
HARYANA STATE POLLUTION CONTROL BOARD
C-11, Sector-6, Panchkula
Ph – 0172- 577870-73, Fax No. 2581201
E-mail- hspcbplanning@gmail.com
Website: hspcb.org.in

Date: 04-03-2025

To

The Member Secretary,
State Environment Impact Assessment Authority (SEIAA)
Bays No. 55 - 58, Paryatan Bhawan,
1st floor, Sector 2, Panchkula.

Sub: Proceedings of the Public Hearing for Proposed Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut South Unit), with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in Chandhut South Village, Palwal Tehsil & District of Haryana State- Regarding Submission of Draft EIA (Environment Impact Assessment) Report for Conducting Public Hearing as per provision of EIA notification 2006.(M/s Apex Project Works).

Kindly refer to reference dated 12.06.2024 on the subject noted above.

Please find enclosed herewith the proceeding of the public hearing conducted on 24.10.2024 at 11:00 AM under the provisions of EIA Notification dated 14.09.2006 for proposed project Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut South Unit), with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in Chandhut South Village, Tehsil & District- Palwal of Haryana State forwarded by Regional Officer, Palwal Region, Haryana State Pollution Control Board vide letter dated 13.01.2025 alongwith attendance sheet, CD, photographs and other relevant documents for information and further necessary action.

DA/as above.

Digitally signed by
VIKAS CHAND

Date: 04-03-2025
12:35:39
Environmental Engineer (HQ)
For Member Secretary

Endst. No.

Date:

A copy of above alongwith copy of proceeding with attendance sheet is forwarded to following for information and further necessary action please:-

1. The Secretary, Impact Assessment division –II (I), Minister of Environment Forest and Climate Change ,India Paryavaran, Bhavan, Vayu Wing, 3rd floor, Aliganj Jor Bagh Road, New Delhi 110003
2. The Additional Chief Secretary to Govt. Haryana, Environment Forest and Wild Life Department.
3. The Director, Environment and Climate Change Department, Haryana.
4. The Deputy Commissioner, Palwal.

5. The Chairman, Zila Parishad, Palwal.
6. DMC/E.O., Municipal Council, Palwal.
7. District Development and Panchayat Officer, Palwal.
8. Deputy Director District Industries Centre, Palwal.
9. Regional Officer, Palwal Region. He is requested to send the copy of proceedings to all the concerned Village Panchayat for displaying in the same their offices.
10. PS to Chairman.
11. PA to Member Secretary.
12. Nodal Officer-IT for uploading the proceeding on the website of the Board.
13. M/s APEX PROJECT WORKS Shop No. 1, Manjeet Filling Station, Near Yamuna Pur, Manglora, KARNAL, HARYANA, ,132001.

DA/Copy of Proceeding

**Environmental Engineer (HQ)
For Member Secretary**



Regional Office, Palwal Region
 Haryana State Pollution Control Board
 II- Floor, HSVP Office Complex, Near
 Gymkhana Club, Sector-12, Palwal
 Website - www.hspcb.gov.in E-Mail - hspcb@hspcb.gov.in

No. HSPCB/PAL/2024/1622

Dated: 13/01/2025

To

The Chairman,
 Haryana State Pollution Control Board,
 Panchkula, Haryana

Kind Attention: Sr. Environment Engineer- Coordination Cell (HQ)

Sub: Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut South Unit) with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in Chandhut South Village, Palwal Tehsil & District of Haryana State- Regarding Submission of Draft EIA (Environment Impact Assessment) Report for Conducting Public Hearing as per provision of EIA notification 2006 (amended thereof).

Kindly refer to the subject noted above.

In this regard, please find enclosed herewith the duly signed Proceedings of the Public Hearing for Proposed Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut South Unit) with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in Chandhut South Village, Palwal Tehsil & District of Haryana State- Regarding Submission of Draft EIA (Environment Impact Assessment) Report for Conducting Public Hearing as per provision of EIA notification 2006 (amended thereof), under chairmanship of Smt. Jyoti, IAS, Sub-Divisional Magistrate (SDM), Palwal and under the supervision of Deputy Commissioner, Palwal. The original proceedings with two photo copies, two sets video recording (Pen drive), two sets of Photo albums, copies of attendance register and Annexure's are also attached for further submission to Competent Authority for approval.

Submitted for kind information, and further necessary action, please.

DA: As Above


 Regional Officer
 Palwal Region

Proceedings of the Public Hearing for Proposed Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut South Unit) with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in Chandhut South Village, Palwal Tehsil & District of Haryana State- Regarding Submission of Draft EIA (Environment Impact Assessment) Report for Conducting Public Hearing as per provision of EIA notification 2006 (amended thereof)..

Please find enclosed herewith the Proceedings of the Public Hearing for Proposed Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut South Unit) with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in Chandhut South Village, Palwal Tehsil & District of Haryana State- Regarding Submission of Draft EIA (Environment Impact Assessment) Report for Conducting Public Hearing as per provision of EIA notification 2006 (amended thereof) for kind approval please.


Regional Officer, HSPCB


Sub-Divisional Magistrate (SDM), Palwal

11
Deputy Commissioner
PALWAL.

MINUTES OF MEETING OF PUBLIC HEARING

PROJECT	MINING OF SAND (MINOR MINERAL)
PROJECT PROPONENT	M/S APEX PROJECT WORKS
CATEGORY UNDER EIA NOTIFICATION	NON-COAL MINING CATEGORY 'B' OF ACTIVITY 1(B)
MEETING VENUE	VILLAGE - CHANDHUT, TEHSIL & DISTRICT - PALWAL, STATE - HARYANA
MEETING DATE & TIME	24 TH OCTOBER 2024, 11:00 MORNING
MEETING TYPE	OFFLINE

Minutes of Public Hearing under the provisions of EIA Notification, 2006 conducted for the proposed Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South Unit) at Village: Chandhut South, Tehsil & District: Palwal and State: Haryana (Mining lease area: 98.156 ha), with Production capacity of 43.35,000 MTPA by M/s. Apex Project Works.

The following Government Officers took part and conducted the Environmental Public Hearing:

1. Ms. Jyoti, SDM, Palwal
2. Ms. Akansha Tanwar, Regional Officer, HSPCB, Palwal.
3. Ms. Nirmla, Mining Officer, Palwal

The following representatives of M/s. Apex Project Works were present:

1. Mr. Vipin Sharma

The following representative of EIA Consultants, Parivesh Environment Engineering Services (QCI-NABET Approved EIA Consultant)

1. Mr. Amit Kumar

Mr. Amit Kumar, representative of EIA Consultant, conveyed his invitation to the SDM, Palwal and Regional Officer, Palwal, HSPCB for their presence at the Public Hearing. He presented the Project Synopsis and EIA study with a PowerPoint Presentation to the public present in the occasion. He briefed about the salient features of the project, the baseline observations, impacts and mitigation measures undertaken and proposed by the project proponent. The essence of the presentation are:

1. Letter of Intent (LOI) has been issued by the Director, Mines & Geology Haryana vide letter no. DMG/HY/Chandhut (South) Unit/Palwal/2023/5727 dated 08.10.2023 for Mining of Sand (Minor Mineral) in Chandhut (South) Unit, comprising Chandhut (South) village over an area of 98.156 ha (245.39 acres) in district Palwal, Haryana for a period of 10 years.

2. The proposed project involves mining of minor mineral i.e. sand from the bed of Yamuna, at Village- Chandhut, Tehsil & District- Palwal, Haryana from an aqueducted area of 98,156 ha.
3. The capital cost for the project will be Rs. 17 Crores including proposed lease area and machinery will be hired on contract bases.
4. The applicant, applied for environment clearance to Haryana State Environmental Impact Assessment Authority (Haryana SEIAA) on date 23.05.2024 (online) vide proposal no. SIA/HR/MIN/473999/2024 to obtain "Terms of Reference" (ToR). The standard ToR was issued by State Level Environment Impact Assessment Authority, Haryana vide TOR Identification No. TO24B0107HR5295893N dated 12.06.2024. The proponent also asked to conduct the public hearing on this project. Accordingly, the public hearing is being carried out today at this place.
5. It was presented that the mine location does not fall under any sensitive zone.
6. The mining proposed by an opencast mechanized method without drilling and blasting.
7. Highest elevation in riverbed at extreme north end is 127.25 mRL and bank top level is 130.0 mRL whereas the levels at the extreme south end in riverbed is 124.78 mRL and Riverbank top is 128.17 mRL. The Yamuna River flows from N to S direction in Chandhut revenue village. Mining activities will start in the blocks from the upstream side to downstream side. Mining will be done only up to maximum depth of 3.0 mbgl.
8. The minor mineral i.e. sand is proposed to be excavated by Light weight excavators and will also be used for loading of mineral in tippers.
9. The loading of the mineral shall be mechanical while transport of mineral from riverbed shall be done by private trucks/tippers/operators (which should be covered by tarpal).
10. Total lease area is replenishable yearly.
11. Mineral extraction will be done for a period of about 268 days in a year.
12. The total water requirement is 37.70 KLD as estimated, 16.10 KLD for Dust Suppression, 13.70 KLD for Greenbelt / Plantation & 7.90 KLD for Domestic Requirement. Water will be supplied by private water tanker.
13. It is proposed to plant 13,710 nos. of plantation on riverbank bands, ancillary area & connected haul road with consultation of local administration and Forest department.
14. Adequate measures will be adopted to minimize the impact of pollutants generated from mining activities.
15. Water sprinkling and plantation on haul roads shall be done for controlling Air Pollution.

16. An amount of Rs. 34.00 lakhs shall be incurred for improvement of biological environment of area which will include survey for presence of Schedule Wildlife as per Indian Wildlife (Protection) Act, 1972 and amendments thereof; tree plantation; training and awareness camps and procurement of GPS, Camera Traps etc.
17. A budget of Rs. 11.00 Lakhs has also been earmarked under Environment and Social Responsibility for the project. This includes health check-up camps; insurance cover to workers; assistance to local schools, panchayat; improvement of toilets and drinking water facilities and assistance to Self Help groups etc.
18. For the Environmental management Plan, a budget of Rs. 18.50 Lakhs as a capital cost and Rs. 5.80 Lakhs as a recurring cost has been earmarked for the protection of the environment. The activities include are monitoring of Air, Noise, Water pollution; water sprinkling, fencing for plantation; plantation; rainwater harvesting; roads repair and maintenance and survey for sedimentation in riverbed.
19. It was also mentioned that the amount of Rs. 1.30 crores/annum (i.e. 10% of lease amount/annum) for 10 years shall be deposited to the DC Office, Palwal and the panchayat of Chandhut village may approach DC office and request for this amount for development works in the village.

Thereafter, public opinion on environmental issues due to the proposed project was sought. Ms. Akansha Tanwar, Regional officer, Palwal, HSPCB asked the public to submit their queries/ suggestions.

Pointwise Questions and Reply presented to the Public

S. No.	Name and Address	Objection and Suggestions	Reply by PP	Action Plan
1	Kiran pal Village: - Chandhut	As per govt. record, out of total land, my 80% land is coming in the leased area and 20% area is under floodplain area of Yamuna. We cultivate these lands and not happy with govt. decision. Govt. has provided these lands to us after Chakbandi. We request govt. not to excavate our land.	The leased out land has been provided by Govt. of Haryana. For any revenue land issue, DC office may be contacted.	If any compensation will be decided by DC, Palwal, that will be paid by Project Proponent.
2	Unknown	What will be done	Water sprinkling will be	A budget of Rs. 10 lakhs

S. No.	Name and Address	Objection and Suggestions	Reply by PP	Action Plan
	Village: Chandhul	to suppress dust emission due to movement of vehicles and machineries?	done to minimize dust emission. Plantation along approach roads shall also be undertaken to reduce dust emission.	for Water Sprinkling, Rs. 13.50 lakhs for Plantation, Rs. 5.5 lakhs for haul road repair and maintenance have been earmarked under Environmental Management Plan budget.

SDM, Palwal said that land related issue will be discussed with DC, Palwal and any decision regarding this shall be informed to villagers. She again asked the public to ask environment related questions.

As there were no further questions, Ms. Akansha Tanwar, Regional Officer, Palwal, HSPCB, closed the ceremony of Public Hearing with the permission of SDM, Palwal.

During the public hearing, it was observed that participants from nearby villages were satisfied with the answers given by the representatives of project proponent regarding questions raised by participants.

Ms. Akansha Tanwar, Regional Officer, Palwal, HSPCB thanked the public for attending the public hearing.

The Public Hearing was concluded with a vote of thanks to the chair.


Jyoti
Sub-Divisional Magistrate,
Palwal


Akansha Tanwar,
Regional Officer, Palwal
Haryana State Pollution Control Board

Deputy Commissioner
PALWAL

ATTENDANCE

Mining of Sand (Minor Mineral) from the Reverbed of Yamuna River (Chandhut South Unit) with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in chandhut south village Palwal Tehsil & District of Haryana State-
Regarding Submission of Draft EIA (Environment Impact Assessment) Report for conducting Public Hearing as per provision of EIA notification 2006 (amended thereof).

ATTENDANCE

No.	Name	Address	Mobile No.	Present
1	Yash	2011, Bahwal	9700000000	
2	Kansha	102, 102 CB	8100000000	
3	Prabhat Raj	AET, NSPCL	9600000000	
4	Sapna (Rohit)	Sarpanch	8130990950	
5				
6	Arun	Chandhat	9996658962	
7	Rakesh	Chandhat	8570096964	
8	Krishan	Chandhat	9996979745	
9	Garima	Chandhat	9996979745	
10	Vijaypal	Chandhat	91550506500	
11	Suresh Kumar	Chandhat	9910870356	
12	Rajendra	Chandhat	9910870356	
13	Prabhsingh Bagra	Chandhat	8439547401	
14	Simran	Chandhat	7389557977	
15	Nirmala Sharma M-I	Mung Dept. Htd	702 7015113	
16	Garima			

No.	Name	Address	Mobile No.
17	Chander	Chandhat	9813652112
18	अमित	अमित	9813652112
19	अमित	Chandhat	9813540771
20	Bull		9844670127
21	Balbir Singh	Mohbedi Pur	91971110055
22	Kapil	Fakhimpur	90677004
23	Mohit	Khatka	9709014430
24	Deepak	chandhat	9050474708
25	Manoj Kumar	Chandhat	7015941370
26	Zulab	Bazali	9996636496 (land)
27	Deepak	Chandhat	8058-5050 (land)
28	Nikhil	Bazoli	
29	Rahul	chandhat	8396000000
30	Ravi	chandhat	9729949559
31	Rajendra das	Mumbai	9992101953
32			

No	Name	Address	Mob. No.	Signature
33	Douglas	Rohimpur	1641419111	
34	Lakshay	II	9253021619	
35	Gourav	II	864161757	
36	Gemini	II	708210816	
37	Ravi	Amroli	7027973177	
38	Aman	Rohimpur	9729538303	
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Deputy Commissioner
PALWA

कार्यालय उपायुक्त/जिलाधीश, पलवल।**Deputy Commissioner/District Magistrate Office, Palwal**

(E-mail id: dcpwl@hry.nic.in)

Email

From

Deputy Commissioner,
Palwal.

To

Sub Divisional Officer (C),
Palwal.

No. 9824 /M.B-2 Dated: 23-10-24

Subject:- Mining of Sand (Minor Mineral) from the Reverbed of Yamuna River (Chandhut South Unit) with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in chandhut south village Palwal Tehsil & District of Haryana State- Regarding Submission of Draft EIA (Environment Impact Assessment) Report for conducting Public Hearing as per provision of EIA notification 2006 (amended thereof).

This is to inform you that in connection with the above mentioned subject, Public Hearing has been fixed for 24.10.2024 at 11.00 AM in Chandhut South village Palwal Tehsil & District Palwal in respect to Environment Clearance for the unit M/s Apex project works Private Limited as per provision of EIA.

In view of the above you are hereby deputed to conduct above Public Hearing on behalf of undersigned and take action as per rule.


Deputy Commissioner,
Palwal.

Endst. No. 9825 /M.B-2 Dated: 23-10-24

A copy is forwarded to Regional Officer, HSPCB, Palwal Region, Palwal w.r.t. to their office letter no. HSPCB/PAL/2023/351 dated 08.08.2024 and this office letter no. 6064/M.B.-2 dated 04.09.2024 & 9794/M.B.-2 dated 23.10.2024 for information & necessary action.


Deputy Commissioner,
Palwal.

कार्यालय सपायुक्त/जिलाधीश, पलवल।

Deputy Commissioner/District Magistrate Office, Palwal

(E-mail id: depwl@hry.nic.in)

From

Deputy Commissioner,
Palwal.

Email

To

Additional Deputy Commissioner,
Palwal.

No.

9793 /M.B-2

Dated: 23-10-2024

Subject:-

Mining of Sand (Minor Mineral) from the Reverbed of Yamuna River (Chandhut South Unit) with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in Chandhut south village Palwal Tehsil & District of Haryana State- Regarding Submission of Draft EIA (Environment Impact Assessment) Report for conducting Public Hearing as per provision of EIA notification 2006 (amended thereof).

This is to inform you that in connection with the above mentioned subject, Public Hearing has been fixed for 24.10.2024 at 11.00 AM in Chandhut South village Palwal Tehsil & District Palwal in respect to Environment Clearance for the unit M/s Apex project works Private Limited as per provision of EIA.

In view of the above you are hereby deputed to conduct above Public Hearing on behalf of undersigned and take action as per rule.



Deputy Commissioner,
Palwal.

Undst. No.

9794 /M.B-2

Dated: 23-10-2024

A copy is forwarded to Regional Officer, HSPCB, Palwal Region, Palwal w.r.t. to their office letter no. HSPCB/PAL/2023/351 dated 08.08.2024 and this office letter no. 6064/M.B.-2 dated 04.09.2024 for information & necessary action.



Deputy Commissioner,
Palwal.

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

18-09-2024

To

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

Sub: Public hearing Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut South Unit) with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in Chandhut South Village, Palwal Tehsil & District of Haryana State- Regarding submission of Draft EIA (Environment Impact Assessment) Report for conducting Public Hearing as per provision of EIA notification 2006 (amended thereof) M/s APEX PROJECT WORKS.

I have been directed to enclose herewith an advertisement regarding Public Hearing to be held on **24.10.2024 at 11:00 AM** in respect to Environment Clearance for the unit M/s APEX PROJECT WORKS 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 Hindi.

The advertisement should appear on or before **23.09.2024** 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.

It is further, informed that Ministry of Environment of Forest & Climate Change Govt. of India has clarified vide Memo No. F.No. 19-206/2018-IA.III dated 19.04.2024 that publication of Public Notice for public Hearing does not violate the model code of conduct during the election (copy enclosed).

DA/Advertisement

Signed by

Vikas Chand

Date: 18-09-2024 10:31:59

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.

1

No. HSPCB-060001(0014)-12/2024-SOLID WASTE MANAGEMENT CELL-HSPCB (Computer No. 1092948)
 I/258087/2024
 I/258087/2024

DA/Advertisement.

Env. Engineer (HQ)
 For Member Secretary

CC:

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 APEX PROJECT WORKS Shop No. 1, Manjeet Filling Station, Near Yamuna Pur, Manglora, Manglora, KARNAL, HARYANA Manjeet Filling Station, 132001
3. Sr. EE (IT) to ensure that the notice is uploaded on the website of the Board.

DA/Advertisement.

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, Forests & Wildlife Department.
2. The Director General, Environment, Forests & Wildlife Department, Haryana.
3. PS to Chairman / PA to Member Secretary.

DA/Advertisement

Env. Engineer (HQ)
 For Member Secretary

I/258064/2024

HARYANA STATE POLLUTION CONTROL BOARD
C-11, SECTOR-6, PANCHKULA
 Website-www.hspcb.org.in
 E-Mail- hspcb-solidwaste@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 for obtaining Environment Clearance for Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut South Unit) with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in Chandhut South Village, Palwal Tehsil & District of Haryana State. The project is covered under the ambit of Environment Impact Assessment Notification dated 14th Sep, 2006 issued by the Ministry of Environment, Forest and Climate Change Department, GOI, thus required to obtain Environmental Clearance. The detail of the unit/project and date, time & venue of Public Hearing is given as under:-

Sr. No.	Name of Unit	Date of Public Hearing	Time of Public Hearing	Venue of Public Hearing
1.	M/s APEX PROJECT WORKS Shop No. 1, Manjeet Filling Station, Near Yamuna Pul, Village-Manglora, , KARNAL, HARYANA, , 132001, , as per TORs issued by the Government of India Ministry of Environment, Forest and Climate Change (Issued by the State Level Expert Appraisal Committee(SEAC), HARYANA) vide their letter dated 12.06.2024.	24.10.2024	11:00 AM	Village Chandhut Tehsil & District Palwal

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 officers 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 of the publication of this notice. Besides, a 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 Groups, and others, located at the project site/sites of displacement/sites likely to be affected. Oral/Written suggestions, if any be admissible for attending the Public Hearing.

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

HSPCB-060001(0014)/12/2024-SOLID WASTE MANAGEMENT CELL-HSPCB

I/258064/2024

Pardeep Kumar, IAS
Member Secretary



Regional Office, Palwal Region
Haryana State Pollution Control Board
II - Floor , HSVP Office Complex,
Near Gymkhana Club, Sector -12, Palwal-121102
 Website - www.hspcb.gov.in E-Mail - hspcbropal@gmail.com



HSPCB/PAL/2024/462

Date: 04.09.2024

To,
 The Member Secretary
 Haryana State Pollution Control Board
 Panchkula.

Sub: Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut South Unit) with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in Chandhut South Village, Palwal Tehsil & District of Haryana State- Regarding Submission of Draft EIA (Environment Impact Assessment) Report for Conducting Public Hearing as per provision of EIA notification 2006 (amended thereof).

Ref DC office letter No. 6064/MB-2 dated 04.09.2024

In this connection, it is submitted that Draft EIA/EMP report for the above said project for conducting Public Hearing as per EIA notification, 2006 has been received in this office on the 08.08.2024 public hearing fee has been deposited by the project proponent in our head office.

As per the EIA notification 14th Sept., 2006 amended till date" The District Magistrate/ District Collector/ Deputy Commissioner or his or her representative not below the rank of an Additional District Magistrate assisted by a representative of SPCB or UTPCC, shall supervise and preside over the entire public hearing process".

This office has sent a letter to Deputy commissioner with the request to provide date and time for conducting the public hearing of above said project. Thereafter, date and time was accorded by the Deputy commissioner vide letter No. 6064/MB-2 dated 04.09.2024. So, that same could be advertised in one major Newspaper Daily Newspaper/ Local Newspaper as per per procedure of EIA notification 14th Sept. 2006 amended till date through our head office.

The date of hearing is fixed for 24.10.2024 at 11:00 AM, at Village Chandhut Tehsil & District Palwal.

Submitted for kind information and further necessary action please.

AKANSHA Digitally signed by
AKANSHA TANWAR
TANWAR Date: 2024.09.04
15:53:21 +05'30'

Regional Officer
Palwal Region
Dated : 04.09.2024

Endst.No. HSPCB/PAL/2024/463-465

A copy of above is forwarded to the following for kind information and further necessary action please.

1. The Deputy Commissioner, Palwal.
2. The Senior Environmental Engineer (SWM), Haryana State Pollution Control Board, Panchkula
3. The Senior Environmental Engineer (Cord. Cell), Haryana State Pollution Control Board, Panchkula

AKANSHA Digitally signed by
AKANSHA TANWAR
TANWAR Date: 2024.09.04
15:53:41 +05'30'
Regional Officer
Palwal Region



उपायुक्त/जिलाधीश कार्यालय, पलवल।
Deputy Commissioner/District Magistrate Office, Palwal.

निजी ध्यानार्थ/ अति आवश्यक

प्रेषित,

क्षेत्रीय अधिकारी,
हरियाणा राज्य प्रदूषण नियंत्रण बोर्ड,
पलवल।

विषय:-

क्रमांक 8064 /एम0बी0-2 दिनांक:- 04/09/2024
Mining of Sand (Minor Mineral) from the Reverbed of Yamuna River (Chandhut South Unit) with an annual production capacity of 43,35,000 MT over an area of 98.156 hectares (245.39 acres) in chandhut south village Palwal Tehsil & District of Haryana State- Regarding Submission of Draft EIA (Environment Impact Assessment) Report for conducting Public Hearing as per provision of EIA notification 2006 (amended thereof).

Ref. HSPCB Head office letter No. 1/255354/2024 dated 01.08.2024.

