, 7 min, 14 min, 15, 16 min, 17 min, 25/2 min. For Ancillary area (Atwa Unit) 14// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.		
5.	Total Lease area	33.42 Ha (Riverbed of Yamuna River)		
6.	Location of the project	Village- Sultanpur & Atwa, Taluk- Sultanpur, District- Palwal, Haryana		
7.	Toposheet No.	H43X8 - Project Site & H43X8, H43X12, G43F5 & G43F9 - Study Area.		
8.	Maximum Production Capacity	10,80,000 Metric Tonne / Year		
9.	Geological Mineral Reserve	13,53,456 Metric Tonne		
10.	Mineable Reserve	10,81,296 Metric Tonne		
11.	Geographical co-ordinates	**Point**	**Longitude**	**Latitude**
		SULTANPUR UNIT		
		G	28°03'56.67"N	77°29'6.04"E
		H	28°03'52.15"N	77°29'15.54"E
		I	28°03'48.25"N	77°29'10.35"E
		J	28°03'51.96"N	77°29'3.58"E
		Q	28°03'44.13"N	77°29'31.61"E
		R	28°03'36.68"N	77°29'27.15"E
		S	28°03'50.19"N	77°29'13.46"E
		ATWA UNIT		
		Q	28°01'58.42"N	77°30'17.83"E
		Q1	28°01'54.90"N	77°30'16.70"E
		R	28°01'56.46"N	77°30'24.26"E
		R1	28°01'52.50"N	77°30'23.70"E
		S	28°01'54.77"N	77°30'30.78"E
		S1	28°01'51.20"N	77°30'28.90"E
		T	28°01'52.97"N	77°30'36.54"E
		T1	28°01'49.00"N	77°30'36.20"E
		U	28°01'52.09"N	77°30'41.27"E
		U1	28°01'48.30"N	77°30'41.60"E
12.	Topography of ML area	Highest elevation in riverbed at extreme north end is 181.30mRL and bank top level is 184.0 mRL whereas the levels at the extreme south end in riverbed is 176.00mRL and Riverbank top is 179.00 mRL. The Yamuna River flows from NW to SE direction in Sultanpur revenue village whereas its direction of flow in Atwa area riverbed is almost west to east.		
13.	Mining Method & Technology	Opencast manual method will be adopted. No specific method of exploration is required as the river borne sediments are deposited all along the riverbed and are very well exposed on the surface. Moreover, these sediments are accumulated/ replenished every year during rainy season by flood waters to almost the same level depending on the intensity of rains on the upstream side. Adequate quantity of sand reserves is available for meeting consumer demand.		
14.	Ultimate depth of Mining	3 m from the riverbed of Yamuna River		

S. No.	Parameters	Description
15.	Ground water level	05 - 10 m from the surface level
16.	GWT intersection	Mining will be done only up to 3m from surface. So, ground water table will not be intersected.
17.	Drainage pattern/ water courses	Mining will be done in dry riverbed; stream will not be touched and will be done only during non-monsoon period.
18.	Water requirement & source	The source of water is private water tankers. The break-up of water requirement is as follows:

S. No.	Description	Demand
1	Dust Suppression	29.3 KLD
2	Greenbelt Development	7.9 KLD
3	Domestic Requirement	3.0 KLD
	Total	**40.2 KLD**

19.	Cost of project	The capital cost for the project will be Rs. 10.18 Crores and machinery will be hired on contract bases.

Source: Approved Mining Plan

E.2. Analysis of Alternative

It is case of fresh quarry lease. The mineral is site specific, so no alternative site was identified. Lease approval from concerned authority has been obtained and enclosed in report.

E.3. Description of Baseline Environment

Environmental data has been collected during post-monsoon season i.e., October 2022 to December 2022 in accordance with the guidelines for preparation of EIA studies.

Table E–3: Baseline Status

Parameters	Baseline Status
Ambient Air Quality	PM_{10} particulate matter 10 varying from 38 µg/m^3 to 80 µg/m^3. $PM_{2.5}$ was observed 15 µg/m^3 to 31 µg/m^3. SO_2 was varying from 6.2 µg/m^3 to 10.6 µg/m^3. NOx was observed 10.1 µg/m^3 to 15.2 µg/m^3 in study area. CO was observed from 0.46 mg/m^3 to 1.12 mg/m^3 in study area.
Noise Level	The Sound Pressure Level recorded during the daytime on all locations varies from 37.9 dB(A) to 55.6 dB(A) & in time it varies between 27.4 dB(A) to 40.2 dB(A).
Ground Water	All the parameters were observed mostly exceeding the acceptable limits but well within permissible limits for drinking water standard 10500:2012. pH (7.1 to 7.8), TDS (814 mg/l to 851 mg/l), alkalinity (218.5 mg/l to 274.9 mg/l), Total Hardness (301.2 mg/l to 313.6 mg/l), Calcium as Ca (62.3 mg/l to 72.4 mg/l), Magnesium as Mg (31.6 mg/l to 36.1 mg/l), Chloride (215.0 mg/l to 261.4 mg/l) & Sulphate (52.4 mg/l to 59.2 mg/l) parameters were analysed.
Surface Water	The pH was varying between 7.2 to 7.6. Dissolved Oxygen of the sources was varying between 5.8 to 6.4. BOD was observed 39 mg/l to 46 mg/l. Total Coliform were observed varying between 1400 to 1600 MPN/100ml.
Soil Quality	The soil was predominantly Loamy in the study area. The pH was ranges 7.2 to 8.0. The conductivity was varying from 319 µmhos/cm to 418 µmhos/cm. Organic Carbon was varying from 0.3% to 0.51%. Nitrogen was varying from

Parameters	Baseline Status
	138 kg/ha to 193 kg/ha. Phosphorous was varying from 15 kg/ha to 21 kg/ha. Potassium was varying from 109 kg/ha to 124 kg/ha.
Meteorology	The maximum temperature was 35.3°C in the month of October and the minimum temperature was 8.2°C in the month of December. The average wind speed recorded was 1.3 m/sec. Predominant wind direction during the study period was mainly SW to NE followed by NE to SW.