उपरोक्त विषय पर आपके कार्यालय के पत्र क्रमांक HSPCB/PAL/2023/351 दिनांक 08.08.2024 के सन्दर्भ में।

विषयोक्त मामले में माननीय उपायुक्त महोदय के आदेश दिनांक 01.09.2024 की पालना में आपको लिखा जाता है कि आप द्वारा किए गए अनुरोध अनुसार उपायुक्त महोदय, पलवल द्वारा उक्त कार्यक्रम/कार्य (आमजन सुनवाई) हेतु दिनांक 24.10.2024 समय प्रातः 11:00 बजे निश्चित की गई है। यह आपको सूचनार्थ एवं नियमानुसार आगामी आवश्यक कार्यवाही हेतु प्रेषित है।


कृते: उपायुक्त, पलवल।

CC: PA to Ld. DC/Reader to CTM.



हरियाणा राज्य प्रदूषण नियंत्रण बोर्ड
जन सुनवाई में सभी प्रतिभागियों का स्वागत करता है

पर्यावरण स्वीकृति के लिए जन सुनवाई
यमुना नदी के चौदहत (दक्षिणी) इकाई के तल से रेत (लघु खनिज) का खनन
गांव चौदहत दक्षिण - तहसील और जिला पलवल एवं राज्य हरियाणा
अधिकतम उत्पादन क्षमता - 43,35,000 मीट्रिक टन/वर्ष
क्षेत्रफल- 98.156 हेक्टेयर

दिनांक: 24.10.2024, समय: सुबह के 11:00

कार्यक्रम का स्थान:

गांव चौदहत दक्षिण, जिला पलवल

आयोजक:

मैसर्स एम्बेस प्रोजेक्ट वर्क्स
हरियाणा।

पर्यावरण रक्षक/कारक

परिेश पर्यावरण इंजीनियरिंग संस्थान

नबेट प्रमाणन संख्या - NABET/EIA/2124/IA 0092

(Rev. 01)

आयोजक :

हरियाणा राज्य प्रदूषण नियंत्रण बोर्ड

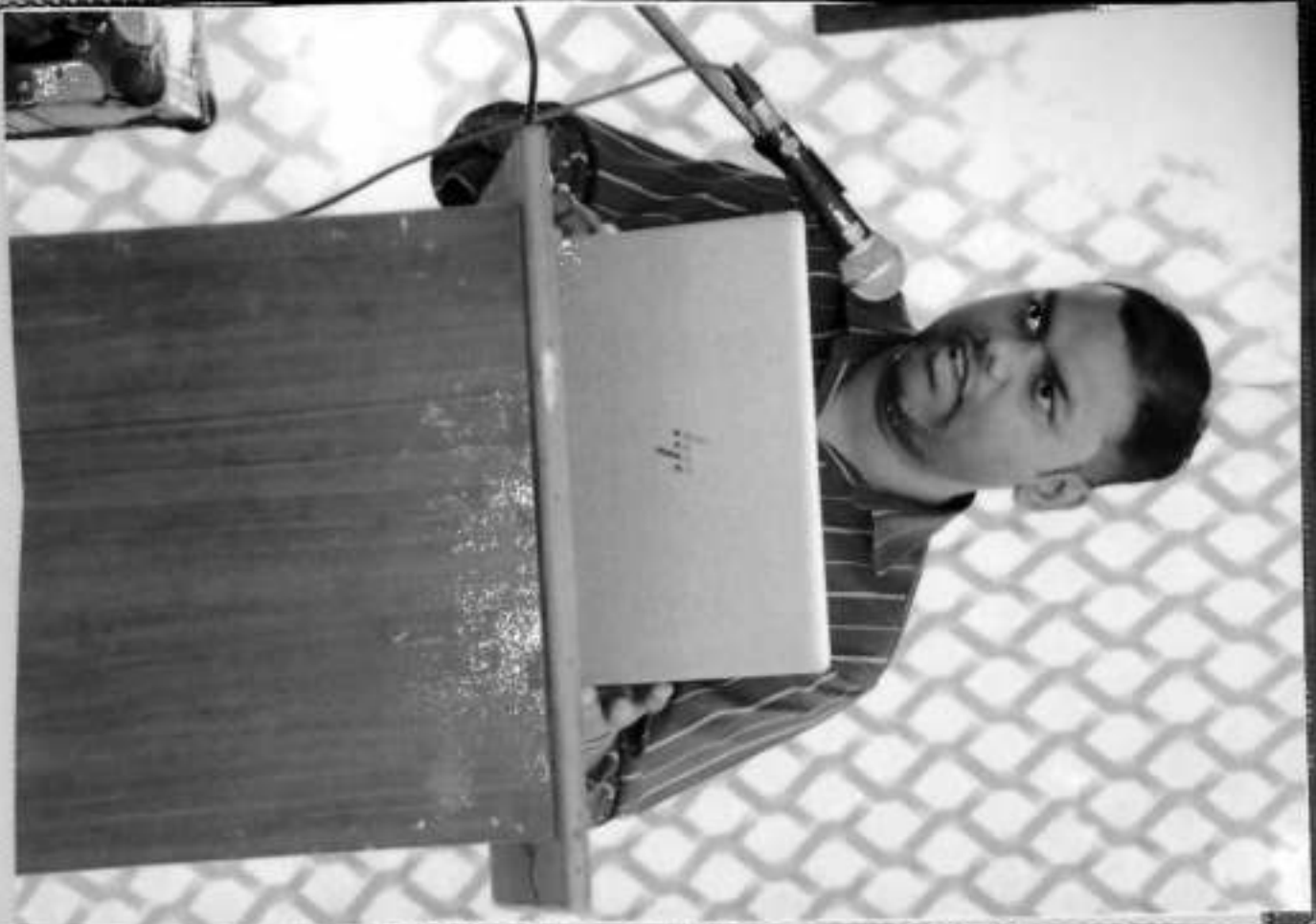














M/2124/1/A 0092

विद्यया ऽपि युक्तं धनं कुरुते

विद्यया







DRAFT ENVIRONMENT IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut South Unit)

Production Capacity - 43,35,000 MT/ year

Area - 98.156 ha

Village Chandhut South, Tehsil & District Palwal and State Haryana.



PROPONENT	:	M/S APEX PROJECT WORKS
ENVIRONMENT CONSULTANT	:	PARIVESH ENVIRONMENTAL ENGINEERING SERVICES Nabet Certificate No. - NABET /EIA/2124/IA 0092 (Rev.01)
STUDY PERIOD	:	PRE-MONSOON (MARCH TO MAY 2024)
VERSION	:	PEES/EIA/23-24/36

JULY 30 2024

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

TABLE OF CONTENT

1. Introduction	1
1.1. Project Brief	1
1.2. Nature of the Project	4
1.2.1. Need for the Project and Its importance to the Country and or Region	4
1.2.2. Demand-Supply Gap	4
1.2.3. Imports vs. Indigenous Production	5
1.2.4. Export Possibility	5
1.3. Location of the Project	5
1.4. Purpose of the Report	8
1.5. The Study	9
1.5.1. Scope of the Study	40
1.5.2. Methodology of the Study	41
1.6. Environment Clearance Process.....	41
1.7. Legislative & Regulatory Framework	43
1.8. Report Structure	43
2. Project Description	45
2.1. General.....	45
2.2. Location of Project.....	45
2.3. Mine Details.....	45
2.3.1. Topography & Drainage	45
2.3.2. Drainage Pattern / Mine Drainage	46
2.4. Geology of the Area	48
2.4.1. Regional Geology	48
2.4.2. Local Geology.....	50
2.4.3. Replenishment Plan.....	52
2.4.4. Exploration of Area	56
2.4.5. RESERVE	56
2.5. Mining Methodology	59
2.5.1. Proposed Method	59
2.5.2. Details of Production & Dispatches of Five Years	60
2.5.3. Proposed Method of Mining	61
2.5.4. Extent of Mechanization.....	64
2.5.5. Water Demand	65
2.5.6. Electricity Requirement.....	65
2.5.7. Mode of Transportation.....	65
2.5.8. Manpower Requirement.....	65
2.5.9. Drilling & Blasting	65

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

2.5.10.	Mine Drainage	66
2.6.	Conceptual Development Plan	66
2.6.1.	Land-Use Pattern	66
2.6.2.	Environment Management Plan	67
2.7.	Progressive Mine Closure Plan	69
2.7.1.	Mined-Out Land	69
2.7.2.	Water Quality Management	69
2.7.3.	Air Quality Management	70
2.7.4.	Waste Management	70
2.7.5.	Topsoil Management	70
2.7.6.	Tailing Dam Management	70
2.7.7.	Infrastructure	70
2.7.8.	Disposal of Mining Machinery	70
2.7.9.	Safety & Security	70
2.7.10.	Disaster Management and Risk Assessment	70
2.7.11.	Care and Maintenance during Temporary Discontinuance	71
2.8.	Stacking of Mineral Rejects & Disposal of Waste	72
2.9.	Summary	72
3.	Description of Environment	73
3.1.	Introduction	73
3.2.	Study Area & Period	74
3.2.1.	Methodologies Adopted	74
3.2.2.	Primary Data Collection Methodologies	74
3.2.3.	Secondary Data Collection	75
3.3.	Physical Environment	75
3.3.1.	Seismic Status of Study Area	75
3.3.2.	Land-Use Details	77
3.3.3.	Soil Environment	80
3.4.	Water Environment	83
3.4.1.	Hydrogeology (Aquifer System)	83
3.4.2.	Trend / Behaviour to Ground Water Level	84
3.4.3.	Status of Ground Water Development	84
3.4.4.	Water Level Fluctuation in Study Area	84
3.4.5.	Rainfall & Climate	85
3.4.6.	Ground Water Quality	85
3.4.7.	Surface Water Quality	88
3.5.	Meteorological Condition	90
3.5.1.	Meteorological Data as per IMD Gurugram (Haryana)	90
3.5.2.	Onsite Micro-Meteorology (Hourly)	91

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

3.6.	Air Environment	92
3.6.1.	Monitoring Methodology, Parameters & Locations.....	92
3.6.2.	Air Quality of Study Area	94
3.7.	Noise Environment	95
3.7.1.	Ambient Noise Level Monitoring Stations.....	95
3.7.2.	Frequency & Parameters of Sampling	95
3.7.3.	Ambient Noise Level Monitoring Locations	95
3.7.4.	Method of Monitoring	96
3.7.5.	Ambient Noise Level in Study Area.....	97
3.8.	Biological Environment.....	98
3.8.1.	Objective of Biological Study	98
3.8.2.	Environmental Sensitivity of the Study Area.....	99
3.8.3.	Forest Cover in Palwal District	100
3.8.4.	Ecology of the Study Area	101
3.8.5.	Floral Ecology.....	102
3.8.6.	Faunal Diversity.....	107
3.8.7.	Aquatic Ecology	109
3.9.	Socioeconomic Environment	111
3.9.1.	Census & Demographic Status of Palwal District	111
3.10.	Conclusion.....	117
4.	Anticipated Environmental Impacts & Mitigation Measures	118
4.1.	General.....	118
4.2.	Impact Assessment	118
4.3.	Identification of Impacts	119
4.4.	Impacts on Land-use and Mitigation Measures	119
4.4.1.	Identified Impact on Land-Use	119
4.4.2.	Mitigation Measures for Impacts on Land-Use.....	119
4.4.3.	Conclusion	120
4.5.	Impact on Ambient Air Quality	120
4.5.1.	Identified Anticipated Impact on Ambient Air Quality.....	120
4.5.2.	Impact Assessment on Air Quality due to Operation	121
4.5.3.	Air Dispersion Modelling.....	121
4.5.4.	Mitigation Measures for Air Pollution.....	124
4.5.5.	Biological Method for Dust Control	125
4.5.6.	Conclusion	125
4.6.	Impact on Road due to Traffic Movement	125
4.6.1.	Traffic Projection after Implementation of Mining Project	125
4.6.2.	Traffic Management and Mitigation Measures	128
4.7.	Impact on Noise & Vibration	128

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

4.8.	Impact on Water	129
4.9.	Impact on Soil Environment and mitigation measures	130
4.10.	Impact on Hydrology and Mitigation measures	130
4.11.	Biological Environment.....	131
4.12.	Impact on Socio-Economic Environment.....	132
4.12.1.	Positive Impact.....	133
4.12.2.	Negative Impact	133
4.13.	Impacts on Solid Waste/ Over Burden & Mitigations.....	134
4.14.	Impacts on Occupational Health & Safety	134
4.15.	Mine Closure Plan	135
4.16.	Conclusion.....	135
5.	Analysis of Alternatives (Technology & Site)	136
5.1.	Introduction	136
5.2.	Alternative of Mines	136
5.3.	Alternative for Technology and Other Parameters	136
5.4.	Environmental Attributes Management and Mitigation	137
6.	Environment Monitoring Plan.....	138
6.1.	Introduction	138
6.2.	Environmental Management Cell	138
6.2.1.	Hierarchy.....	139
6.2.2.	Responsibilities for Environmental Management Cell.....	139
6.3.	Environmental Monitoring and Reporting Procedure	139
6.4.	Reporting Schedule during Operation of Mine.....	140
6.5.	Monitoring Budget	140
6.6.	Conclusion.....	140
7.	Additional Studies.....	141
7.1.	General.....	141
7.2.	Public Hearing & Consultation	141
7.3.	Hazard Identification and Risk Assessment Methodology	141
7.3.1.	Inundation/Flooding	142
7.3.2.	Slope Failure at the Mine faces or stacks.....	142
7.3.3.	Quicksand Condition.....	142
7.3.4.	Drowning.....	143
7.3.5.	Accident due to Vehicular Movement	143
7.3.6.	Accident during Sand loading and Transportation.....	143

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

7.3.7.	Occupational Health Hazard	143
7.4.	Disaster Management Plan & Mitigation Measures.....	145
7.4.1.	Mitigation Hazards	146
7.4.2.	Safety, Health & Environmental (SHE) Policy	149
7.4.3.	Planning	150
7.4.4.	Implementation of Occupational Health & Safety Measures	151
7.4.5.	Annual Replenishment of Mineral	151
7.4.6.	Rehabilitation and Resettlement	152
7.5.	Conclusion & Summary	152
8.	Project Benefits	153
8.1.	Introduction	153
8.2.	Physical Benefits	153
8.3.	Budget allocation for EMP	154
8.4.	Summary	154
9.	Environmental Cost Benefit Analysis.....	155
10.	Environment Management Plan	156
10.1.	Introduction	156
10.2.	Land Use Pattern.....	156
10.3.	Air Environment Management	156
10.4.	Noise Level Environment and Vibration	157
10.5.	Water Management	158
10.6.	Solid Waste Management	158
10.7.	Green Belt Development	158
10.8.	Socio-economic Assurance	159
10.8.1.	Environmental & Social Responsibility.....	159
10.8.2.	Litigations against the Project Proponent	160
10.8.3.	Occupational Health and Safety	160
10.9.	Financial Assurance	161
10.10.	Environment Management Protection Plan (EMP)	162
10.11.	Rehabilitation and Resettlement (R&R).....	162
10.12.	Summary	163
11.	Summary & Conclusion	164
11.1.	General.....	164
11.2.	Analysis of Alternative	166
11.3.	Description of Baseline Environment	166

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

11.4.	Anticipated Environmental Impact and Mitigation Measures	167
11.5.	Environmental Monitoring Program	168
11.6.	Additional Studies	169
11.7.	Project Benefit	169
11.8.	Cost of Environment Management Plan	169
11.9.	Conclusion.....	169
12.	Disclosure of Consultant	171
12.1.	Organizational Profile	171
12.2.	Consultancy Services	171
12.3.	Disclosure of Consultants Engaged	171
12.4.	Declaration by the Head of the Accredited Consultant Organization.....	175

LIST OF TABLES

Table 1-1:	Approvals / Permissions from Concerned Authorities	1
Table 1-2:	Salient Features of Mine	2
Table 1-3:	Pointwise Compliance of Terms of Reference	9
Table 1-4:	Environmental Attributes and Frequency of Monitoring	40
Table 1-5:	Key Environmental Legislation	43
Table 2-1:	Levels of Riverbed and Riverbank	47
Table 2-2:	Regional Geology of Palwal District	49
Table 2-3:	Basin Area of Yamuna River	54
Table 2-4:	Details of Bulk Density	57
Table 2-5:	Geological Reserve Estimation	58
Table 2-6:	Details of Year-wise Production	59
Table 2-7:	Details of Five-Year Production	60
Table 2-8:	Details of Proposed Year-wise Production of Mineral & OB/Waste	60
Table 2-9:	List of Machinery	64
Table 2-10:	Fuel Consumption / Day	65
Table 2-11:	Manpower Requirement	65
Table 2-12:	Land-Use Breakup at Present and Conceptual Stage	67
Table 2-13:	Environmental Plan	68
Table 3-1:	Detailed of Secondary Data Collection	75
Table 3-2:	Land-use Classification of the Study Area	78
Table 3-3:	Land-use Classification of the Project Site	80
Table 3-4:	Soil Sampling Locations	81
Table 3-5:	Soil Classification Standards as per ICAR	82
Table 3-6:	Soil Quality Results	82
Table 3-7:	Ground Water Level Fluctuation in Area	85
Table 3-8:	Ground Water Sampling Location.....	86

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Table 3-9:	Ground Water Results	87
Table 3-10:	Surface Water Sampling Location	88
Table 3-11:	CPCB Water Quality Criteria	88
Table 3-12:	Surface Water Results	89
Table 3-13:	Meteorological Table as per IMD, Gurugram (1981-2010)	90
Table 3-14:	On-site Micro Meteorological Data	91
Table 3-15:	Ambient Air Monitoring Locations	92
Table 3-16:	Ambient Air Quality Results	94
Table 3-17:	Mineralogical Composition of PM10	94
Table 3-18:	Ambient Noise Monitoring Locations	95
Table 3-19:	Ambient Noise Level (CPCB Standards)	97
Table 3-20:	Ambient Noise Quality Result	97
Table 3-21:	Mode of Data Collection and Parameters	98
Table 3-22:	Environmental Settling of Study Area (15km Buffer)	99
Table 3-23:	Forest cover of State and Project Affected District	100
Table 3-24:	Reserve Forest Area details around the proposed Mine Site	100
Table 3-25:	Floral Checklist of Buffer Zone	103
Table 3-26:	Plants of Medicinal Importance & Other Allied Uses	104
Table 3-27:	Plants of Medicinal Importance & Other Allied Uses	107
Table 3-28:	Faunal Checklist of Buffer Zone	107
Table 3-29:	Macrophytes in Aquatic Habitats	110
Table 3-30:	List of Phytoplankton from Study Area	110
Table 3-31:	List of Zooplanktons from Study Area	110
Table 3-32:	List of Fishes from Study Area	111
Table 3-33:	Palwal District Population	112
Table 3-34:	Palwal District Demography	113
Table 3-35:	Demographic Structure of the Study Area	114
Table 3-36:	Population Distribution of the Study Area	114
Table 3-37:	Literacy Rate of the Study Area	115
Table 3-38:	Occupational Structure of the Study Area	115
Table 3-39:	Education and Medical Facilities of the Study Area	115
Table 3-40:	Drinking Water Facilities in the Study Area	116
Table 3-41:	Land Use Classification in the Study Area	116
Table 4-1:	Types of Impact due to Mining Activity	118
Table 4-2:	Impact Identification Matrix	119
Table 4-3:	Predominant Source of Air Pollution	120
Table 4-4:	Identified Impacts of Air Pollutions on Human, Animals and Plants	121
Table 4-5:	Emission Rate Estimation	122
Table 4-6:	Concentration in respect of distance	123
Table 4-7:	Vehicle Emission Statement	124
Table 4-8:	Incremental Pollution due to Vehicular Transportation	124
Table 4-9:	Impacts of Air Pollution and Mitigation Measures	124
Table 4-10:	Details of Average Annual Daily Traffic (AADT) and PCUs	126

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Table 4-11:	Detail of PCUs Factor as per IRC	127
Table 4-12:	V/C Ratio and Level of Service (LOS) as per IRC	127
Table 4-13:	Existing Traffic Scenario & Level of Service (LOS)	127
Table 4-14:	Traffic Scenario with Operation of Mine & Level of Service (LOS)	127
Table 4-15:	Impact on Noise, Vibration & Mitigation Measures	128
Table 4-16:	Impact on Water Regime and Its Mitigation Measures	129
Table 4-17:	Water Demand Estimation & Budget	129
Table 4-18:	Impact on Soil Environment and Its Mitigation Measures	130
Table 4-19:	Impact on Hydrology and Its Mitigation Measures	131
Table 4-20:	Impact on Ecology due to Mining Activity and Its Mitigation Measures 131	
Table 4-21:	Impact on Socio-economic and Its Mitigation Measures	133
Table 4-22:	Impact on Occupational Health & Safety and Mitigation	134
Table 5-1:	Alternative Technology & Other Parameters	136
Table 6-1:	Environmental Management Plan, Activities & Implementation	138
Table 6-2:	Monitoring Methodologies and Parameters	140
Table 7-1:	Risk Level Matrix	144
Table 7-2:	Identification of Likely Risks in Sand Mining from Riverbed	145
Table 7-3:	Details of Prevent Occupational Hazard	149
Table 8-1:	Project Benefits in Respect to Different Aspects	153
Table 10-1:	Purpose & Design of Environment Management Plan	156
Table 10-2:	Air Pollution, Management & Monitoring	157
Table 10-3:	Noise Level Pollution, Management & Monitoring	158
Table 10-4:	Water Pollution & Management	158
Table 10-5:	Plantation Details	159
Table 10-6:	Post Plantation Care	159
Table 10-7:	Facilities & Budget under ESR Initiatives & OHS	161
Table 10-8:	Financial Assurance Calculation	162
Table 10-9:	Environment Management Budget	162
Table 11-1:	Salient Features of Mine	164
Table 11-2:	Baseline Status	167
Table 12-1:	EIA Co-ordinator Details	172
Table 12-2:	List of Functional Experts	172

LIST OF FIGURES

Figure 1.1:	Location Map of Proposed Project	5
Figure 1.2:	Co-Ordinates Map with 500 m Buffer from Proposed Site	6
Figure 1.3:	Base Map with 2 km Buffer Showing Site Features	7
Figure 1.4:	Google Map with 10 km Buffer from Proposed Site	8
Figure 1.5:	Schematic Diagram for Environmental Clearances Process	42
Figure 2.1:	Contour Map with 100m Buffer Site Elevation / Slope	46

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Figure 2.2:	Drainage Map of Study Area (10 km)	47
Figure 2.3:	Elevation / Slope Profile of Study Area	48
Figure 2.4:	Geology Map of Haryana State	49
Figure 2.5:	Size Distribution of Mineral	51
Figure 2.6:	Surface Geological Plan & Section of Lease	58
Figure 2.7:	Working / Production Plan	61
Figure 2.8:	Reclamation Plan	67
Figure 3.1:	Study Area Map (10 km Buffer) of Proposed Site	73
Figure 3.2:	Earthquake Hazard Map of Haryana	76
Figure 3.3:	Land-Use Map of Study Area (10 km Buffer)	78
Figure 3.4:	FCC Imagery of Study Area (10 km Buffer)	79
Figure 3.5:	Land-Use Map of Project Site	80
Figure 3.6:	Soil Sampling Locations	81
Figure 3.7:	Pre-Monsoon (May 2012) & Post-Monsoon (November 2012) Water Level 84	
Figure 3.8:	Water Level Fluctuation of Pre-monsoon and Post-monsoon	85
Figure 3.9:	Water Sampling Locations	86
Figure 3.10:	Wind Pattern as per IMD Gurugram & Onsite	92
Figure 3.11:	Ambient Air Monitoring Locations	93
Figure 3.12:	Ambient Noise Level Locations	96
Figure 3.13:	Environment Sensitivity Map (15 km Buffer) of Proposed Site	101
Figure 3.14:	Population & gender Ration of Study Area	114
Figure 3.15:	Literacy Rate & Worker Status of Study Area	115
Figure 4.1:	Concentration of Fugitive Dust v/s Distance (Uncontrolled)	122
Figure 4.2:	Concentration of Fugitive Dust v/s Distance (Controlled)	123
Figure 4.3:	Transportation Route & Survey Location	126
Figure 4.4:	Water Balance Diagram	130
Figure 4.5:	Impact of Mining on Ground Water	131
Figure 7.2:	Floor Hazard Map of Haryana State	142

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

LIST OF ANNEXURES

Annex 1.1	Lease Grant	01
Annex 1.2	Cluster NOC	01
Annex 1.3	Mining Plan	01
Annex 1.4	Forest NOC	02
Annex 1.5	Approved District Survey Report	02
Annex 1.6	Terms of Reference issued by SEIAA, Haryana	09
Annex 3.1	On Site (Hourly) Micro-Meteorology Data	74
Annex 3.2	Monitoring Results & Monitoring Photographs	77
Annex 3.3	Wildlife Conservation Plan	92
Annex 7.1	Minutes of Public Hearing	128
Annex 10.1	CA Certificate for project cost	153
Annex 12.1	QCI NABET Certificate (Environment Consultant)	162
Annex 12.2	NABL Certificate (Laboratory)	162
Additional Annexures		
AA-1	Undertaking of Consultant Engagement	-
AA-2	Affidavit by Consultant	-
AA-3	Affidavit by proponent	-
AA-3	Undertaking for no mining activity	-

CHAPTER – 01

INTRODUCTION

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 Apex Project Works, through Sh. Upender Kumar, Shop No.1, Manjeet Filling Station, Near Yamuna Pul, Village Manglora, District Karnal-132001, Haryana was the highest bidder (13.19 Crores) for the Sand quarries of Chandhut (Siuth) Unit for which auction notice was issued on 7th August 2023 vide notice no. DMG/HY/Auction/Palwal/2022/4443 and auction held on 12.09.2023. A Letter of Intent (LOI) has been issued by the Director Mines & geology Haryana vide letter No. DMG/HY/Chandhut (South) Unit/Palwal/2023/5727 dated 05.10.2023 for mining of Sand (Minor Mienral) in Chandhut (South) Unit, comprising Chandhut (South) village over an area of 98.156 ha (245.39 acres) in district Palwal, Haryana for a period of 10 years. The copy of LOI is enclosed as **Annex 1.1**.

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

This is the sand mine project on riverbed of Yamuna River. Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River with 43,35,000 MT/ year production over an area of 98.156 ha located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Based on the details published vide Haryana Government Gazette notification for auction dated 07-08-2023 & corrigendum no 4433 dated 12-09-2023 & LOI dated 05-10-2023 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 Chandhut (South) 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 2.4 kms.

Table 1-1: Approvals / Permissions from Concerned Authorities

NOCs	Approval / Permission Details	Annex.
Lease Grant	A Letter of Intent (LOI) has been issued by the Director Mines & geology Haryana vide letter No. DMG/HY/Chandhut (South) Unit/Palwal/2023/5727 dated 05.10.2023 for mining of Sand (Minor Mienral) in Chandhut (South) Unit, comprising Chandhut (South) village over an area of 98.156 ha (245.39 acres) in district Palwal, Haryana for a period of 10 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 Memo No. MO/FBD/3589 dated 20.11.2023 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

PROPONENT: M/S APEX PROJECT WORKS, HARYANA 43

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 1

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NOCs	Approval / Permission Details	Annex.
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/HY/MP/CHANDHUT SOUTH/PLWL/2024/2155 DATED 02.05.2024.	Annex 1.3
Forest NOC	Forest NOC has been issued by the Office of Divisional Forest Officer, Palwal Forest Division, Palwal vide reference no. 3693 dated 12.12.2023 which confirms project site is not part of any reserve forest or protected forest.	Annex 1.4
Approved DSR	Approved District Survey Report of Faridabad District has been obtained.	Annex 1.5

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 (Chandhut (South) Unit) by M/s Apex Project Works.
2.	Nature & category of Mine	Non-Coal Mining Category 'B' of Activity 1(B)
3.	Project Proponent	M/s Apex Project Works
4.	Khasra No.	<p>For Mining</p> <p>77//, 14, 15 min, 16 min, 17, 24 min, 25 min, 107//, 4 min, 7 min, 14 min, 15 min, 16 min, 17, 24, 25 min, 115//, 1 min, 10 min, 11 min, 12 min, 19 min, 20, 21, 22 min, 116//, 3, 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 23, 24, 25, 146//, 3, 4, 5, 6, 7, 8, 9, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20 min, 21 min, 22, 23, 24, 25, 147//, 1, 2 min, 3 min, 8 min, 9, 10, 11, 12, 13 min, 17 min, 18, 19, 20, 21, 22, 23, 24 min 151//, 10 min, 11 min, 12 min, 13 min, 18 min, 19, 20, 21, 22, 23, 24 min 152//, 17, 18, 19, 20, 21 min, 22 min, 23, 24, 25 153//, 1 min, 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12 min, 13 min, 14, 15, 16, 17 min, 18 min, 24 min, 25 min, 182//, 2 min, 3 min, 4, 5, 6, 7, 8 min, 13 min, 14, 15, 16, 17, 18 min, 23 min, 24, 25, 183//, 1, 2, 3, 4 min, 5 min, 6 min, 7, 8, 9, 10, 11, 12, 13, 14, 15 min, 16 min, 17, 18, 19, 20, 21, 22, 23, 24, 25, 186//, 1, 2, 3, 4, 5 min, 6 min, 7, 8, 9, 10, 11, 12, 13, 14, 15 min, 16 min, 17, 18, 19, 20, 21, 22, 23, 24, 25 min, 187//, 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12 min, 13, 14, 15, 16, 17, 18, 19 min, 21 min, 22 min, 23, 24, 25, 215//, 16 min 216//, 1 min, 2, 3, 4, 5, 6, 7, 8, 9, 10 min, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 min, 22 min, 23, 24, 25, 217//, 1, 2, 3, 4, 5 min, 6 min, 7 min, 8, 9, 10, 11, 12, 13, 14 min, 17 min, 18, 19, 20, 21, 22, 23 min, 220//, 1, 2 min, 3 min, 9 min, 10 min,</p>

PROPONENT: M/S APEX PROJECT WORKS, HARYANA 44

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 2

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S. No.	Parameters	Description																																																																											
		221// , 3 min, 4 min, 5, 6 min. 293 min. For Ancillary area 105// 21, 22, 23, 24, 25 118// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15.																																																																											
5.	Total Lease area	98.156 Ha (245.39 Acre) - Riverbed of Yamuna River																																																																											
6.	Location of the project	Village- Chandhut South, Tehsil & District- Palwal, Haryana																																																																											
7.	Toposheet No.	H43X8 - Project Site & G43F5, G43F9, H43X7, H43X8, H43X11 & H43X12 - Study Area.																																																																											
8.	Maximum Production Capacity	43,35,000 Metric Tonne / Year																																																																											
9.	Geological Mineral Reserve	49,25,880 Metric Tonne																																																																											
10.	Blocked Mineral Reserve	5,90,112 Metric Tonne																																																																											
11.	Mineable Reserve	43,35,768 Metric Tonne																																																																											
12.	Geographical co-ordinates	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">Chandhut (South)</td> </tr> <tr><td>A1</td><td>28° 7' 22.4796"N</td><td>77° 29' 23.399" E</td></tr> <tr><td>B1</td><td>28°7' 15.652" N</td><td>77°29' 21.692" E</td></tr> <tr><td>C1</td><td>28°6' 51.324" N</td><td>77°29' 38.139" E</td></tr> <tr><td>D1</td><td>28°6' 49.868" N</td><td>77°29' 45.677" E</td></tr> <tr><td>E1</td><td>28°6' 46.099" N</td><td>77°29' 50.988" E</td></tr> <tr><td>F1</td><td>28°6' 39.589" N</td><td>77°29' 55.700" E</td></tr> <tr><td>G1</td><td>28°6' 33.250" N</td><td>77°29' 54.415" E</td></tr> <tr><td>H1</td><td>28°6' 25.798" N</td><td>77°29' 51.588" E</td></tr> <tr><td>I1</td><td>28°6' 19.887" N</td><td>77°29' 46.534" E</td></tr> <tr><td>J1</td><td>28°6' 15.97" N</td><td>77°29' 36.67" E</td></tr> <tr><td>L1</td><td>28°6' 22.16" N</td><td>77°29' 24.65" E</td></tr> <tr><td>M1</td><td>28°6' 31.708" N</td><td>77°29' 29.316" E</td></tr> <tr><td>N1</td><td>28°6' 43.035" N</td><td>77°29' 33.998" E</td></tr> <tr><td>N2</td><td>28°6' 45.131" N</td><td>77°29' 32.411" E</td></tr> <tr><td>N3</td><td>28°6' 46.154" N</td><td>77°29' 24.476" E</td></tr> <tr><td>O1</td><td>28°6' 48.827" N</td><td>77°29' 18.139" E</td></tr> <tr><td>O2</td><td>28°6' 52.236" N</td><td>77°29' 14.026" E</td></tr> <tr><td>P1</td><td>28°6' 55.886" N</td><td>77°29' 11.661" E</td></tr> <tr><td>P2</td><td>28°6' 59.260" N</td><td>77°29' 10.000" E</td></tr> <tr><td>Q1</td><td>28°7' 2.766" N</td><td>77°29' 9.457" E</td></tr> <tr><td>R1</td><td>28°7' 13.205" N</td><td>77°29' 12.799" E</td></tr> <tr><td>R2</td><td>28°7' 18.063" N</td><td>77°29' 12.912" E</td></tr> <tr><td>S1</td><td>28°7' 22.419" N</td><td>77°29' 12.698" E</td></tr> </tbody> </table>	Point	Latitude	Longitude	Chandhut (South)			A1	28° 7' 22.4796"N	77° 29' 23.399" E	B1	28°7' 15.652" N	77°29' 21.692" E	C1	28°6' 51.324" N	77°29' 38.139" E	D1	28°6' 49.868" N	77°29' 45.677" E	E1	28°6' 46.099" N	77°29' 50.988" E	F1	28°6' 39.589" N	77°29' 55.700" E	G1	28°6' 33.250" N	77°29' 54.415" E	H1	28°6' 25.798" N	77°29' 51.588" E	I1	28°6' 19.887" N	77°29' 46.534" E	J1	28°6' 15.97" N	77°29' 36.67" E	L1	28°6' 22.16" N	77°29' 24.65" E	M1	28°6' 31.708" N	77°29' 29.316" E	N1	28°6' 43.035" N	77°29' 33.998" E	N2	28°6' 45.131" N	77°29' 32.411" E	N3	28°6' 46.154" N	77°29' 24.476" E	O1	28°6' 48.827" N	77°29' 18.139" E	O2	28°6' 52.236" N	77°29' 14.026" E	P1	28°6' 55.886" N	77°29' 11.661" E	P2	28°6' 59.260" N	77°29' 10.000" E	Q1	28°7' 2.766" N	77°29' 9.457" E	R1	28°7' 13.205" N	77°29' 12.799" E	R2	28°7' 18.063" N	77°29' 12.912" E	S1	28°7' 22.419" N	77°29' 12.698" E
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13.	Topography of ML area	Highest elevation in riverbed at extreme north end is 127.25 mRL and bank top level is 130.0 mRL whereas the levels at the extreme south end in riverbed is 124.78 mRL and Riverbank top is 128.17 mRL. The Yamuna River flows from N to S direction in Chandhut revenue village.																																																																											
14.	Mining Method & Technology	Mining activity will be carried out by opencast mechanized 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																																																																											

PROPOSITOR: M/S APEX PROJECT WORKS, HARYANA 45

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 3

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Parameters	Description		
		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. Adequate quantity of sand reserves is available for meeting consumer demand.		
15.	Ultimate depth of Mining	3 m from the riverbed of Yamuna River		
16.	Ground water level	05 - 10 m from the surface level		
17.	GWT intersection	Mining will be done only up to 3 m from surface. So, ground water table will not be intersected.		
18.	Working Days	268 Days		
19.	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.		
20.	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	16.10 KLD
		2	Greenbelt Development	13.70 KLD
		3	Domestic Requirement	7.90 KLD
Total Says		37.70 KLD 38.00 KLD		
21.	Cost of project	The capital cost for the project will be Rs. 17 Crores including proposed lease area and machinery will be hired on contract bases.		

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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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.

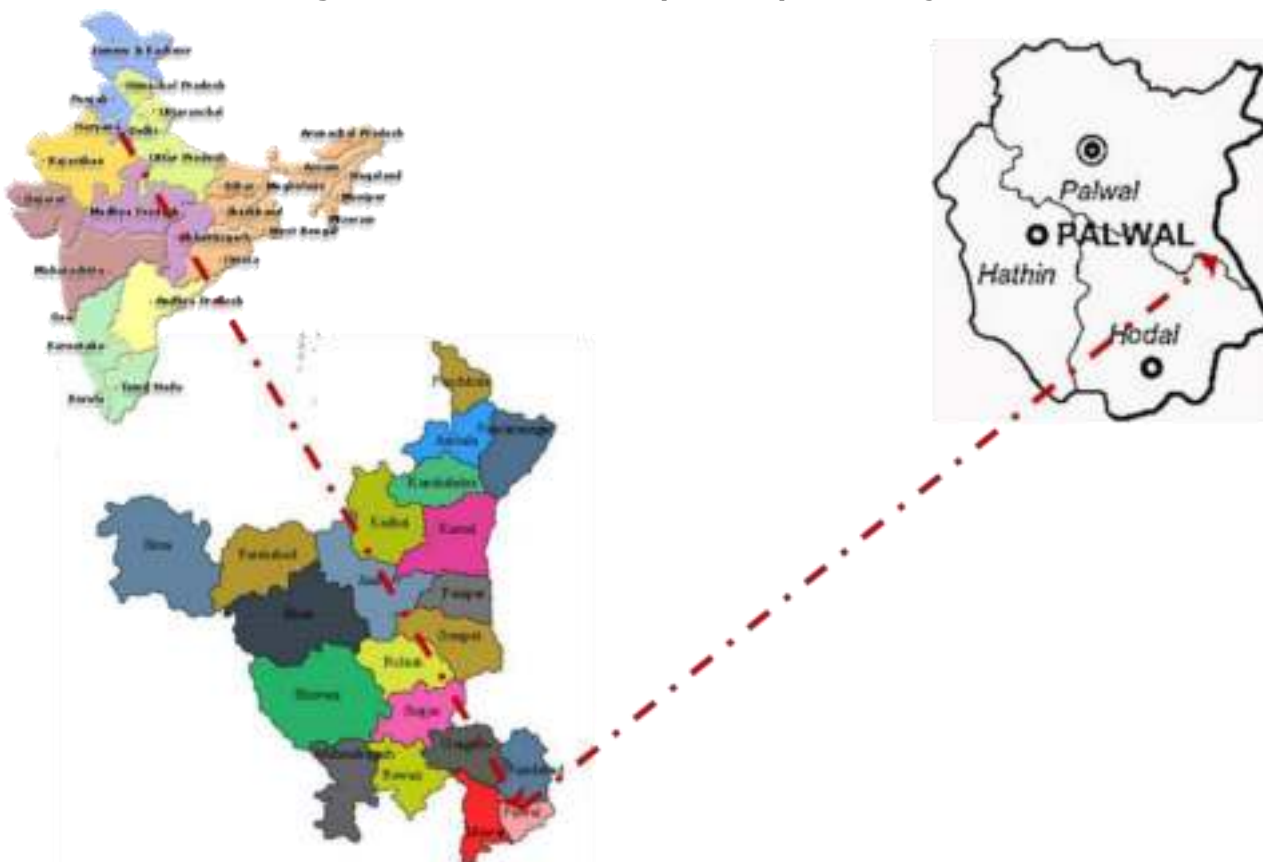
1.2.4. Export Possibility

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

1.3. Location of the Project

The mine lease area is located at village Chandhut South, Tehsil & District Palwal of State Haryana. Lease area is well connected to nearest villages via village road.

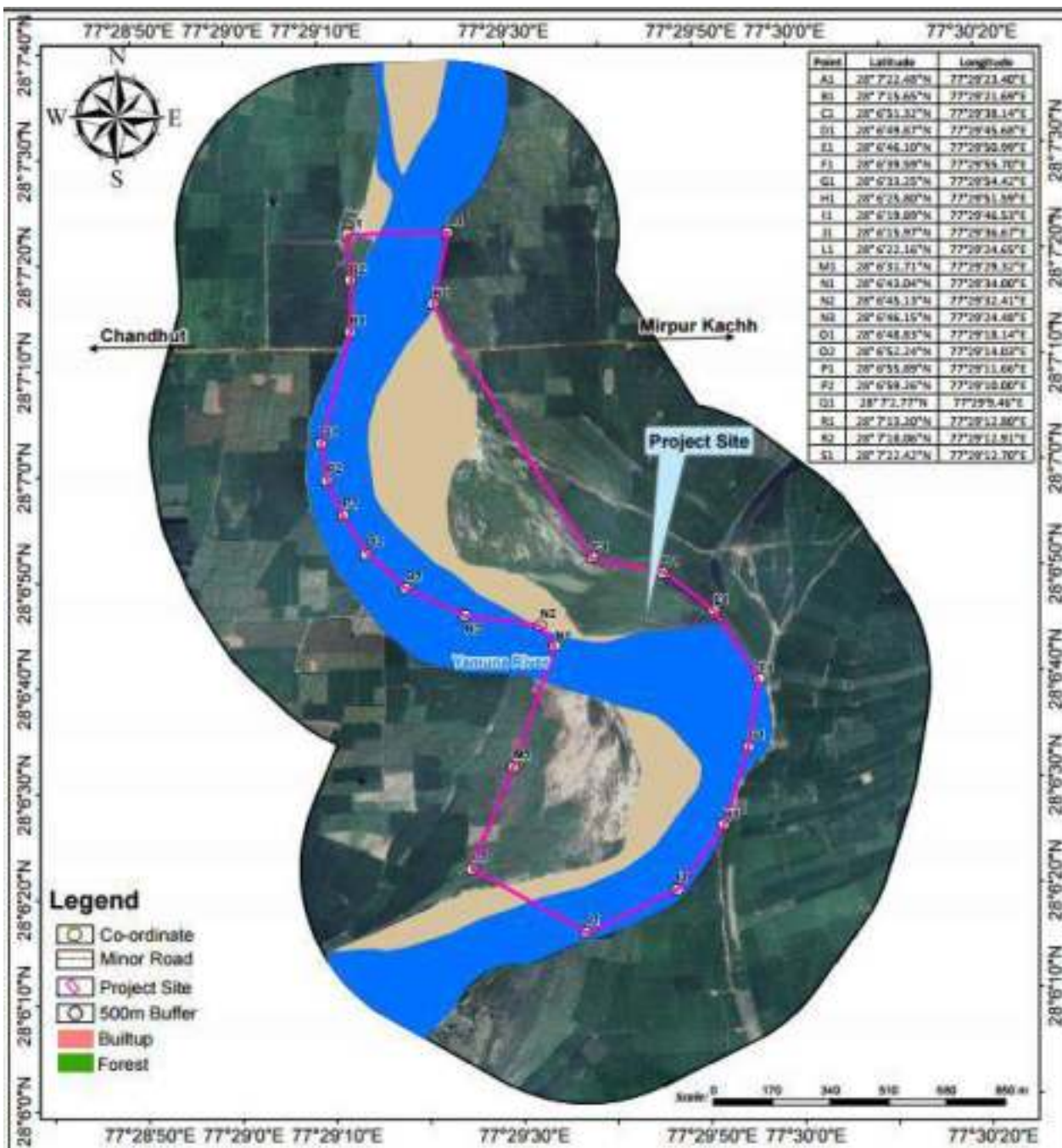
Figure 1.1: Location Map of Proposed Project



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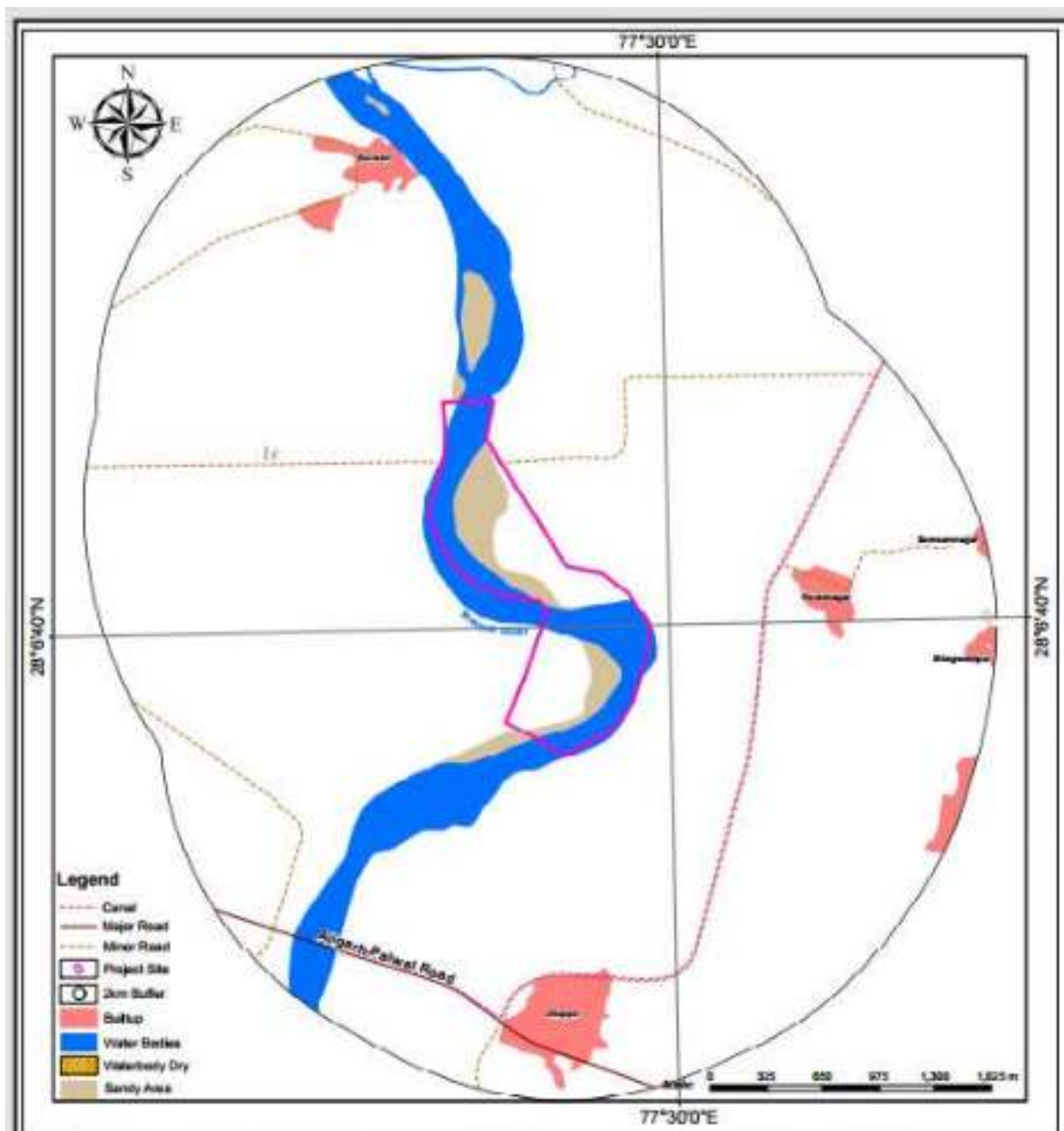
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Figure 1.2: Co-Ordinates Map with 500 m Buffer from Proposed Site



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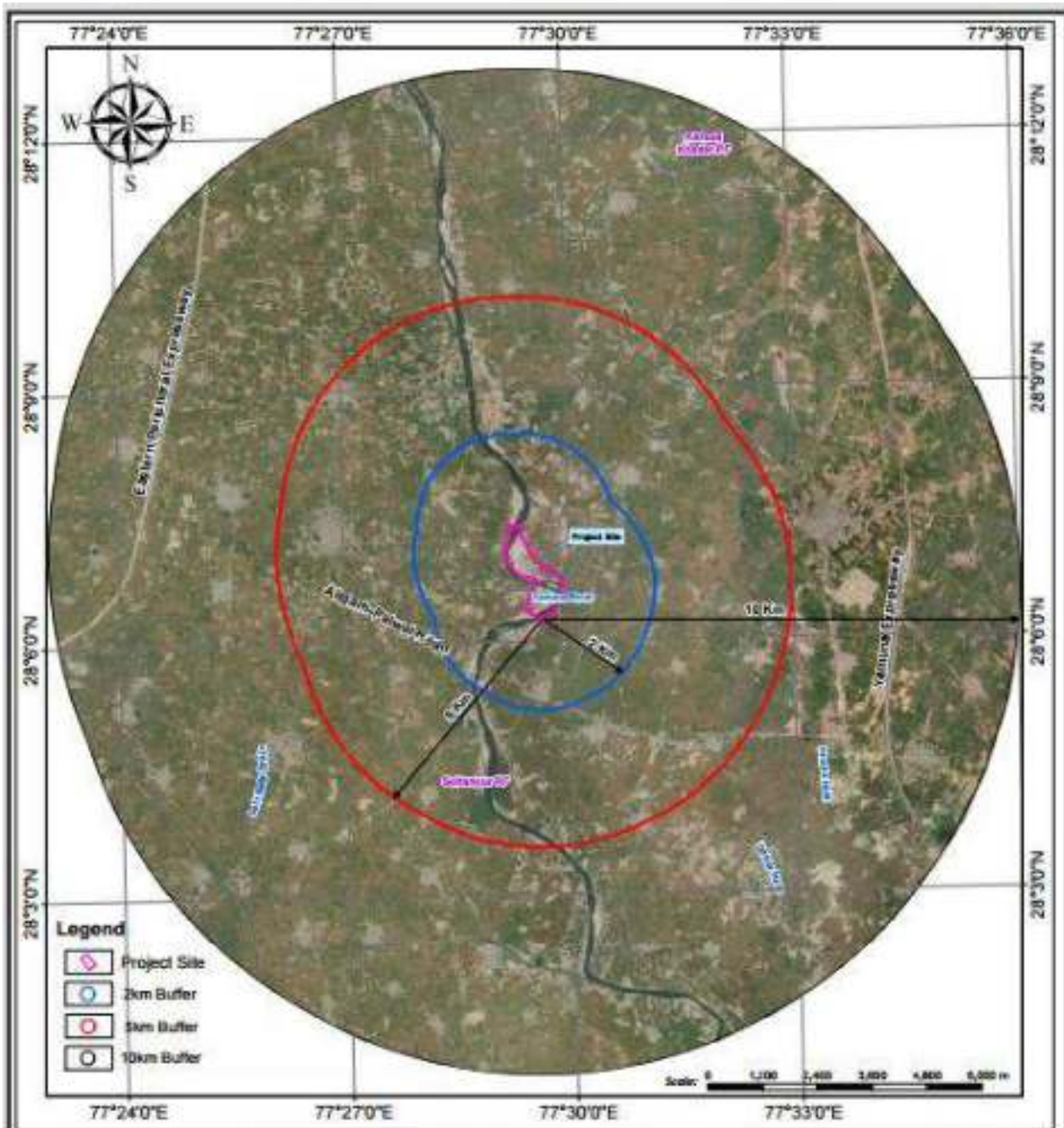
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Figure 1.3: Base Map with 2 km Buffer Showing Site Features

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 23.05.2024 (online) vide proposal no. SIA/HR/MIN/473999/2024 to obtain "Terms of Reference" (ToR). The standard ToR was issued by State Level Environment Impact Assessment Authority, Haryana vide TOR Identification No. **TO24B0107HR5295893N and Single File No. SW/182403/2024, State File No. SEAC/HR/2024/129, Proposal Number SIA/HR/MIN/473999/2024 on dated 12.06.2024** which is enclosed as **Annex 1.6**. We have collected data for one season (pre-monsoon) i.e., from March to May 2024. 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. Project Details	
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 a 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 (LOI) has been issued by the Director Mines & Geology Haryana vide letter no. DMG/HY/Chandhut (South) Unit/Palwal/2023/5727 dated 05.10.2023 for Mining of Sand (Minor Mineral) in Chandhut South Unit, comprising Chandhut South village over an area of 245.39 acres (98.156 hectares) in district Palwal, Haryana for a period of 10 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 Apex Project Works. This is a draft EIA report and will be submitted for public hearing.