E.4. Anticipated Environmental Impact and Mitigation Measures

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. The identified impacts and mitigation measures are detailed below.

- ✓ Total 774 PCU/ day will increase in the existing traffic due to this mining activity hence vehicle collation may occur unwanted sound and can also cause impact on human health of villagers near to transportation route like effect on breathing and respiratory issues. Accidents may occur due to fast movement of vehicles. The truck movement will be from suggested transportation route only. It is proposed to plant 7900 nos. of plants in plan period and water sprinkling will be done twice in a day to reduce the impact.
- ✓ The machinery will be maintained in good running condition so that noise will be reduced to minimum possible level. Vehicles with PUC certificate will be hired. Regular maintenance of vehicles will be done to ensure smooth running of vehicle. Awareness will be imparted to the workers about the permissible noise level and effect of maximum exposure to those levels. In addition, truck drivers will be instructed to make minimum use of horns in the village area and sensitive zones.
- ✓ There will be no impact on water environment as the mining will be limited to 3m only and the water level of project site is 5-10m from the surface. So, no impact on water was identified. Only 0.6 KLD sanitary wastewater will be generated from the proposed mining activity which will be treated in septic tanks and will be used for plantation purpose.
- ✓ The mine worker will generate municipal solid waste of about 16 Kg per day, which will have an adverse impact on human health. There will be 4 Nos. of garbage, provided for domestic waste collection. There will be no overburden due to mining in the riverbed area.
- ✓ The mining activities will be done in a systematic manner by maintaining the road infrastructure and vehicle transport, which will be a protective measure for preserving the topography and drainage in the area.
- ✓ No human settlement is proposed in mining or ancillary area. Local manpower will be preferred.
- ✓ No mining will be carried out during the rainy season to minimize impact on aquatic life.
- ✓ There is only 1 species (**Pea fowl -** *Pavo cristatus*) of Schedule I observed during the study period hence, for the same conservation plan was prepared. Subsequently, a budget of Rs. 10 Lakhs has allotted for the conservation of wildlife species.
- ✓ The mining of Sand is likely to increase the per capita income of local people by which the socioeconomic status of the people will be improved. The local people have been provided with either direct employments or indirect employment such as business, contract works

and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc.

- ✓ Except dust generation, there is no source which can show a probability for health-related diseases. Regular water sprinkling will be done with sprinkles mounted tankers and dust masks will be provided to the workers.
- ✓ Personal protective equipment will provide to prevent the noise exposure. Personal Protective Equipment will be provided during mining activity. Regular Health check-up camps will be organized. All the workers will be insured by employer.

E.5. Environmental Monitoring Program

To maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will have complied as per conditions. For this the lessee has taken decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. A budget for monitoring of Air, water, Noise and Soil will be Rs. 60.0 thousand annual which is to be incurred by the project proponent for undertaking pollution prevention measures during the mining activity.

E.6. Additional Studies

As per proposal made under the mining plan the area will be developed by means of opencast mining method. Water table will not be touched during the mining process. No high-risk accidents like landslides, subsidence flood etc. have been apprehended.

The Safety Health and Environmental (SHE) policy is existing and accessible to all at site and to other stakeholders. The policy has been framed considering legislative compliance, stakeholder involvement, continual improvement, and management by objectives.

To minimize the health impacts PPE like dust masks, ear plugs/ muffs and other equipment will be provided for use by the work personnel. All workers will be subjected to Initial Medical Examination as per Mines Rule 1955 at the time of appointment. Periodical Medical Examination will be conducted at least once in five years. Medical camps will be organized Six Monthly by proponent.

There is no displacement of the population within the project area and adjacent nearby area. This working of mine will offer more employment, chances to some of the nearby population, it is always obvious that the safe mining activity will help to improve socio-economic conditions of the inhabitants.

E.7. Project Benefit

The project proponent is conscious of its social responsibility and as any good corporate citizen; it is proposed to undertake the need specific (skilled & non-skilled) employment. This Project will provide employment to local people directly and indirectly. Indirect employers are shopkeepers, mechanic, drivers, transporters etc. About 67 persons will get direct employment and 20 persons will get indirect employment form nearby villages. The workers will be mostly skilled.

The developer will also adopt the ESR program as per norms and will provide vary facilities the nearby villages. The salient features of the programme are as follows:

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

E.8. Cost of Environment Management Plan

The detailed activity-wise has been calculated which are INR 26.0 Lakhs as a Capital Cost and INR 6.90 Lakhs per annum as a Recurring cost, respectively. Total budget of INR 60.5 Lakh for environmental measurements has been ensured by the developer.

E.9. Conclusion

As per above discussion there is no major impact on the environment due to mining except fugitive emission during loading, unloading of mineral & transportation. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. It is proposed to plant about 7,900 saplings and gap plantation considering 1000 / plant including maintenance and fencing. It will prove an effective pollution mitigate technique and help avoid soil erosion during monsoon season. Employment opportunities will be provided to the locals only as providing extraction of minerals from the mine site is the only prevailing occupation for them for their livelihood. Plantation development will be carried out in the mine premises, along the approach roads, around Govt. buildings, schools approx.