PROPONENT: M/S APEX PROJECT WORKS, HARYANA 51

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 9

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
4) PP should submit the District Survey Report (DSR) as per S.O. 3611(E) dated 25.07.2018 in case of minor minerals.	
5) Brief of proposal to be submitted which include total excavation of the material required for the production of certain quantity of the minerals, location of the project, mining lease area, latitude, longitude, seismic zone etc. In case of expansion project details of expansion viz. expansion in mining lease area or expansion in production of any particular mineral or expansion in total excavation, latest certified Compliance Report (CCR) from IRO of conditions granted in existing EC needs to be submitted.	This is a fresh case, and the details of reserves and proposed production is given in Table 1.2 of chapter 1.
6) The PP should submit the real-time aerial video footage & video of the mining lease area and of the transportation route.	The mineral will be transported with a separate road which will not be impacted to the habitation. The route map is enclosed as Figure 4.3 of chapter 4.
7) 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 SOIL toposheet no.- G43F5, G43F9, H43X7, H43X8, H43X11 & H43X12 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.
8) 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 3.1 and digitized land-use of study area is given in figure 3.3 with land-use classification in Table 3.2 of chapter 3.
9) The PP should collect the Baseline data (BLD) in respect of initial level of the mining lease. For this permanent benchmark (BM) needs to be established at prominent location preferably close to mining leases in question and should have precisely known relationship to the level datum of the area, typically mean sea level.	The baseline data has been collected for the season of pre-monsoon season i.e., March to May 2024. Highest elevation in riverbed at extreme north end is 127.25 mRL and bank top level is 130.0 mRL whereas the levels at the extreme south end in riverbed is 124.78 mRL and Riverbank top is 128.17 mRL. The levels of riverbed and riverbank is given in Table 2.1 of chapter 2. The Yamuna River flows from N to S direction in Chandhut revenue village.
10) In case of sand mining, the entire mining lease area should be divided suitably into grids of 25 m x 25 m with the help of sections across the width of river and along the direction of flow of the river. The levels (MSL & RL) of the corner point of each grid needs to be recorded. Each	The baseline data has been collected for the season of pre-monsoon season i.e., March to May 2024. Highest elevation in riverbed at extreme north end is 127.25 mRL and bank top

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
Grid should be suitably numbered for identification. PP should identify grids which will be worked out and grids which will come under no mining zone i.e. safety barriers from the riverbank. PP should comply with the sustainable sand mining management guidelines 2016 and enforcement and monitoring guidelines, 2020 etc.	level is 130.0 mRL whereas the levels at the extreme south end in riverbed is 124.78 mRL and Riverbank top is 128.17 mRL. The levels of riverbed and riverbank is given in Table 2.1 of chapter 2. Mining will be done with the compliance of all guidelines and rules.
11) 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 13,710) 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. The detailed are given in section 10.7 and Table 10.5 of chapter 10.
12) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	The facilities will be provided at ancillary area.
13) 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.	Table 2.1 and Figure 2.8 of chapter 2 are showing the landuse of lease area at the end of proposed mine plan i.e. at conceptual stage. Section 2.6 of chapter 2 is showing the conceptual development plan.
14) 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 project cost is INR 17.0 crores. About INR 18.50 lakhs will be proposed as capital cost and INR 5.80 lakhs as recurring cost under environment management plan. Please refer section 10.10 and Table 10.9 of chapter 10.
15) 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.	Table 8.1 is showing the project benefits to surrounding villagers as well as environment.
16) Compliance of the Ministry's Office Memorandum No. F: 3-50/2017-IA.III (Pt.), dated 30.05.2018 on the judgment of Hon'ble Supreme Court, dated the 2 nd August, 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India needs to be submitted and included in the EIA/EMP Report.	Already compiled.
2. Forest	
1) PP shall submit a certificate from Chief Conservator of Forests regarding involvement of Forest Land in the mining lease area if any. In case forest land is involved i) PP should submit the proof of application made for	No forest land involves in this mine lease as confirmed and issued a certificate by DFO, Palwal on 12.12.2023 with

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
obtaining forest clearance and ii) a map clearly showing the forest & non-forest area.	reference no.3693. The same is enclosed as Annex 1.4.
2) Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	No forest land involves in this mine lease as confirmed and issued a certificate by DFO, Palwal on 12.12.2023 with reference no.3693. The same is enclosed as Annex 1.4.
3) 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.	No forest land involves in this mine lease as confirmed and issued a certificate by DFO, Palwal on 12.12.2023 with reference no.3693. The same is enclosed as Annex 1.4.
4) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	Patches of Sultanpur RF and Karauli Khadar PF are found during the study area. A detailed study on biological environment has been conducted during the monitoring period and the detailed is given in section 3.8 with sub-sections and Tables of chapter 3.
3. Court Matters	
1) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending against the project.
4. Land Environment	
1) PP should submit the details of survey number [viz. survey no, area in hectare, classification of land (government, private, forest, grazing land etc.), villages] duly authenticated by State Government, falling in the mining lease area.	Please refer Table 1.2 of chapter 1 for the Khasra No. and area.
2) The study area will comprise of 10km 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 baseline environment monitoring has been carried out for the season of pre-monsoon i.e., March to May 2024 with comprise of 10 km radius of mine lease boundary. During the mining operation period about 42 kg/day solid waste will be generated.
3) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land-use of the study area is given in Table 3.2, Figure 3.3 of chapter 3. Figure 2.8 and Table 2.12 are showing the land-use of the mine lease area at various stage.
4) 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.	Not applicable as this is a riverbed mine project.
5. Wildlife	

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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Terms of Reference Issued by SEIAA, Haryana	Compliance
<p>1) 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.</p>	<p>As per the faunal survey data, a total of six species were found within the Schedule-I of Indian Wildlife (Protection) Act, 1972 which includes Pavo cristatus (Indian Peafowl), Naja naja (Indian Cobra), Ptyas mucosa (Rat Snake), Varanus benghalensis (Common Indian Monitor lizard), Herpestes edwardsii (Common Mongoose) and Felis chaus (Jungle Cat).</p> <p>We have proposed an amount 34.0 lakhs under wildlife conservation plan which is 2 % of project cost i.e., 2% of 17.0 crores.</p> <p>Conservation plan has been prepared and submitted to the PCCFWL, Haryana for further approval.</p>
<p>2) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.</p>	<p>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- Chandhut South, 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. The detailed study has been incorporated in report in section 3.8 of chapter 3.</p>
<p>3) PP shall submit a certificate from Chief Wildlife Warden regarding distance of mining lease from the protected area falling within 10 KM of the mining lease. In case project requires clearance under Wildlife (Protection) Act, 1972 then copy of application made for the same needs to be submitted.</p>	<p>Not applicable as the mine lease is free from any protected areas.</p>
<p>6. Baseline Environment</p>	
<p>1) 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-</p>	<p>Baseline data as collected in core as well as buffer zone of 10 km from the project boundary during pre-monsoon season (March to May 2024) in accordance with the guidelines for preparation of EIA.</p> <p>✓ A meteorological station was collected hourly for wind speed,</p>

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
<p>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.</p>	<p>wind direction, dry and wet bulb temperature, relative humidity, and general weather conditions were recorded throughout the study period in an automated data logger.</p> <ul style="list-style-type: none"> ✓ To assess the Ambient Air Quality (AAQ), 6 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. ✓ 6 Groundwater samples were collected during the study period from the existing hand-pumps and bore wells, while 5 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. ✓ 6 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 6 locations in different intervals of time with the help of sound level meter to establish the baseline noise levels in the impact zone.
<p>2) 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.</p>	<p>Air quality modelling was done to for the cumulative impact identification. It is observed that the ground level concentration (GLC) decreases from 47.03 $\mu\text{g}/\text{m}^3$ at 50 m from the centre line of the road to 6.14 $\mu\text{g}/\text{m}^3$ at 500 m for proposed mining lease in un-controlled way and 11.76 $\mu\text{g}/\text{m}^3$ at 500 m to 1.54 $\mu\text{g}/\text{m}^3$ at 50 m from the centre line of the road with controlled way respectively.</p>

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
	<p>These values have been predicted for a dry unpaved road. To mitigate the source emission, following mitigation measure will be adopted.</p> <ul style="list-style-type: none"> ✓ 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.
3) The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this, PP should submit the original test reports and certificates of the labs from which samples were analyzed.	Please refer Annex 3.3 of chapter 3 for monitoring photographs.
7. Water Environment	
1) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Submit the year wise target for reduction in consumption of the ground/surface water by developing alternative source of water through rainwater harvesting measures. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. The capital and recurring expenditure to be incurred needs to be submitted.	<p>Water will be required from private tankers for the mining purpose. About 37.7 KLD of water will be required and the detailed is given in section 2.5.5 of chapter 2 and Figure 4.4 of chapter 4 for water balance diagram.</p> <p>Rainwater harvesting is proposed in the panchayat and for this, about INR 4.0 lakhs has been kept for proposed plan period.</p>
2) 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.	Section 4.8, Table 4.16, 4.17, and Figure 4.4 of chapter 4 are showing the impact on water quality.
8. Hydro Geology	
1) 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.
2) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL	Highest elevation in riverbed at extreme north end is 127.25 mRL and bank top

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
and BGL. A schematic diagram may also be provided for the same.	level is 130.0 mRL whereas the levels at the extreme south end in riverbed is 124.78 mRL and Riverbank top is 128.17 mRL. The depth of mining will be 3 m. Mining will be done with the compliance of all guidelines and rules. A schematic diagram is given in chapter 4 as Figure 4.5.
3) 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.	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 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. Mining will be done with the compliance of all guidelines and rules. A schematic diagram is given in chapter 4 as Figure 4.5. 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.
9. Transportation	
1) 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.	During proposed mining, there will be an increase in traffic flow as one location were identified for traffic survey location as one was in NH-334D which connect to Palwal crossing Eastern Peripheral Expressway. Total 1941 PCU/ day will increase in the existing traffic due to this mining activity. After commencement of the project, the projected traffic represents zone of stable flow (LOS Category "B") and represents a zone of stable flow conditions in 2025 which is convenience at all locations. For details, refer section 4.6 of chapter 4.
10. Land Acquisition and R&R	
1) 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	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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
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.	
11. Socio-Economic Environment	
1) 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.	<p>Following health related hazards were identified in open cast mining operations to the workers:</p> <ol style="list-style-type: none"> 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^oC 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 the 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. <p>Occupational health hazard has been identified and risk matrix was developed. For details, refer to section 7.3.7 of chapter 7.</p>
2) 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,	The broad activities proposed under ESR initiative along with financial implications and year wise allocation of funds is shown in Table 10.7 of chapter 10. The

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
quantitative dimensions may be given with time frames for implementation.	<p>salient features of the programme are as follows:</p> <ul style="list-style-type: none"> ✓ 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.
3) 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.	Will be compiled after conducting the public hearing as this is a draft EIA report.
4) Activity-wise time-bound action plan on the issues raised and commitment made during public hearing to be submitted as part of the final EMP Report in compliance of the Ministry's OM F.No.22-65/2017-IA.III dated 30th September 2020.	Will be compiled after conducting the public hearing as this is a draft EIA report.
12. Environment Monitoring and Management	
1) 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 proposed safeguard measures in each case should also be provided.	<p>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:</p> <ul style="list-style-type: none"> ✓ 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
	<ul style="list-style-type: none"> ✓ 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. <p>Apart from this, EMC has been framed in hierarchical system to ensuring the implementation and adaptations of norms and EC conditions.</p>
2) 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.	Please refer chapter 10.
13. Critically Polluted Areas, Aravali & CRZ	
1) 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.
2) 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.
14. Risk Assessment & Disaster Management	
1) 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.	Not applicable as this is a riverbed mining project and there is no provision of underground mining.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
The proposed safeguard measures in each case should also be provided.	
2) 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 mechanised 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.
3) A Disaster Management Plan shall be prepared and included in the EIA/EMP Report.	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. Please refer section 7.4 of chapter 7.
15. Miscellaneous	
1) The 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	Already compiled

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
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.	
2) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The mine lease was allotted by the State Government with LOI reference no. DMG/HY/Chandhut (South) Unit/Palwal/2023/5727 dated 05.10.2023 and the same is enclosed as Annex 1.1. After getting approval from the SEIAA and Pollution Board, the mutual agreement will be made with local land holders than mining activity will be started.
16.	
1) An EIA-EMP Report would be prepared for a combined peak capacity ofMTPA for OC-cum-UG project which consists of MTPA in an ML/project area of ha for OC and MTPA for UG in an ML/project area of ha based on the generic structure specified in Appendix III of the EIA Notification 2006.	The mining activity will be carried out by adopting of opencast mechanised method. There is no provision of underground mining activity as this is a riverbed mine project.
2) An EIA-EMP Report would be prepared for MTPA rated capacity to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modelling for..... MTPA of coal production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.	The EIA/EMP Report has been prepared for the approved capacity of mineral and the EMP has been calculated for the same production of mineral. The mining will be done in full year except monsoon season. The project cost is INR 17.0 crores. About INR 18.50 lakhs will be proposed as capital cost and INR 5.80 lakhs as recurring cost under environment management plan. Please refer section 10.10 and Table 10.9 of chapter 10.
3) The ToRs prescribed for both opencast and underground mining are applicable for opencast – cum-underground mining.	The mining activity will be carried out by adopting of opencast mechanised method. There is no provision of underground mining activity as this is a riverbed mine project.
4) Information on the following aspects of the corporate Environment Responsibility should also be provided for opencast, underground and opencast-cum-underground Min.	The mining activity will be carried out by adopting of opencast mechanised method. There is no provision of underground mining activity as this is a riverbed mine project.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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Terms of Reference Issued by SEIAA, Haryana	Compliance
	About INR 11.0 lakhs has been kept for providing facilities to surrounding villagers of mine lease under Environment Social Responsibilities (ESR) & OHS. Please refer Table 10.7 of chapter 10.
5) Corporate Environment Responsibility:	About INR 11.0 lakhs has been kept for providing facilities to surrounding villagers of mine lease under Environment Social Responsibilities (ESR) & OHS. Please refer Table 10.7 of chapter 10.
6) The Company must have a well laid down Environment Policy approved by the Board of Directors.	Please refer Additional Annex 1 and chapter 6 for company environment policy.
7) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/ conditions.	<p>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:</p> <ul style="list-style-type: none"> ✓ 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.

PROPONENT: M/S APEX PROJECT WORKS, HARYANA 64

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 22

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
	<p>Apart from this, EMC has been framed in hierarchical system to ensuring the implementation and adaptations of norms and EC conditions.</p> <p>Please refer Additional Annex 1 and section 6.3, Table 6.2 of chapter 6 for company environment policy and its provisions.</p>
<p>8) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.</p>	<p>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:</p> <ul style="list-style-type: none"> ✓ 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. <p>Apart from this, EMC has been framed in hierarchical system to ensuring the implementation and adaptations of norms and EC conditions.</p>
<p>9) To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the</p>	<p>Please refer section 6.4 of chapter 5 for reporting system.</p>

PROPONENT: M/S APEX PROJECT WORKS, HARYANA 65

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 23

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
Board of Directors of the company and/or shareholders or stakeholders at large.	
10) The condition prescribed in standard ToR separately for opencast and underground mine to also be followed and also of coal washery if located within lease area or near to the mine lease area.	Not applicable as this is a riverbed mine project.
11) An EIA-EMP Report shall be prepared for..... MTPA peak capacity in an ML/project area of....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.	The mining activity will be carried out by adopting of opencast mechanised method. There is no provision of underground mining activity as this is a riverbed mine project.
12) An EIA-EMP Report would be prepared for MTPA rated capacity to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modelling for..... MTPA of coal production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.	The EIA/EMP Report has been prepared for the approved capacity of mineral and the EMP has been calculated for the same production of mineral. The mining will be done in full year except monsoon season. The project cost is INR 17.0 crores. About INR 18.50 lakhs will be proposed as capital cost and INR 5.80 lakhs as recurring cost under environment management plan. Please refer section 10.10 and Table 10.9 of chapter 10.
13) If the washery is located within the mine lease or near to the mine lease its location should be cited separately also, providing pillar coordinates and site layout plan. In such cases cumulative impact of mine operation with washery to be assessed and EMP measure to be drawn to the worst scenario.	Not applicable as this is a riverbed mine project.
14) Plan of mechanized transportation of coal-to-coal washery also for rejects and washed coal to be drawn.	Not applicable as this is a riverbed mine project.
15) Proper KML file with pin drop and coordinate of mine at 500-1000 m interval be provided.	Compiled
16) A toposheet specifying locations of the State, District and Project site should be provided.	Please refer Figure 1.1 of chapter 1.
17) A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines, washery and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also.	Please refer Figure 3.1 of chapter 3.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
18) Land use map (1: 50,000 scale) based on a recent satellite imagery of the study area may also be provided with explanatory note on the land use.	Figure 3.3 and Table 3.2 of chapter 3 are showing the land-use classification of the study area of the project.
19) Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.	Table 3.3 and Figure 3.5 of chapter 3 are showing the landuse classification of core area of mine lease.
20) A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.	A contour map of the study area is enclosed as AA 2. A drainage map of the study area is also enclosed as Figure 2.2 of chapter 2.
21) A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, CHP, ETP, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.	Please refer Table 2.12 of chapter 2.
22) In case of any proposed diversion of nallah/canal/river, the proposed route of diversion/modification of drainage and their realignment, construction of embankment etc. should also be shown on the map as per the approval of Irrigation and flood control Department of the concerned state.	There is no provision of any diversion of stream or river in this proposal.
23) Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need elaboration in form of lengthe, quantity and quality of water to be diverted.	A drainage map of the study area is enclosed as Figure 2.2 of chapter 2.
24) Prior in principle approval from the respective state govt shall be required in cases where PP proposes diversion of river/ stream/ nallah/ drains. However, state approval shall not be finally considered before the appraisal by EAC. PP shall have submitted detailed project report in case where diversion is required with emphasis on hydrological study.	There is no provision of any diversion of stream or river in this proposal.
25) Similarly, if the project involves diversion of any road/railway line passing through the ML/project area, the proposed route of diversion and its realignment	There is no provision of any diversion of road/railway in this proposal.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance																																													
should be shown in the map along with the status of the approval of the competent authority.																																														
<p>26) Break up of lease/project area as per different land uses and their stage of acquisition should be provided. LANDUSE DETAILS FOR OPENCAST PROJECT should be given as per the following table:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Sl. No.</th> <th style="text-align: center;">Landuse</th> <th style="text-align: center;">Within ML area/project area (ha)</th> <th style="text-align: center;">Outside ML area/project area (ha)</th> <th style="text-align: center;">Total</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Agricultural land</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Forest land</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>Wasteland</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Grazing land</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>Surface water bodies</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">6</td> <td>Settlements</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">7</td> <td>Others (specify)</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">Total</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Sl. No.	Landuse	Within ML area/project area (ha)	Outside ML area/project area (ha)	Total	1	Agricultural land				2	Forest land				3	Wasteland				4	Grazing land				5	Surface water bodies				6	Settlements				7	Others (specify)				Total					Please refer Table 2.12 of chapter 2.
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27) Break-up of lease/project area as per mining plan should be provided.	Please refer Table 2.12 of chapter 2 for landuse breakup of the lease area.																																													
28) Impact of changes in the land use due to the project if the land is predominantly agricultural land/forestland/grazing land, should be provided.	Please refer Annex 1.3 for approved mine plan.																																													
<p>29) Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.</p>	<p>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- Chandhut South, 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. The detailed study has been incorporated in report in section 3.8 of chapter 3.</p> <p>As per the faunal survey data, a total of six species were found within the Schedule-I of Indian Wildlife (Protection) Act, 1972 which includes Pavo cristatus (Indian Peafowl), Naja naja (Indian Cobra), Ptyas mucosa (Rat Snake), Varanus benghalensis (Common Indian Monitor lizard), Herpestes edwardsii (Common Mongoose) and Felis chaus (Jungle Cat).</p> <p>We have proposed an amount 34.0 lakhs under wildlife conservation plan which is</p>																																													

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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Terms of Reference Issued by SEIAA, Haryana	Compliance
	<p>2 % of project cost i.e., 2% of 17.0 crores.</p> <p>Conservation plan has been prepared and submitted to the PCCFWL, Haryana for further approval.</p>
<p>30) One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SO_x, NO_x and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/MoEF&CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.</p>	<p>A baseline environment monitoring has been done for one season i.e./ March to May 2024 and the monitoring has been done by the NABL approved lab namely Asia Enviro Lab and the same is enclosed as Annex 12.2.</p>
<p>31) Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.</p>	<p>Please refer chapter 3 with sections and figures.</p>
<p>32) For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided</p>	<p>A baseline environment monitoring has been done for one season i.e./ March to May 2024 and the monitoring has been done by the NABL approved lab namely Asia Enviro Lab and the same is enclosed as Annex 12.2.</p> <p>For Air Quality Monitoring, please refer section 3.6 of chapter 3.</p>
<p>33) A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.</p>	<p>During proposed mining, there will be an increase in traffic flow as one location were identified for traffic survey location as one was in NH-334D which connect to Palwal crossing Eastern Peripheral Expressway. Total 1941 PCU/ day will increase in the existing traffic due to this mining activity. After commencement of the project, the projected traffic represents zone of stable flow (LOS Category "B") and represents a zone of stable flow conditions in 2025 which is</p>

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
	convenience at all locations. For details, refer section 4.6 of chapter 4.
34) The socio-economic study to be conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mentioned. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.	Please refer section 3.9 with sub-sections and Tables of chapter 3
35) The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.	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- Chandhut South, 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. The detailed study has been incorporated in report in section 3.8 of chapter 3.
36) Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted.	Please refer section 4.10, Figure 4.5 and Table 4.19 of chapter 4.
37) Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.	Please refer Table 1.2 of chapter 1.
38) Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology	Mining activity will be carried out by opencast mechanised method.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
and equipment proposed to be used vis-à-vis the potential impacts should be provided.	Please refer chapter 2.
39) Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing through the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.	There is no provision for diversion in any rivers flow or nallas. Please refer section 4.10, Figure 4.5 and Table 4.19 of chapter 4.
40) Forest diversion shall be only proposed for coal bearing areas. No non-essential infrastructure, office, workshop etc shall be proposed or developed in forest area. No forest area shall be used for OB dump, accordingly Mine plan to be prepared.	Not applicable as the proposed mine lease is free from any forest land. In this regard, DFO, Palwal is confirm via NOC and the same is enclosed as Annex 1.4.
41) Detail of OB recovery for reutilization of minerals from mining shall be explored.	Not applicable as this is a riverbed mine project and no provision for OB.
42) OB dump management from its extraction, transportation to reutilization, disposal / backfilling, to be carry on in a manner to minimize its impact. A detail to be furnished in EIA/EMP report.	Not applicable as this is a riverbed mine project and no provision for OB.
43) Detailed water balance should be provided. The break-up of water requirement for the various mine operations should be given separately.	Please refer Table 4.17, and Figure 4.4 of chapter 4.
44) Flow chart of water balance should be provided. Treatment of effluents from workshop, township, domestic wastewater, mine water discharge, etc. should be provided. Details of STP in colony and ETP in mine should be given. Recycling of water to the max. possible extent should be done.	Please refer Table 4.17, and Figure 4.4 of chapter 4.
45) PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs.	Please refer chapter 10.
46) PP shall propose and explore to use LNG/CNG based mining machineries and trucks for mining operation and transportation of coal. The measures adopted to conserve energy or use of renewable sources shall be submitted.	This is a riverbed mine project and the trucks/dumpers for transportation of mineral shall be used of CNG/Diesel as fuel or availability.
47) PP to evaluate the greenhouse emission gases from the mine operation/ washery plant and corresponding carbon absorption plan.	Not applicable as this is a riverbed mine project.
48) Site specific impact assessment with its respective measure to be provided.	Please refer chapter 4.
49) Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.	There is no provision of water abstraction from the river. Water will be met from private tankers. Please refer section 4.10, Figure 4.5 and Table 4.19 of chapter 4.
50) Impact of blasting, noise and vibrations should be given.	Not applicable as this is a riverbed mine project.

PROPOSANT: M/S APEX PROJECT WORKS, HARYANA 71

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 29

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
<p>51) Impacts of mining on the AAQ and predictions based on modeling using the ISCST-3 (Revised) or latest model should be provided.</p>	<p>Air quality modelling was done to for the cumulative impact identification. It is observed that the ground level concentration (GLC) decreases from 47.03 $\mu\text{g}/\text{m}^3$ at 50 m from the centre line of the road to 6.14 $\mu\text{g}/\text{m}^3$ at 500 m for proposed mining lease in un-controlled way and 11.76 $\mu\text{g}/\text{m}^3$ at 500 m to 1.54 $\mu\text{g}/\text{m}^3$ at 50 m from the centre line of the road with controlled way respectively. These values have been predicted for a dry unpaved road. To mitigate the source emission, following mitigation measure will be adopted.</p> <ul style="list-style-type: none"> ✓ 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. <p>Plantation of trees along roads sides to help reduce the impact of dust in the nearby villages.</p>
<p>52) Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.</p>	<p>Air quality modelling was done to for the cumulative impact identification. It is observed that the ground level concentration (GLC) decreases from 47.03 $\mu\text{g}/\text{m}^3$ at 50 m from the centre line of the road to 6.14 $\mu\text{g}/\text{m}^3$ at 500 m for proposed mining lease in un-controlled way and 11.76 $\mu\text{g}/\text{m}^3$ at 500 m to 1.54 $\mu\text{g}/\text{m}^3$ at 50 m from the centre line of the road with controlled way respectively. These values have been predicted for a dry unpaved road. To mitigate the source emission, following mitigation measure will be adopted.</p> <ul style="list-style-type: none"> ✓ 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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
	<p>vehicles with tarpaulin and sprinkling of water, if dry.</p> <ul style="list-style-type: none"> ✓ 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. <p>Plantation of trees along roads sides to help reduce the impact of dust in the nearby villages.</p>
53) Effort be made to reduce/eliminate road transport of coal inside and outside mine and for mechanized loading of coal through CHP/ Silo into wagons and trucks/tippers.	Not applicable as this is a riverbed mine project.
54) Details of waste OB and topsoil generated as per the approved calendar programme, and their management shown in figures as well explanatory notes tables giving progressive development and mine closure plan, green belt development, backfilling programme and conceptual post mining land use should be given. OB dump heights and terracing based on slope stability studies with a max of 28o angle as the ultimate slope should be given. Sections of final dumps (both longitudinal and cross section) with relation to the adjacent area should be shown.	Not applicable as this is a riverbed mine project.
55) Efforts be made for maximising progressive internal dumping of O.B., sequential mining, external dump on coal bearing area and later rehandling into the mine void.--to reduce land degradation.	Not applicable as this is a riverbed mine project.
56) Impact of change in land use due to mining operations and plan for restoration of the mined area to its original land use should be provided.	There will be no impact on the river as mining will be done in dry area of river not in mainstream.
57) Progressive Green belt and ecological restoration /afforestation plan (both in text, figures and in the Adequate greenbelt nearby areas, coal stock yard and transportation area of coal shall be provided with details of species selected and survival rate. Adequate greenbelt nearby areas, coal stock yard and transportation area of coal shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route and CHP. Table 2 : Stage Wise Cumulative Plantation	Please refer section 10.7, Table 10.5 of chapter 10.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
<p>H341</p> <p>S.N. Land use Category Present 5th 10th 20th 24th Year (1st Year) Year Year Year (end of mine life)*</p> <ol style="list-style-type: none"> 1 Backfilled Area(Reclaimed with plantation) 2 Excavated Area (not reclaimed)/void 3 External Oil dump Reclaimed with plantation 4 Reclaimed Top soil dump 5 Green Built Area 6 Undisturbed area (brought under plantation) 7 Roads (greenie plantation) 8 Area around buildings and Infrastructure <p>Total</p> <p>S. No. YEAR*</p> <ol style="list-style-type: none"> 1 1st year 2 2nd year 3 3rd year 4 10th year 5 15th year 6 20th year 7 25th year 8 30th year 9 34th year(end of mine life) 10 34- 37th Year (Post-mining) <p style="text-align: center;">Grand External Backfilled- Belt Dump Area Others(Undisturbed Area/etc)) TOTAL</p>	
<p>58) Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre-mining status should be provided. A Plan for the ecological restoration of the mined-out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished. Table 3: Post-Mining Landuse Pattern of ML/Project Area (ha).</p> <p>S.N. Land use during Mining Land Use (ha) Plantation Water Body Public Use Undisturbed Total</p> <ol style="list-style-type: none"> 1 External Oil Dump 2 Top soil Dump 3 Excavation 4 Roads 5 Built up area 6 Green Belt 7 Undisturbed Area <p>Total</p>	<p>Please refer section 2.6, Figure 2.8, and Table 2.12 of chapter 2.</p>
<p>59) Occupational health issues. Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower in the mine should be given.</p>	<p>Table 10.7 of chapter 10 is showing the proposed provision for the project under ESR and OHS.</p>
<p>60) Site specific Risk Assessment and Disaster Preparedness and Management Plan should be provided.</p>	<p>Please refer chapter 7.</p>
<p>61) (i)Integration of the Env. Management Plan with measures for minimizing use of natural resources - water, land, energy, etc. should be carried out.</p>	<p>Please refer chapter 10.</p>
<p>62) Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.</p>	<p>The detailed activity-wise has been calculated which are INR 18.50 Lakhs as a Capital Cost and INR 5.80 Lakhs per annum as a Recurring cost, respectively. Total budget of INR 47.50 Lakhs for</p>

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
	environmental measurements has been ensured by the developer for plan period. Please refer section 10.10 and Table 10.9 of chapter 10.
63) Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.	The mine lease was allotted by the State Government with LOI reference no. DMG/HY/Chandhut (South) Unit/Palwal/2023/5727 dated 05.10.2023 and the same is enclosed as Annex 1.1. After getting approval from the SEIAA and Pollution Board, the mutual agreement will be made with local land holders than mining activity will be started. So, no R&R involved in this project.
64) CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.	Table 10.7 of chapter 10 is showing the proposed provision for the project under ESR and OHS.
65) a) The Company must have a well laid down Environment Policy approved by the Board of Directors.	Please refer Additional Annexure 1.
66) b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.	Please refer Additional Annexure 1.
67) c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.	Please refer reply of point no. 8 of this section.
68) d) To have proper checks and balances, the company should have a well laid down 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.	Please refer reply of point no. 9 of this section.
69) f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.	Compiled
70) Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.	NA as this is a draft EIA report and submitting to pollution board for conducting the public hearing. After public hearing, the same is incorporated in Final EIA report.
71) Status of any litigations/ court cases filed/pending on the project should be provided.	NA
72) Submission of sample test analysis of Characteristics of coal: This should include details on grade of coal and other characteristics such as ash content, S and heavy metals including levels of Hg, As, Pb, Cr etc.	As this is a riverbed mine project. Please refer chapter 3 and test report will be submitted with Final EIA report.

PROPOSER: M/S APEX PROJECT WORKS, HARYANA 75

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 33

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance					
73) Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.	Already compiled					
74) FOREST CLEARANCE: Details on the Forest Clearance should be given as per the format given: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: center;">TOTAL ML/PROJECT AREA (ha)</td> <td style="width: 15%; text-align: center;">TOTAL FORESTL. AREA (ha)</td> <td style="width: 30%; text-align: center;">AND Date of FC If more than, provide details of each FC</td> <td style="width: 40%; text-align: center;">Balance area for which FC is yet to be obtained</td> <td style="width: 10%; text-align: center;">Status of appl. for diversion of forest land</td> </tr> </table>	TOTAL ML/PROJECT AREA (ha)	TOTAL FORESTL. AREA (ha)	AND Date of FC If more than, provide details of each FC	Balance area for which FC is yet to be obtained	Status of appl. for diversion of forest land	NA as the lease area is a riverbed and the NOC from DFO, Palwal was given and confirmed the same that there is no land of forest department. Please refer Annex 1.4.
TOTAL ML/PROJECT AREA (ha)	TOTAL FORESTL. AREA (ha)	AND Date of FC If more than, provide details of each FC	Balance area for which FC is yet to be obtained	Status of appl. for diversion of forest land		
75) PP shall submit clarification from PCCF that mine does not fall under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.	Please refer reply of point no. 29 of this section.					
76) Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users in the upstream and downstream of the project site. should be given.	Water will be met from private tankers.					
77) In case of expansion of the proposal, the status of the work done/activities as per mining plan and mine closure plan and progressive reclamation of OB dump shall be detailed in EIA/ EMP report.	NA as this is a fresh case for environment clearance.					
78) A copy of application submitted for 5-star rating system to Ministry of coal for expansion cases may be provided. Certificate /rating given to project shall be provided with EIA-EMP report.	NA as this is a riverbed mine project.					
79) PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes.	Will be compiled in final report.					
80) Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.	NA this a fresh case/lease for environment clearance. Please refer Annex 1.1 of chapter 1.					
81) The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification).	Compiled					
82) The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter,s section.	Compiled					
83) An EIA-EMP Report shall be prepared for peak capacity (.....MTPA)operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.	Please refer reply of point no. 1 of this section.					

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
84) An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for.... MTPA of coal production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.	Please refer reply of point no. 2 of this section.
85) A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines, coal washery and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also.	Please refer reply of point no. 17 of this section.
86) (Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.	Please refer reply of point no. 37 of this section.
87) Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights.	Please refer Table 3.3 and Figure 3.5 of chapter 3.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
88) One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.	Please refer reply of point no. 30 of this section.
89) Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.	Manpower for the project will be needed from the nearby villages. The provision of the employment and provision to their benefits is given in Table 10.7 of chapter 10.
90) Study on land subsidence including modelling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.	Please refer reply of point no. 52 of this section.
91) Detailed water balance should be provided. The break-up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.	Please refer reply of point no. 43 of this section.
92) PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of coal. The measures adopted to conserve energy or use of renewable sources shall be explored.	Please refer reply of point no. 46 of this section.
93) PP shall explore the use of vent gases as generated from underground Mine for use of energy generation/in house energy consumption.	NA as this is a riverbed mine project.
94) Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.	Please refer reply of point no. 7 of this section.
95) Impact of stowing by using coal washery rejects/ fly ash/ bottom ash shall be assessed in term of leachate generation and its characteristic.	NA as this is a riverbed mine project.
96) Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, coal handling & storage/stockyard, etc,	Please refer reply of point no. 39 of this section.

PROPONENT: M/S APEX PROJECT WORKS, HARYANA 78

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 36

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
Impact of blasting, noise and vibrations should be provided.	
97) Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.	All the facilities to labors will be provided at ancillary area which is also the part of this project.
98) The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.	All the machinery or water tankers will be on hired basis. Please refer section 2.5.4, Table 2.9, and 2.10 of chapter 2.
99) Impacts of CHP, if any on air and water quality should be given. A flow chart showing water balance along with the details of zero discharge should be provided.	Please refer reply of point no. 43 of this section.
100) Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre-mining status should be provided. A Plan for the ecological restoration of the mined-out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.	Please refer reply of point no. 58 of this section.
101) Adequate greenbelt nearby areas, coal stock yard and transportation area of coal shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route and CHP.	NA as this s a riverbed mine project.
102) e) Environment Management Cell and its responsibilities to be clearly spleel out in EIA/ EMP report.	Please refer chapter 6.
103) Details on the Forest Clearance should be given as per the format given: <div style="font-size: small; margin-left: 20px;"> <p>Total ML Total Project Area Forest (ha) land (ha) Date of Exent. of Balance area for which Status of appl. For FC Forest Land FC is yet to be obtained diversion of forest land If more than one provide details of each FC</p> </div>	NA as the lease area is a riverbed and the NOC from DFO, Palwal was given and confirmed the same that there is no land of forest department. Please refer Annex 1.4.
Additional Terms of Reference	
1) The PP shall submit the latest approved mining plan and closure plan.	Enclosed as Annex 1.3.
2) The PP shall submit the latest approved DSR from the Mining Department.	Enclosed as Annex 1.5.
3) The PP shall submit the fresh scientific/drone-based replenishment study approved by the Competent Authority.	As the replenishment study is the part of mining plan and the same is detailed in mine plan. Also we are requested to mining department for issuing of separate approval letter for replenishment study.
4) The PP shall submit an affidavit to the effect that all the Khasra Numbers and Latitudes/Longitudes mentioned in the EIA report are correct.	Please refer AA 3.

PROPONENT: M/S APEX PROJECT WORKS, HARYANA 79

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 37

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
5) The PP shall submit the green plan details.	Please refer section 10.7, table 10.5 of chapter 10.
6) The PP shall submit the copy of LOI.	
7) The Proponent should collect the baseline data in respect of initial level of the mining lease. For this permanent benchmark (BM) needs to be established at prominent location preferably close to mining leases in question and should have precisely known relationship to the level datum of the area, typically mean sea level. The entire mining lease should be divided suitably in the grids of 25 Meter x 25 Meters with the help of sections across the width of river and along the direction of flow of the river. The levels (MSL & RL) of the corner point of each grid need to be recorded. Each Grid should be suitably numbered for identification. PP should identify grids which will be worked out and grids which will come under no mining zone i.e. safety barriers from the riverbank, safety barrier at lease boundary, restrictions as per condition of Lol/Mining Lease deed, restriction as Mineral Concession Rule of the Haryana State, restrictions as per sustainable sand mining management guidelines 2016, restriction as per DSR etc. The PP should ascertain the level of the riverbed with the help of sections drawn across the width of the rivers and along the direction of flow of the river and based on this define the depth of mining of each grid. The PP should provide in tabular format the details of the grid viz. wise material availability, dimension of grid, location of grid (latitude, longitude, MSL and level from outside ground level of the corner points), average level of grid (AMSL and RL), depth of mining in each grid, area, volume, grids under mining zone and those left under no mining zone etc. The PP should submit surveyed data so collected in the excel or CSV file so that the same can be readily used for verification in CAD or Data mine Software. In addition to this soft & hard copy of all the plan & section needs to be submitted.	As this is a riverbed mine project and no provision of permanent benchmark is establish.
8) PP should suitably name each section line. Section Plan for both sections drawn across the river and along the direction of the river needs to be submitted. Each Section should have level on vertical axis and distance from the bank of river on horizontal axis. For the section along the direction of the river the levels to be shown on vertical axis and distance from upstream to downstream should be shown on horizontal axis.	Surface Geological plan with section is enclosed as Figure 2.6 of chapter 2.
9) The PP should prepare the Mining Plan based on the above survey. The information sought above needs to be a part of the mining plan. In the mining plan year wise production plan should be prepared in three plates for each year. Plat-1 show the mine working for the pre-	Enclosed as Annex 1.3.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
monsoon period (1st APR- 30th June), Plate- 2 should for the period (1st July-15th Sep) as the mining lease area needs to be left for the replenishment of the riverbed mineral and no mining should be proposed in this period and plat-3 show the mine working after replenishment of the river bed i.e. post monsoon period (16th Sep-31st March). The period of monsoon may also be defined in consultation with State Government.	
10) PP should specifically mention in the mining plan that in the subsequent scheme of mining/review of mining plan, the year wise data pertaining to replenishment study (all five years) shall be provided which include the level (AMSL & RL) of riverbed recorded before and after the monsoon, year wise replenishment quantity, all plan & sections of the replenishment study for the past five years.	Enclosed as Annex 1.3.
11) PP should submit an undertaking by way of affidavit as required as per Ministry's O.M No 3- 50/2017 - 1A. IM) dated 30.05.2018 to comply with all the statutory requirements and judgment of Hon'ble Supreme Court dated the 2 nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors.	Enclosed as AA 4
12) PP should include in EIA Report details of all the statutory clearances, permissions, no objection certificates, consents etc. required for this project under various Acts, Rules and regulations and their status or estimated timeline after grant of EC.	Agreed
13) The PP should submit the revenue plan, revenue plan superimposed on the satellite imaginary clearly demarcate the Govt. land, private land, agricultural land.	Already given in mining plan as Plate 1.
14) The PP should clearly bring out the protective and mitigative measures to be taken for the nearby habitation and religious structures in line with the Ministry's O.M. No. Z- 11013/57/2014- IA. II (M) dated 29.10.2014.	Agreed
15) The PP should submit the detailed plan in tabular format (year-wise for life of mine) for afforestation and green belt development in and around the mining lease. The PP should submit the number of saplings to be planted, area to be covered under afforestation & green belt, location of plantation, target for survival rate and budget earmarked for the afforestation & green belt development. In addition to this PP should show on a surface plan (5 year interval for life of mine) of suitable scale the area to be covered under afforestation & green belt clearly mentioning the latitude and longitude of the area to be covered during each 5 years.	Please refer section 10.7, table 10.5 of chapter 10.
16) PP should submit the measures to be adopted for prevention of illegal mining and pilferage of mineral.	Mining activity will be done by opencast mechanised method.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Terms of Reference Issued by SEIAA, Haryana	Compliance
17) The PP shall carry out the study of Ecological effect of particulate matter on the flora and fauna.	Already covered in impact assessment and mentioned in chapter 4.
18) The PP shall submit the undertaking that mining will be carried out in accordance with all other provisions as applicable under the Mines Act, 1952, Mines and Minerals (Development and Regulation) Act, 1957, Forest (Conservation) Act, 1980 and Environment (Protection Act), 1986 and the rules made there under, wild life (Protection) Act 1972, water (Prevention and control of pollution) Act 1974 and Air (Prevention and Control of Pollution) Act, 1981.	Please refer AA 5.
19) The PP should submit an affidavit that no JCB will be used for mining and only semi-mechanized mining will be carried out.	Please refer AA 6.
20) The PP shall submit that no illegal mining has taken place in the mining lease area and no illegal mining will be allowed during operation of mine.	Mining activity will be done by opencast mechanised method.
21) The PP shall get the EIA study conducted by accredited agency for the use of large number of trucks/tippers including the impact of load and frequency of large number of machineries in the mining lease area.	The EIA report has been prepared by the accredited consultant of Parivesh Environmental Engineering Services, Lucknow. The certificate is enclosed as Annex 12.1.

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 pre-monsoon season (March to May 2024) to determine the existing conditions of various environmental attributes as outlined in **Table 1.4**.

Table 1-4: Environmental Attributes and Frequency of Monitoring

Attributes	Parameters	Frequency
Ambient Air Quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x & CO	Twice a week for one season as per CPCB guidelines at 6 locations.
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.

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Attributes	Parameters	Frequency
Water quality	Physical, Chemical and Bacteriological parameters	Once in a season (Surface Water at 5 & Ground Water 6 Locations)
Ecology	Existing terrestrial and aquatic flora and fauna within 10km radius circle.	Primary Inventorization and Secondary data was collected from the forest department.
Noise levels	Noise levels in dB(A)	Once in a season (24 hours) at 6 locations.
Soil Characteristics	Physico-chemical soil quality	Once during study period at 06 locations.
Land use	Land use classification for different categories	Based on Toposheets (SOI) and Satellite imagery.
Socio-economic Pattern	Demographic and Working Status	Based on Census of India, 2011 and primary consultation.
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.
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

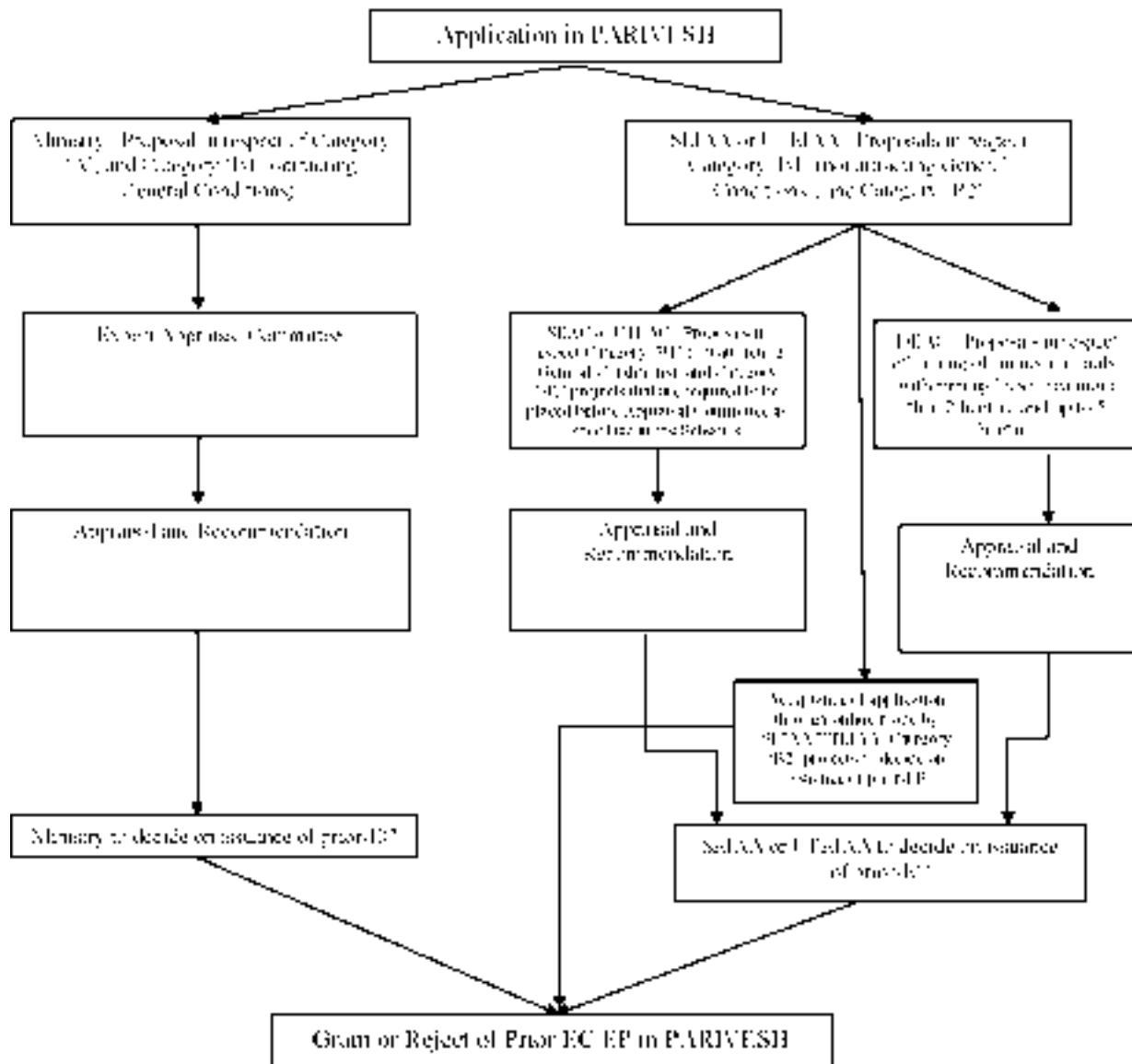
Environmental clearance of any new project or expansion of existing projects is now done as per the notification of the Ministry of Environment and Forest & Climate Change (MoEF&CC), Govt. of India dated 14th September 2006 and subsequently amended. This notification requires prior environmental clearance 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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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.

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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 and Transboundary Movement) Amendment Rules, 2023	To the adequate handling of hazardous materials or wastes.	Central Government, Nodal Agencies MoEF&CC, CPCB
Solid Waste Management Rules 2016 & Plastic Waste Management (Amendment) Rules, 2022	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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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.

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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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. 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 Apex Project Works proposed a mining project for mineral sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 Metric Tonne/ year production over an area of 98.156 ha (245.39 acres) located at Villages Chandhut (South), Tehsil & District Palwal and State Haryana. This is a fresh lease.

2.3. Mine Details

2.3.1. Topography & Drainage

Highest elevation in riverbed at extreme north end is 127.25 mRL and bank top level is 130.00 mRL whereas the levels at the extreme south end in riverbed is 124.78 mRL and Riverbank top is 128.17 mRL. The Yamuna River flows from N to S direction in Chandhut South revenue village. Difference between highest and lowest elevation of both pits is approx. 2-3 m.

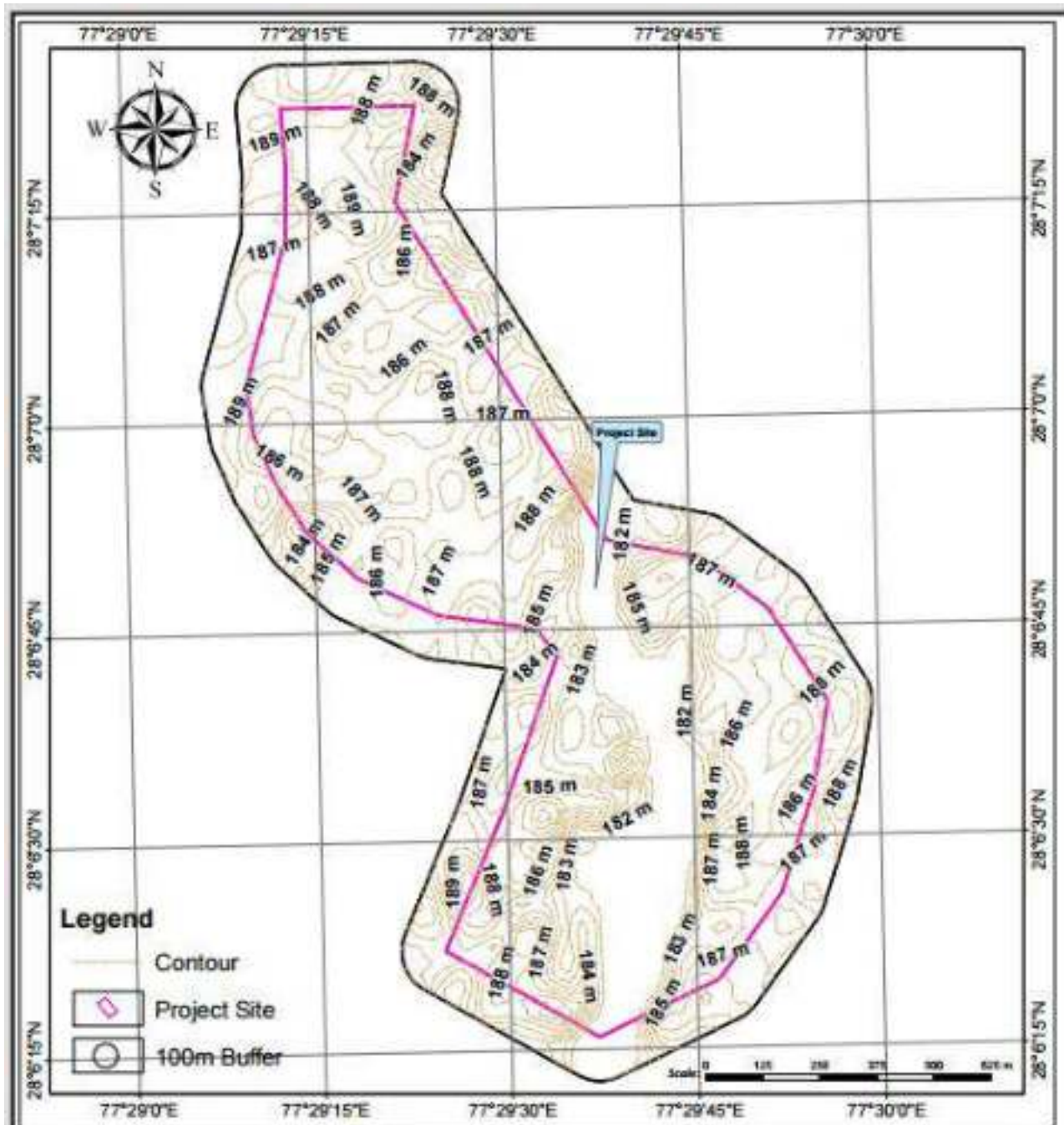
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2.3.2. Drainage Pattern / Mine Drainage

The river Yamuna flows from N to S direction slope. The general slope of the land surface is From N to S. Nearby area is almost flat topography of younger sedimentary formations, which are surrounded by fine-grained soil. Sand is transported and deposited in riverbed during Monsoon. Sometimes floods cross the riverbanks and deposit the sand in the flood plains as well. 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



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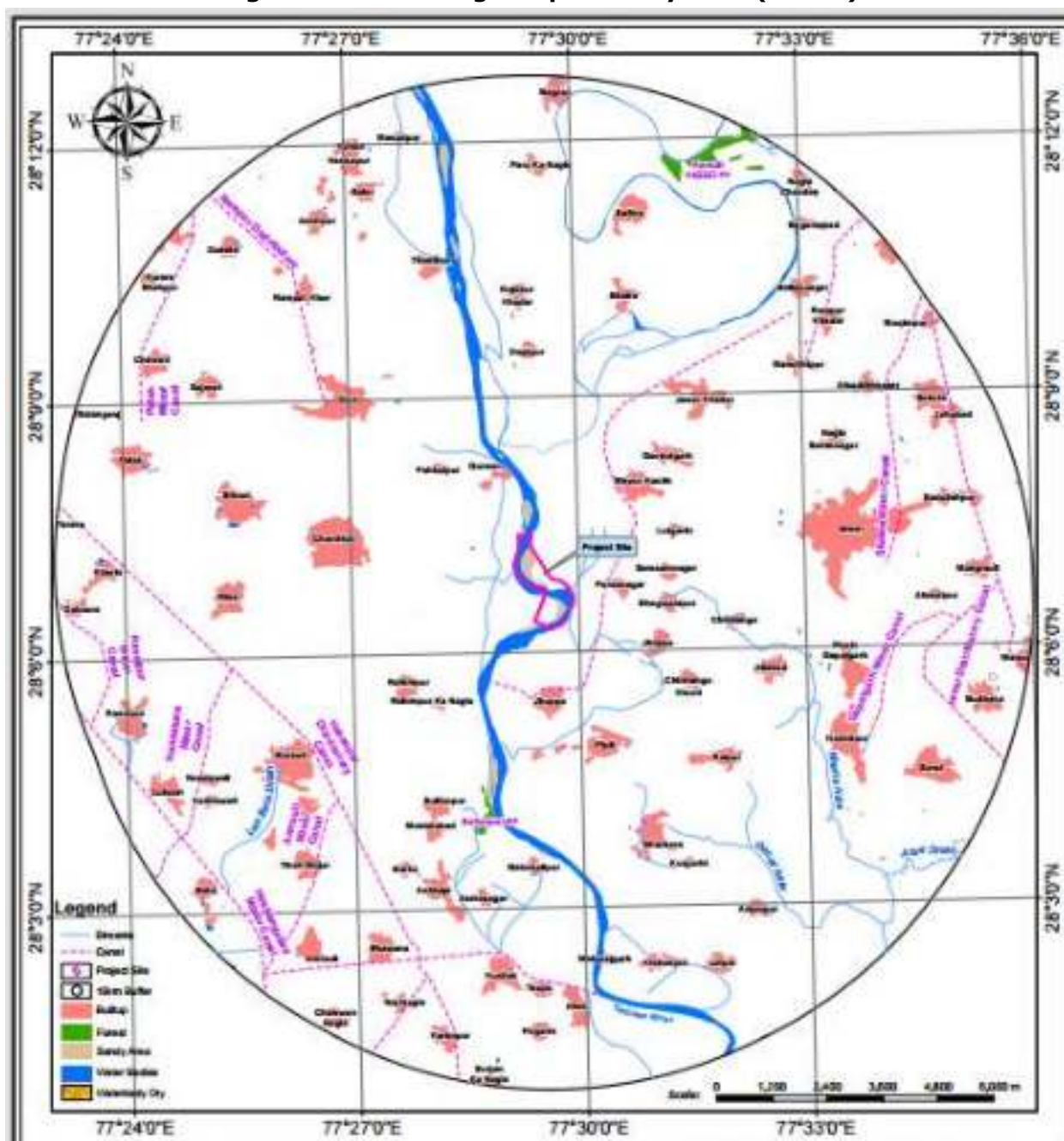
Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Table 2-1: Levels of Riverbed and Riverbank

Location/grid	Riverbed levels (mRL)	Riverbank top levels(mRL)
N 1800- E1000	127.25	130.00
N1500 -E1000	126.74	129.80
N500- E1500	126.18	129.10
N300 E 1600	124.78	128.17

Source: Approved Mining Plan

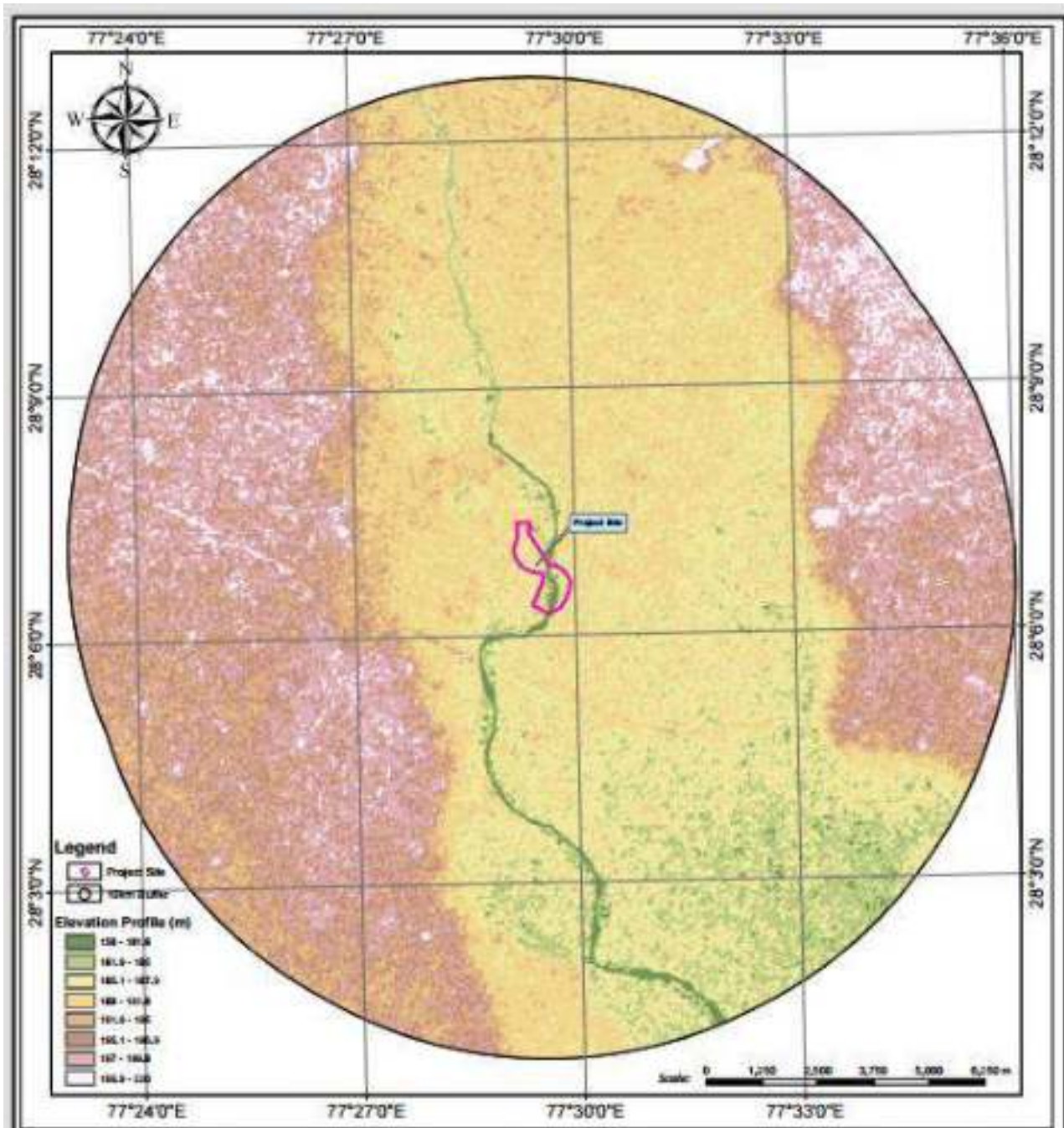
Figure 2.2: Drainage Map of Study Area (10 km)



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Figure 2.3: Elevation / Slope Profile of Study Area



2.4. Geology of the Area

2.4.1. Regional Geology

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).

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Figure 2.4: Geology Map of Haryana State

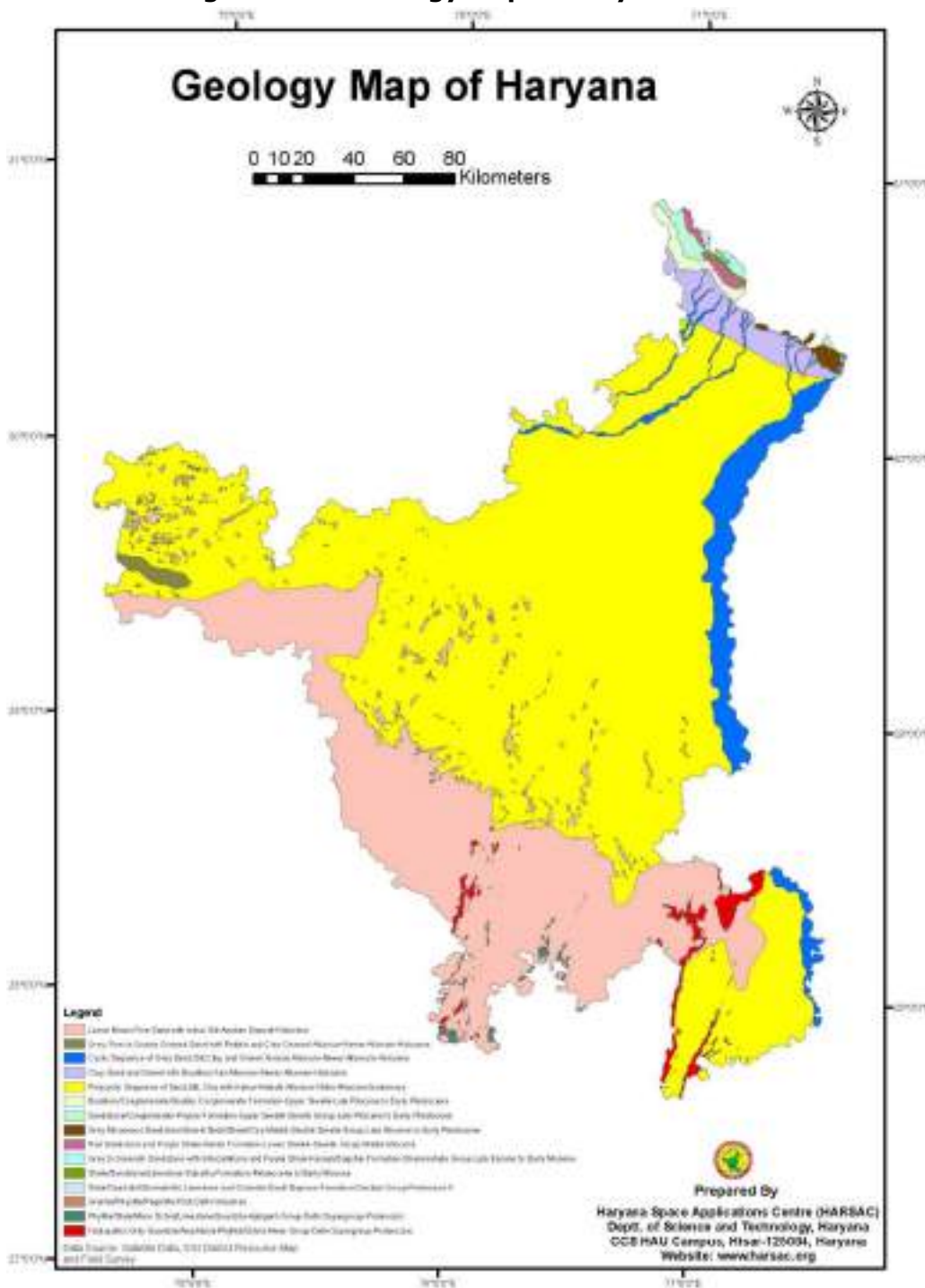


Table 2-2: Regional Geology of Palwal District

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.

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Series	Rock Types
	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.

Source: Approved Mining Plan

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.

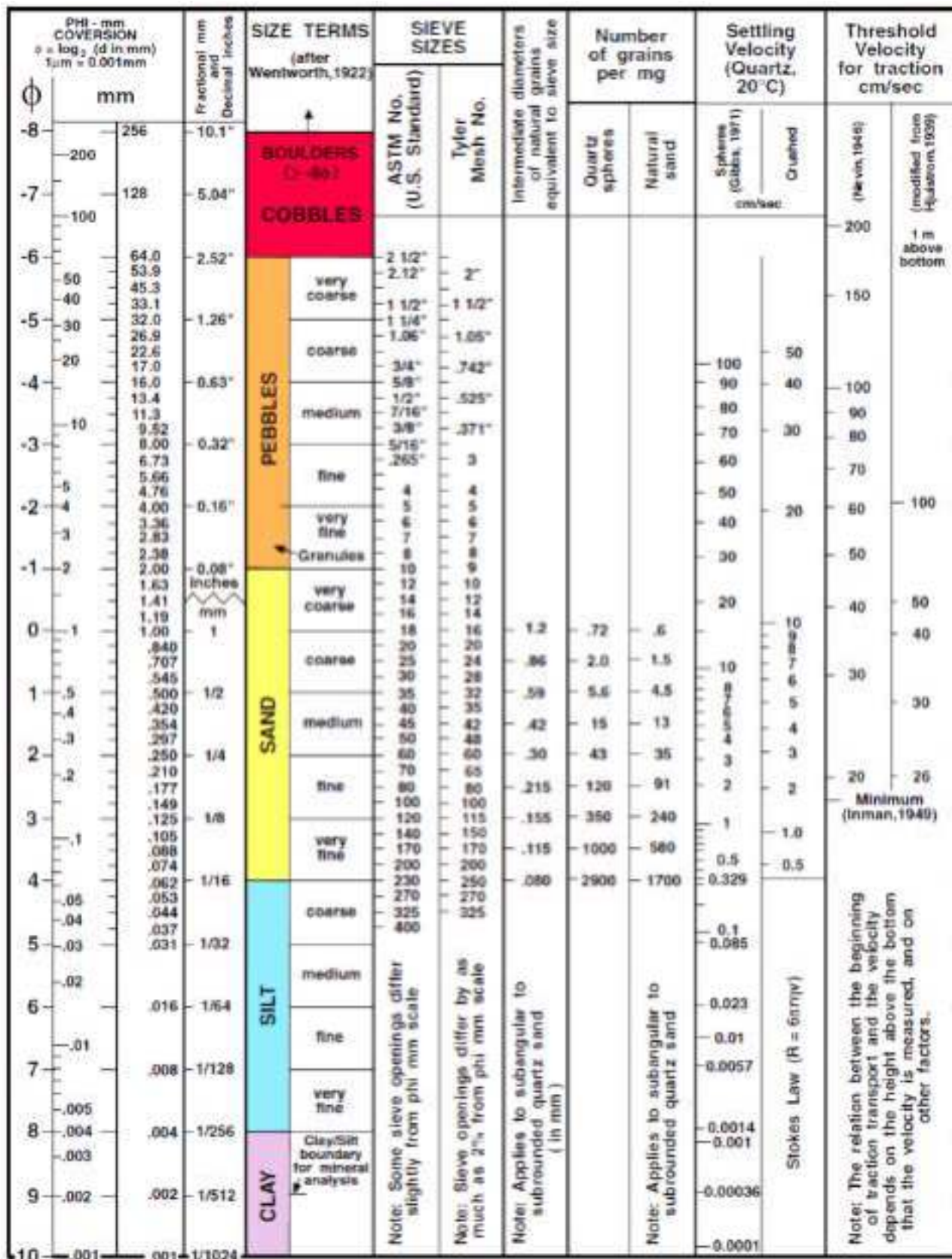
Sediments of various sizes and in mixed form are predominantly deposited in the riverbed and there is no perfect classification between sediments. These may be called as coarse sand, medium sand, and fine sand.

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.

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Figure 2.5: Size Distribution of Mineral



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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 sedimentology.

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

The factors which 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.

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- 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 is 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Table 2-3: Basin Area of Yamuna River

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

Source: Approved Mining Plan

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 increased 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.:

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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.: $S = 1280 Q^{0.46} (1.43 - 0.26 \log A)$

For $Q > 2$ in.: $S = 1965 e^{-0.055Q} (1.43 - 0.26 \log A)$

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 Chandhut (South) Block

Total Targeted Production is 43,35,000 MT/year.

- ✓ Area under riverbed: 227.86 Acre.
- ✓ Drainage basin area of river Yamuna and its tributaries in Haryana: 8214 square miles.
- ✓ Normal Annual Rainfall of Yamuna catchment is 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 45 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 from 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 from 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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.

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.
- f. The river does not have any water flow during the 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 have been calculated to take 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".

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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 is 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) Bulk density is based on the fact that the Regional Geology of the sub-Himalyas comprising subathu, Dhagsais, Kasaulis, and Shiwaliks shows that the major mineral constituents in the catchment area of River Yamuna and its Tributaries are composed of clay, sand, silt, sandstone, shale, limestone, marble, quartz, quartzite and ferruginous concretions etc. The bulk density of the constituent minerals is detailed as under.

Table 2-4: Details of Bulk Density

Mineral	Bulk density(g/cm ²)
Clay	1.63 to 2.60
Silt	1.80 to 2.20
Sand	1.70 to 2.30
Sandstone	2.0 to 2.60
Shale	1.77 to 2.5
Limestone	1.93 to 2.90
Quartzite	2.70 to 2.80
Quartz	2.65
Marble	2.67 to 2.75

Source: Approved Mining Plan

Sand is a mixture of above constituents mainly sand and silt. Therefore, the average density of River Sediments namely river sand is considered as 1.80.

- 4) The reserves of Sand calculated by volumetric method and are summarized here below:
Reserves in MT= Area in acres x 4000 x depth 3.0m x Bulk Density 1.80

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Table 2-5: Geological Reserve Estimation

Total area in acres	Mining area in acres	Ancillary area in acres	Blocked area in acres including bed bar, 7.5m & ¼ of riverbanks	Geological Reserves MT	Blocked reserves MT	Mineable reserves MT	Targeted Production MT
245.39	228.05	17.34	27.32	49,25,880	5,90,112	43,35,768	43,35,000

Source: Approved Mining Plan

A. PROVED RESERVES AS PER UNFC CODE (111)

Total Geological reserves: 49,25,880 MT

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

Total Blocked reserves= 5,90,112 MT

C. MINEABLE RESERVES

Mineable Reserves (A-B) = 43,35,768 MT

D. TARGETED PRODUCTION

43,35,000 MT per Year up to the lease period (or say 4.335 million MT/year)

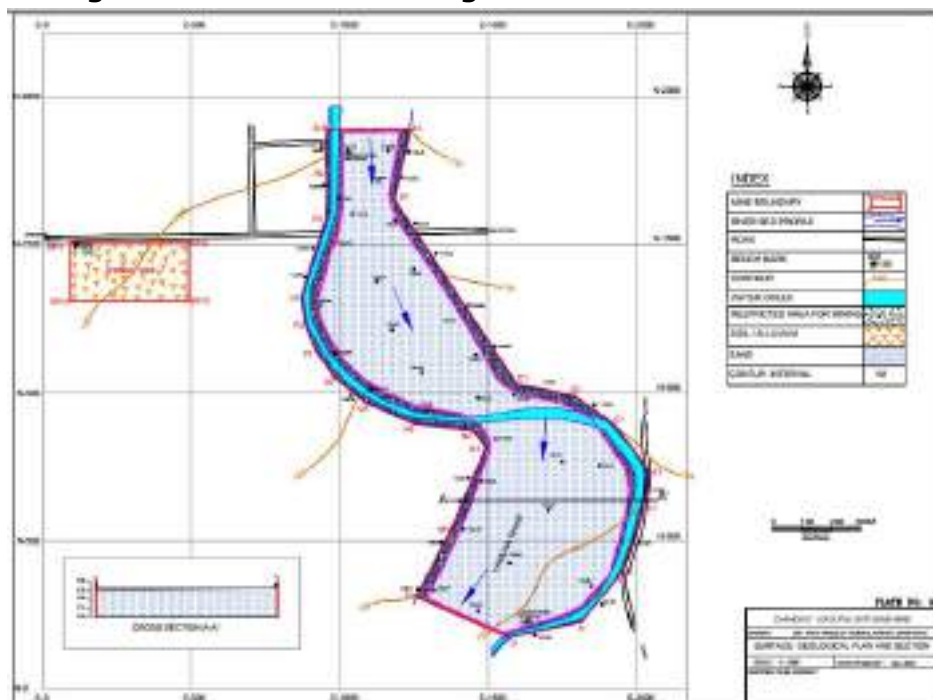
Note: Production from 2nd year onwards will depend on the quantity of mineral replenished. If the replenishment is more than the proposed production, then production of 4.35 million MT/year will be done. However, if the replenishment is less than the projected production then production will be reduced proportionately based on the quantum of replenishment.

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.

Figure 2.6: Surface Geological Plan & Section of Lease



DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

2.5. Mining Methodology

This is a new lease area allotted to the applicant. As it is a new mine. Area available for mining is 200.73 acres in Palwal district. Total length of the area as per the description report stretches in the length is 2.40 km. Mining activity will be carried in allocated only.

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 sand mines of Chandhut (South) Unit district Palwal are approachable from Highway No.- 2 and are about 15-18 Kms on the East side from the highway. The village Chandhut and sand quarries are very well connected. The same will be used to take the mineral transported to various destinations. Katcha roads will be developed from Tar Road to the mine site bypassing the villages.

2.5.1. Proposed Method

Mining work will be carried out by opencast mechanized 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.

Riverbed mining is for extracting sand from Yamuna Riverbed. Total length of the area as per the description report stretches in the length of 2.4 km. Mining activity will be carried out in allocated areas only.

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) 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.
- c) The contractor shall comply with all other conditions and stipulations as given in the LOI and Auction document dated 10.05.2023.
- d) No mining operation may be carried out from 01-07 to 15-09 every year (rainy season).
- e) Mining will be carried out about in about 268 days in a year.

Production Programme

Lease has been allotted for a period of 10 years only. Lease area consists of 245.39 acres in a total stretch of about 2.40 km. Out of this about 27.32 acres area is under restricted zone. About 200.73 acres area is free from restriction and the mining is proposed in this area only. Mining is proposed in both village river at a time.

Table 2-6: Details of Year-wise Production

S. No.	Name of Quarries	Area free from restrictions in acres	Per day production MT	Year wise Production MT
1	Chandhut (South) Unit)	200.73	16175	43,35,000

Source: Approved Mining Plan

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Daily production proposed = 16175 tons

Production programme is 647 trips/day@25 tone per trip

Working days have been taken as 268 days per annum

Projected Production per year = 268 x 16175 = 43,35,000 Tons

Table 2-7: Details of Five-Year Production

Year	Trips/ day	MMTPA
I	647	4.335
II	647	4.335
III	647	4.335
IV	647	4.335
V	647	4.335

Source: Approved Mining Plan

Proposed rate of production when the mine is fully developed

Work will be carried out for 268 days in year. Year-wise production during the plan period will be as follows;

Table 2-8: Details of Proposed Year-wise Production of Mineral & OB/Waste

Year	Targeted Production MMT/annum	OB/ Waste (M ³)
1	4.335	-
2	4.335	-
3	4.335	-
4	4.335	-
5	4.335	-

Source: Approved Mining Plan

Mineable reserves and anticipated life of the mine

Lease will be granted for a period of 10 years only as per HMMCR, 2012. During rainy season there is replenishment of the mineral, which helps in sustaining the production.

Estimated Mineable reserves up to 3.0 m available are = 43,35,768 MT which are replenished every year during rains.

Proposed targeted Production= 43,35,000 MT/year

Anticipated production during lease period will be 43.35 million MT

2.5.2. Details of Production & Dispatches of Five Years

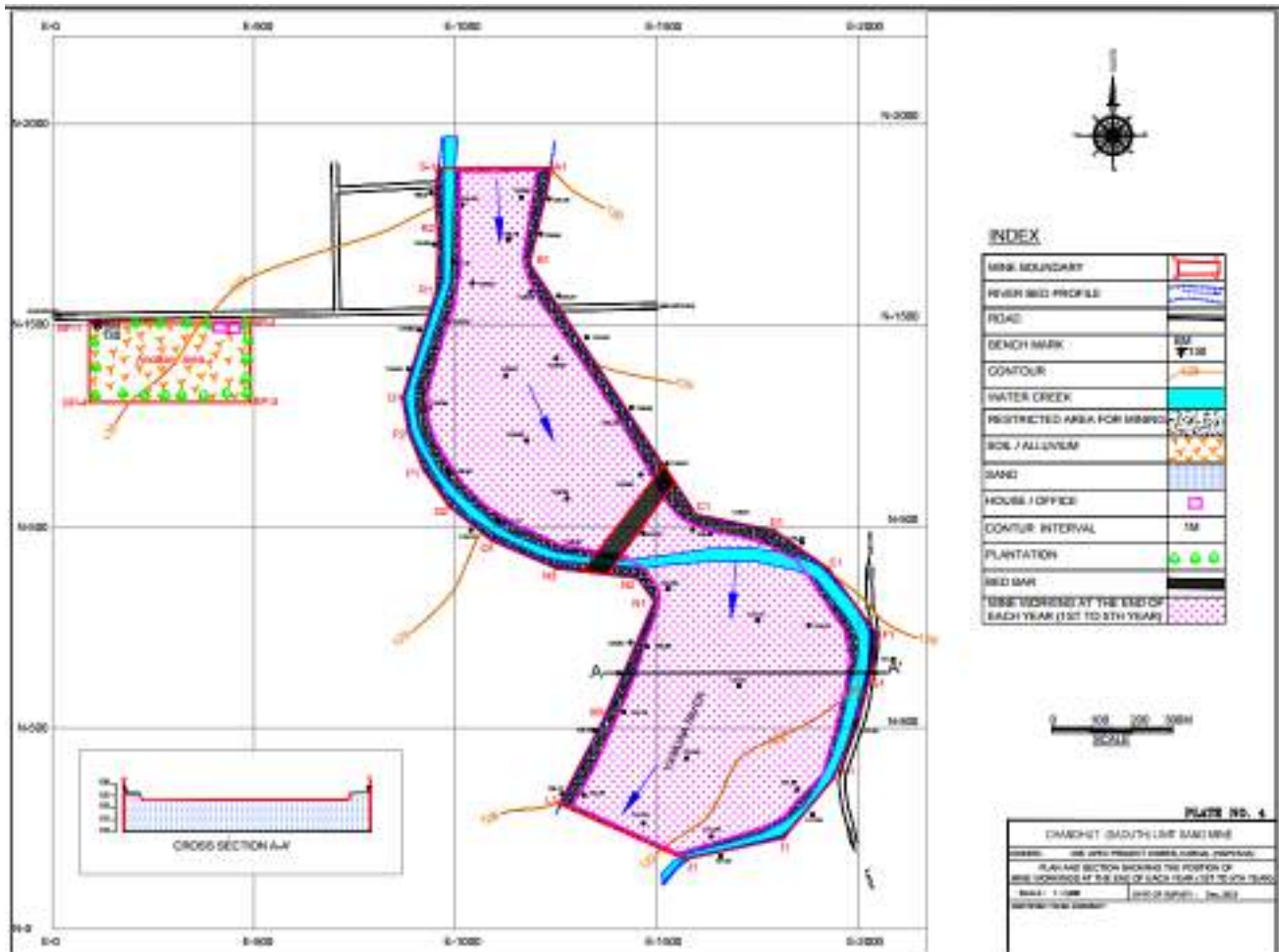
PHYSICAL & GEOGRAPHICAL CHARACTERISTIC OF THE DEPOSIT:

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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Figure 2.7: Working / Production Plan



2.5.3. 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 2.40 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. In 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

- 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 counter 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"**.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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.

2.5.4. Extent of Mechanization

Following equipment are proposed to be deployed for the desired production.

Table 2-9: List of Machinery

S. No.	Name of machinery	Capacity	Nos.	Engagement
1	Excavator cum loader	2.0 m ³	11	Hire Basis
2	Tippers/ Trucks	40 tons	130	Hire Basis
3	Water Tanker	10,000 liters	2	Hire Basis
4	Light vehicles	--	2	-

Source: Approved Mining Plan

Fuel Consumption: The diesel requirement for the mining operation will be 15560 Litre / day in peak production stage. The break-up of diesel consumption is given below.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Table 2-10: 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 130 Dumper = $130 \times 100 = 13,000$ Liter	13,000 liter
2.	JCB	Diesel consumption 10 ltr / hr working of 20 hrs diesel consumption = $11 \times 20 \times 10 = 1200$ ltr	1200 liter
3.	Water Tankers	Diesel consumption 10 ltr/Hour $\times 10 \times 2 = 200$	200 liter
4.	Light Vehicles	Diesel consumption 8 ltr/Hour $\times 10 \times 2 = 160$ ltr	160 liter
Total diesel requirements per day			15,560 liter

Source: Approved Mining Plan

2.5.5. Water Demand

The requirement of water for the project will be sourced from private water tankers. The total water demand will be 37.7 KLD which will conclude dust suppression (16.1 KLD), green belt development (13.7 KLD) & domestic requirement (7.9 KLD). Details are given in Table 1.2.

2.5.6. Electricity Requirement

Electrical supply is available in all nearby villages.

2.5.7. 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 2.4 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.

2.5.8. 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. Total requirement of employee (skilled & unskilled) will be required 175 which may be sourced from nearest villages as per their skills.

Table 2-11: Manpower Requirement

S. No.	Category	Numbers
1	Manager – 1 st Class	1
2	Assistant managers	2
3	Foreman/Mates	2
4	Supervisory staff	2
5	Skilled personnel	16
6	Semi-skilled personnel	140
7	Un-skilled personnel	12
Total		175

Source: Approved Mining Plan

2.5.9. Drilling & Blasting

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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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2.5.10. Mine Drainage

The river Yamuna flows from N to S direction slope. Nearby area is almost flat topography of younger sedimentary formations, which are surrounded by fine-grained soil. Sand is transported and deposited in riverbed during monsoon. Sometimes flood crosses the riverbanks and deposit the sand in the flood plains as well.

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. 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. Land use pattern will be as follows:

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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Figure 2.8: Reclamation Plan

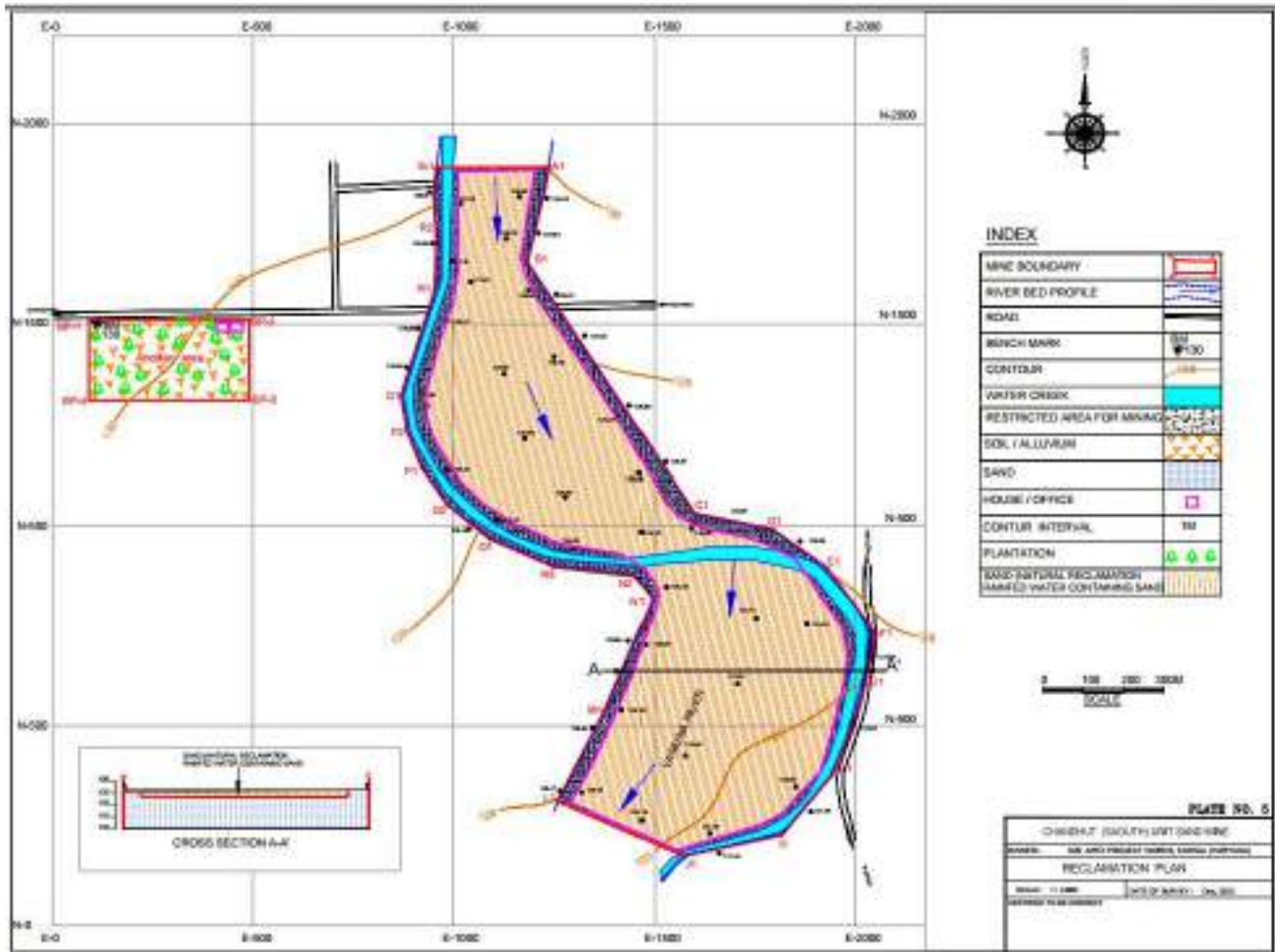


Table 2-12: Land-Use Breakup at Present and Conceptual Stage

Particulars	Present Land-use (acres)	End of 5 Year (acres)
Pit Area	0.0	0.0
Dump Area	0.0	0.0
Restricted Area	27.32	27.32
Mineral Storage, and ancillary area, office etc	17.34	17.34
Plantation (In safety zone* and ancillary area)	0.00	5.00*
Area for mining/Naturally Reclaimed Area	200.73	200.73
Total	245.39	245.39

***Plantation in 5.0 Ha land will be done under social forestry and plantation & infrastructure will be restricted to the ancillary area only.**

2.6.2. 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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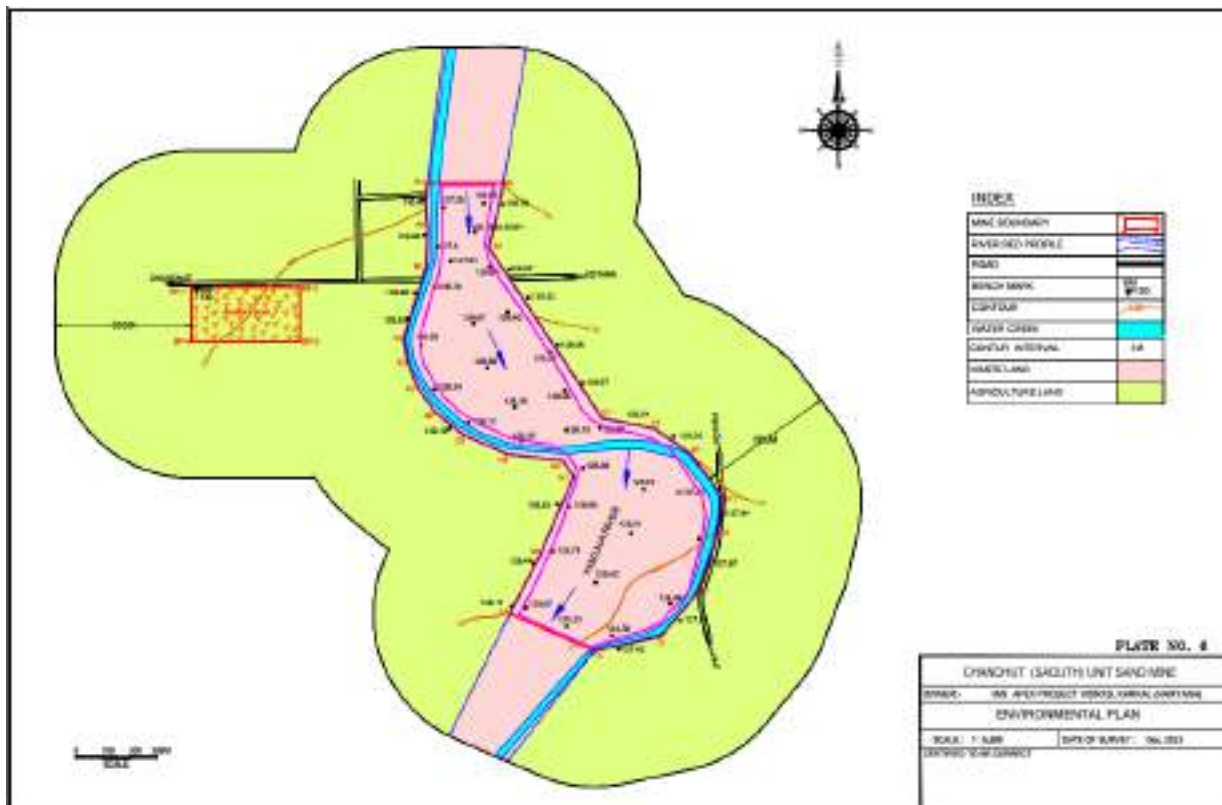
- b. Prevent damages to the river regime.
- c. Protect riverine configuration such as bank erosion, change of water course gradient, flow regime etc.
- d. Prevent contamination of ground water.

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 yearly.

Table 2-13: Environmental Plan



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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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.

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.

Forestation programme shall be carried out basically, along the mine boundaries and roads as permitted by landowners. The mining area in the riverbed 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, Guava, 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 riverbed 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. Riverbanks 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.

2.7. Progressive Mine Closure Plan

2.7.1. Mined-Out Land

Land use at various stages is given in Table 2.13. About 200.73 acres area will be mined out.

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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 not be 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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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2.8. Stacking of Mineral Rejects & Disposal of Waste

As stated earlier, no waste of any kind will be produced. No soil or any other waste will be generated during Riverbed Mining. Only sand mineral is targeted for 16175 tons per day i.e., 4.335 million tones per annum (maximum). Extraction is planned for 5 years duration which is proposed to be continued up to lease period.

2.9. Summary

The total proposed production is 43,35,000 MTPA of mineral sand from riverbed of Yamuna over in area of 200.73 acres minable area excluding the 27.32 acres restricted area. This mining project will provide employment to 175 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 13,710 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**

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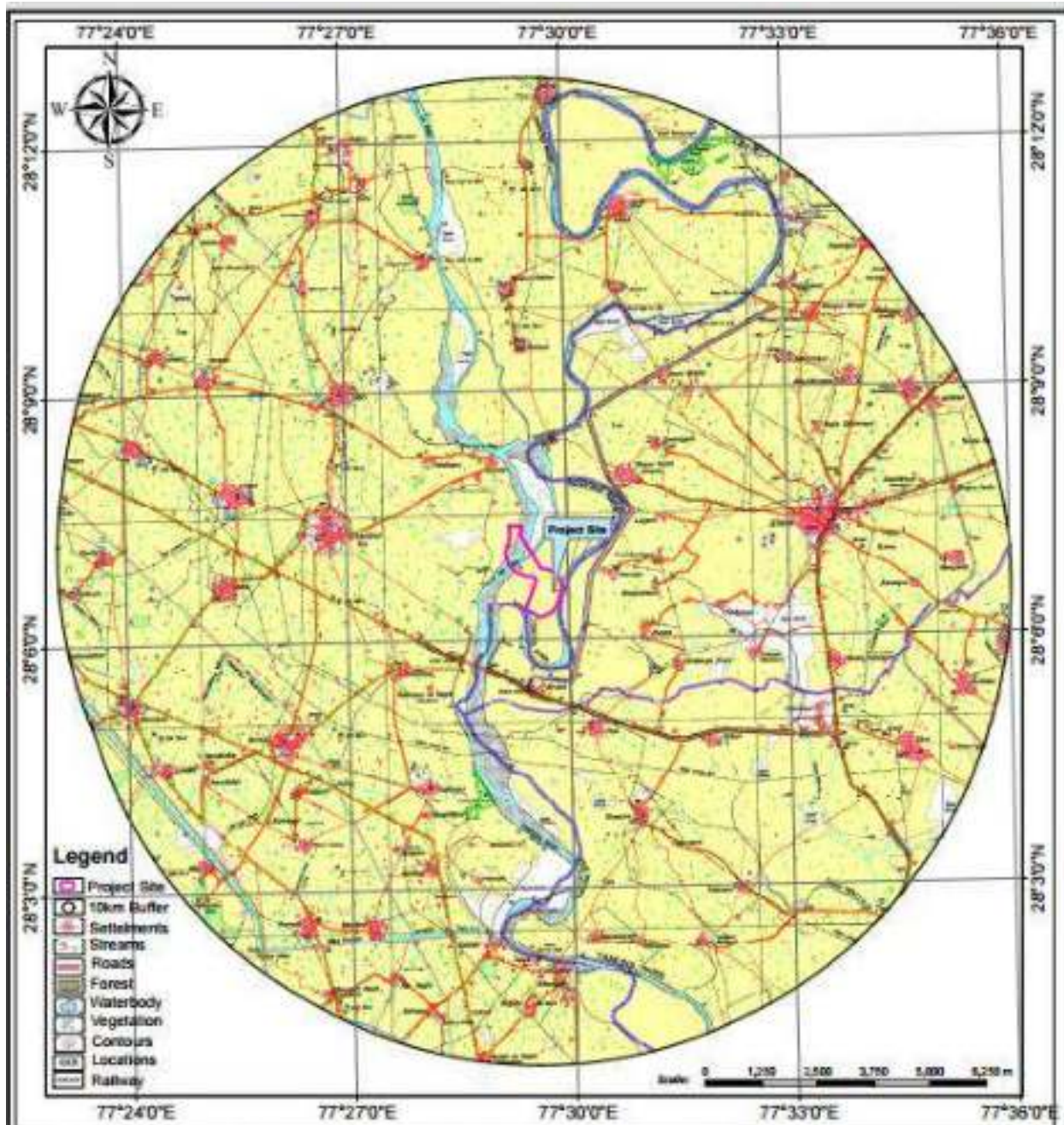
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3. Description of Environment

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



DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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 pre-monsoon season (March to May 2024) 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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- ✓ 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 complete 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	Divisional 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

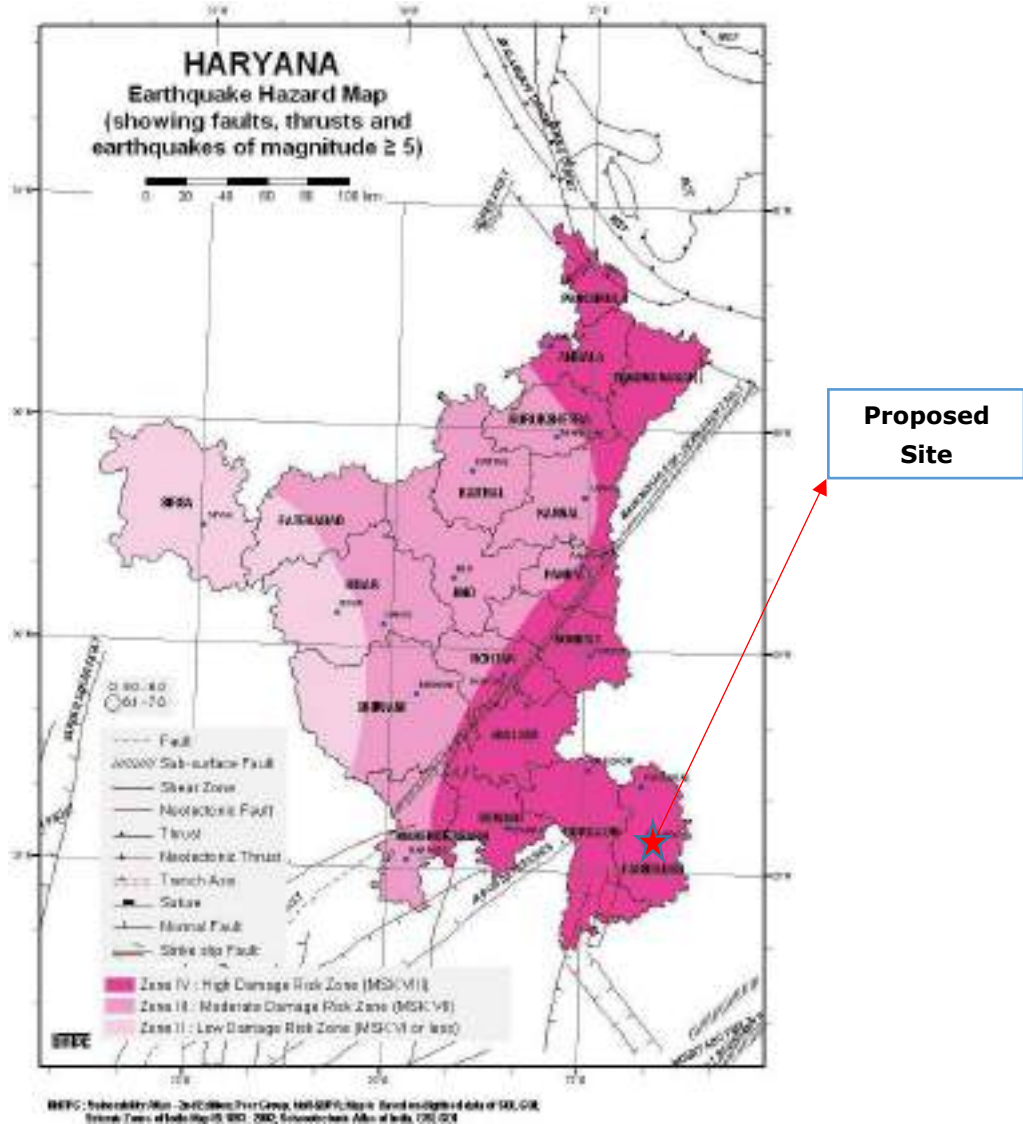
The area which has struck by the present event has been described as a region of Seismic Zone-IV which is defined as high damage risk zone (MSK intensity < VIII) in the Seismic Map of Haryana. Adequate measures need to be adopted during operation phase of the project-by-project proponent.

Seismic Hazard of Haryana: The seismic zoning map of Haryana is shown in Figure 3.2. Ambala, Sonapat, Rohtak, Karnal, Gurgaon, Faridabad, Panipat, Rewari and Yamuna Nagar districts lie in Zone IV. The districts of Kurukshetra, Jind, Hissar, Bhiwani, Mahendragarh 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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 seen 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 earthquakes 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

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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. G43F5, G43F9, H43X7, H43X8, H43X11 & H43X12 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 (86.33%) by following Wasteland (6.45%) & built-up area (5.11%) of the total study area.

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Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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

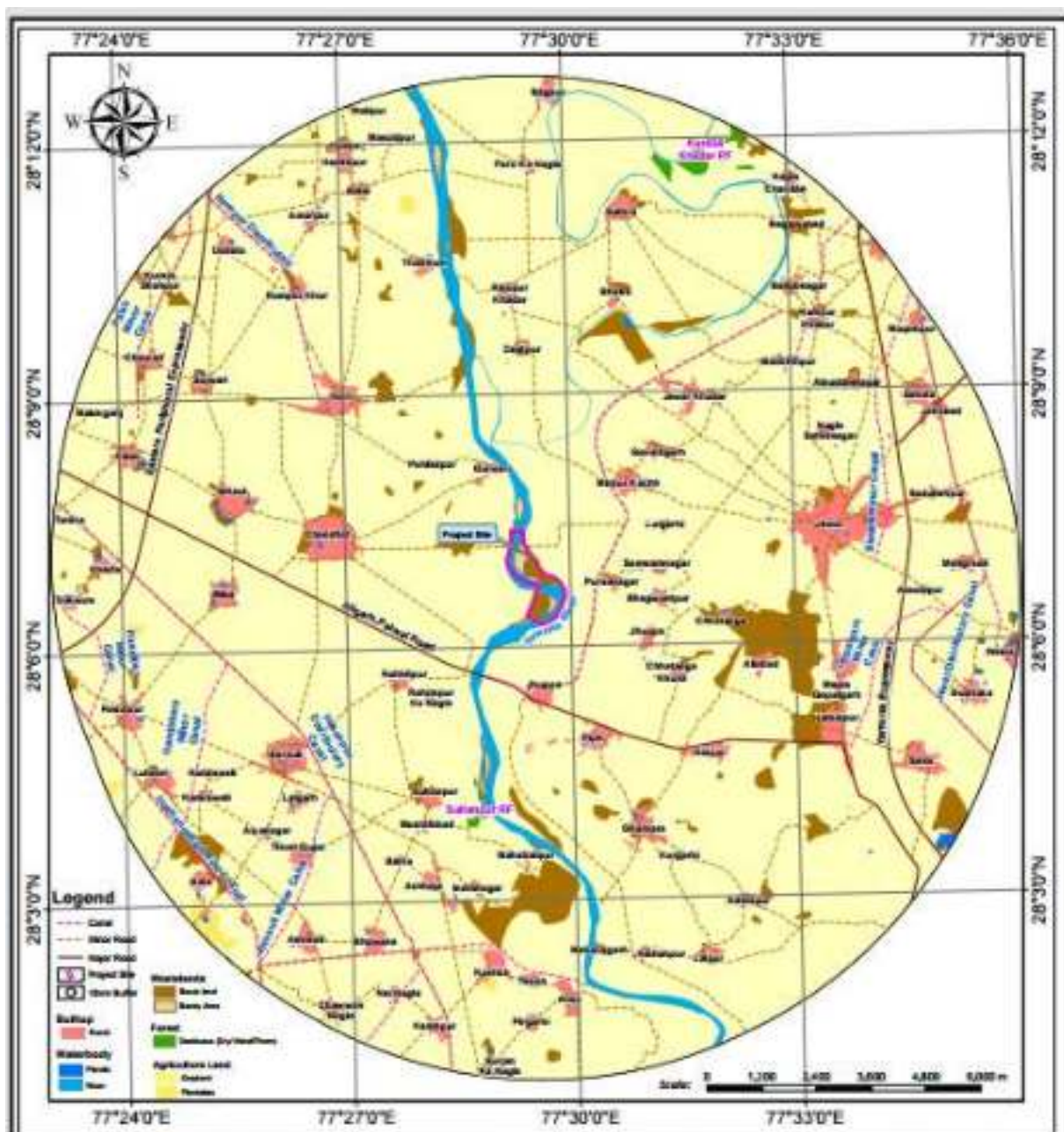


Table 3-2: Land-use Classification of the Study Area

Classification (Level 1)	Category (Level 2)	Sub_Category (Level 3)	Area in Hectare	Area in %
Builtup	Rural	Rural	1876.96	5.11
Agriculture Land	Cropland		103.11	0.28
	Agriculture Plantation		31600.74	86.05
Waterbody	Ponds	Permanent	33.69	0.09
		Seasonal	59.05	0.16
	River	Non Perennial	604.05	1.64
Wastelands	Scrub land	Open Scrub	2290.36	6.24
	Sandy Area		76.85	0.21

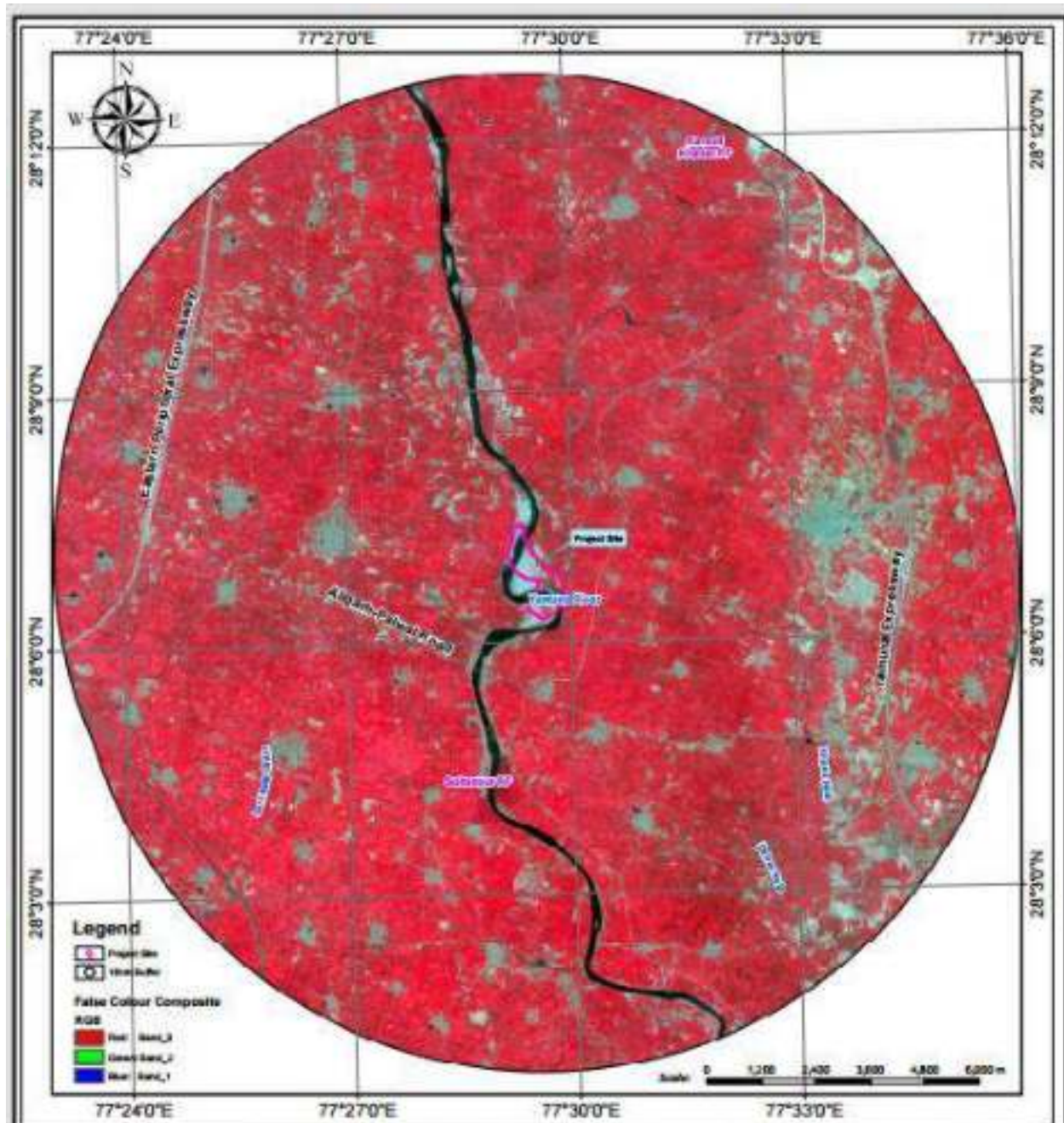
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Classification (Level 1)	Category (Level 2)	Sub_Category (Level 3)	Area in Hectare	Area in %
Forest	Deciduous (Dry / Moist / Thorn)		80.19	0.22
Total			36725.00	100.00

Source: SOI Toposheet No. G43F5, G43F9, H43X7, H43X8, H43X11 & H43X12.

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 are wasteland and waterbody as this is sand mining project from riverbed of Yamuna. Area land-use is detailed below.

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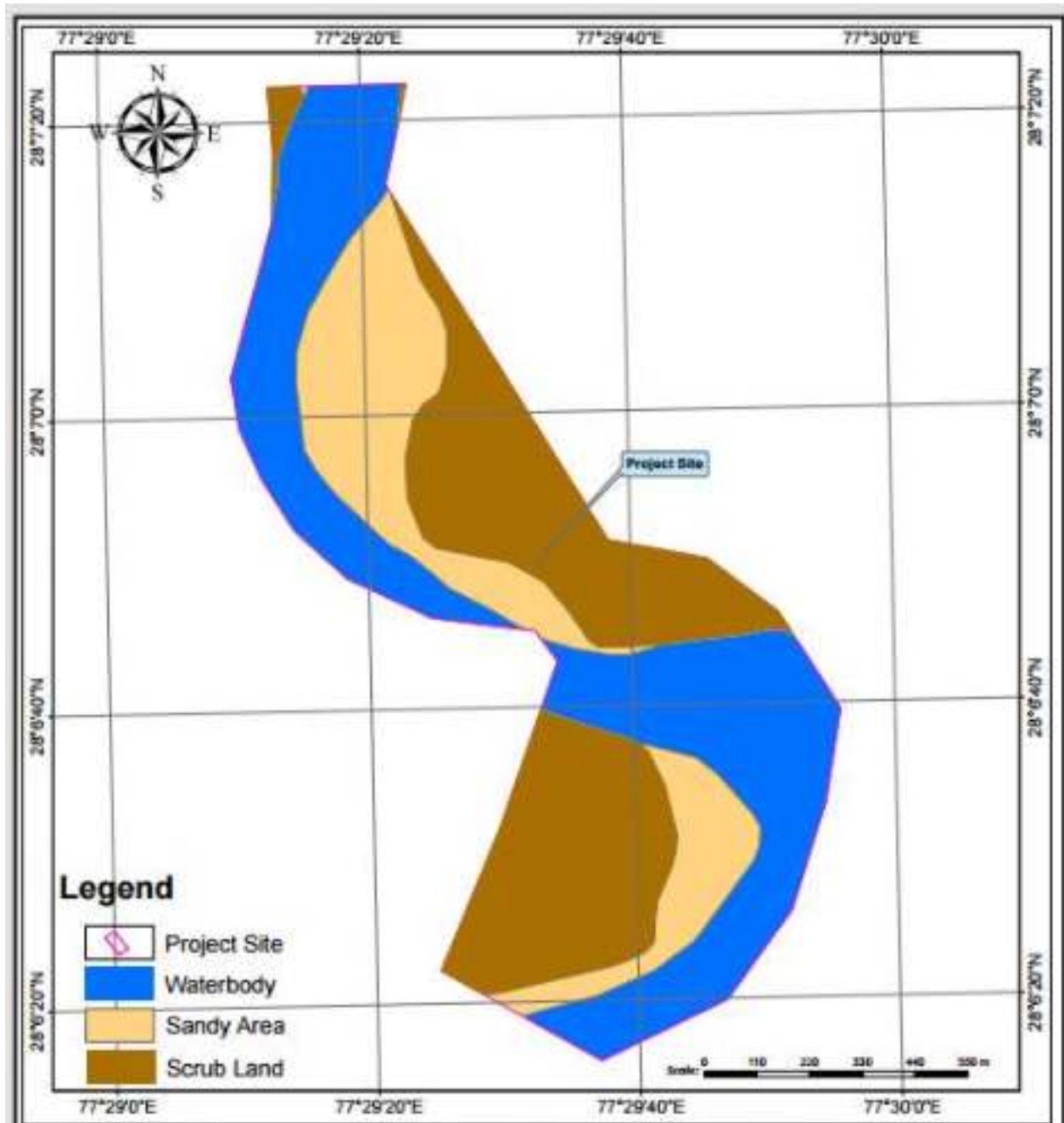
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Table 3-3: Land-use Classification of the Project Site

Classification (Level 1)	Category (Level 2)	Sub_Category (Level 3)	Area in Hectare	Area in %
Wastelands	Scrub land	Open Scrub	40.97	37.43
	Sandy Area		25.70	23.48
Waterbody	River	Non-Perennial	42.79	39.09
Total			109.46	100.00

Source: SOI Toposheet No. H43X8.

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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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.

Figure 3.6: Soil Sampling Locations

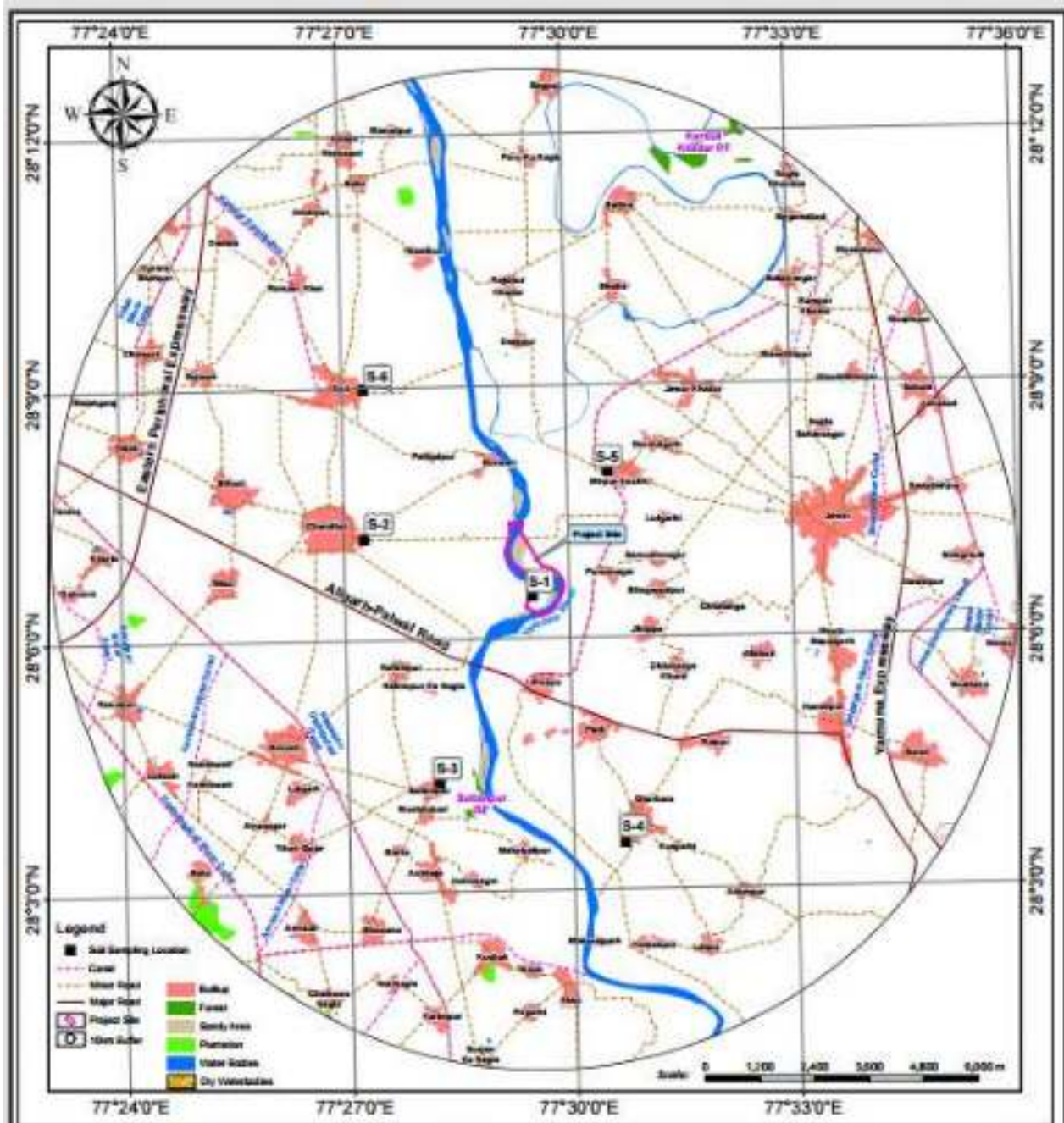


Table 3-4: Soil Sampling Locations

S. No.	Name	Code	Distance	Direction	Latitude	Longitude
1	With In Project Site	S-1	0.2	NE	28° 6' 30.230" N	77° 29' 30.263" E
2	Chandhut	S-2	3.2	W	28° 7' 12.656" N	77° 27' 15.924" E
3	Sultanpur	S-3	4.2	SSW	28° 4' 17.725" N	77° 28' 12.832" E
4	Gharbara	S-4	5.2	SSE	28° 3' 34.092" N	77° 30' 41.363" E

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Name	Code	Distance	Direction	Latitude	Longitude
5	Mirpur Kachh	S-5	2.1	ENE	28° 7' 58.439" N	77° 30' 32.337" E
6	Gori	S-6	4.3	NW	28° 8' 58.701" N	77° 27' 17.356" E

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	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <4.5 Extremely acidic 4.51- 5.50 Very strongly acidic 5.51-6.0 moderately acidic 6.01-6.50 slightly acidic 6.51-7.30 Neutral </td> <td style="width: 50%; vertical-align: top;"> 7.31-7.80 slightly alkaline 7.81-8.50 moderately alkaline 8.51-9.0 strongly alkaline 9.01 very strongly alkaline </td> </tr> </table>	<4.5 Extremely acidic 4.51- 5.50 Very strongly acidic 5.51-6.0 moderately acidic 6.01-6.50 slightly acidic 6.51-7.30 Neutral	7.31-7.80 slightly alkaline 7.81-8.50 moderately alkaline 8.51-9.0 strongly alkaline 9.01 very strongly alkaline
<4.5 Extremely acidic 4.51- 5.50 Very strongly acidic 5.51-6.0 moderately acidic 6.01-6.50 slightly acidic 6.51-7.30 Neutral	7.31-7.80 slightly alkaline 7.81-8.50 moderately alkaline 8.51-9.0 strongly alkaline 9.01 very strongly alkaline		
Salinity Electrical Conductivity (mmhos/cm) (1 ppm = 640 mmhos/cm)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> Upto 1.00 Average 1.01-2.00 harmful to germination </td> <td style="width: 50%; vertical-align: top;"> 2.01-3.00 harmful to crops (sensitive to salts) </td> </tr> </table>	Upto 1.00 Average 1.01-2.00 harmful to germination	2.01-3.00 harmful to crops (sensitive to salts)
Upto 1.00 Average 1.01-2.00 harmful to germination	2.01-3.00 harmful to crops (sensitive to salts)		
Organic Carbon	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> Upto 0.2: very less 0.21-0.4: less 0.41-0.5 medium, </td> <td style="width: 50%; vertical-align: top;"> 0.51-0.8: on an average sufficient 0.81-1.00: sufficient >1.0 more than sufficient </td> </tr> </table>	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
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)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> Upto 50 very less 51-100 less 101-150 good </td> <td style="width: 50%; vertical-align: top;"> 151-300 Better >300 sufficient </td> </tr> </table>	Upto 50 very less 51-100 less 101-150 good	151-300 Better >300 sufficient
Upto 50 very less 51-100 less 101-150 good	151-300 Better >300 sufficient		
Phosphorus (Kg/ha)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> Upto 15 very less 16-30 less 31-50 medium, </td> <td style="width: 50%; vertical-align: top;"> 51-65 on an average sufficient 66-80 sufficient >80 more than sufficient </td> </tr> </table>	Upto 15 very less 16-30 less 31-50 medium,	51-65 on an average sufficient 66-80 sufficient >80 more than sufficient
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)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> 0 -120 very less 120-180 less 181-240 medium </td> <td style="width: 50%; vertical-align: top;"> 241-300 average 301-360 better >360 more than sufficient </td> </tr> </table>	0 -120 very less 120-180 less 181-240 medium	241-300 average 301-360 better >360 more than sufficient
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	----	7.6	7.2	7.4	7.9	7.8	7.4
Electrical Conductivity	µmhos /cm	351	408	337	398	416	366
Moisture	%	13.7	15.4	16.4	13.7	13.7	15.9
Soil texture	USDA System	Loam	Loam	Loam	Sandy Loam	Loam	Sandy Clay Loam
Sand	%	41	46	39	52	43	49
Silt	%	40	31	36	28	39	27
Clay	%	19	23	25	20	18	24
Infiltration Rate	cm/hr	1.55	1.42	1.43	1.55	1.28	1.46
Bulk density	gm/cm ³	1.48	1.54	1.58	1.51	1.55	1.56
Porosity	%	43.2	44.0	43.6	44.0	44.2	44.4
Iron (DTPA Extractable)	mg/kg	1.57	1.87	2.34	2.18	1.85	2.22

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Parameters	Unit	S-1	S-2	S-3	S-4	S-5	S-6
Zinc (DTPA Extractable)	mg/kg	2.31	2.31	2.64	2.15	2.01	2.06
Copper (DTPA Extractable)	mg/kg	3.51	3.14	3.51	3.63	2.94	3.15
Sodium as Na	mg/kg	26	22	28	22	32	20
Calcium as Ca	mg/kg	1564	1824	1824	1716	1924	1564
Magnesium as Mg	mg/kg	136	151	142	176	195	166
SAR Value	USDA System	1.26	0.99	1.28	1.00	1.37	0.95
Nitrogen as N	kg/ha as N	134	156	164	171	163	182
Phosphorus	kg/ha as P	16	12	18	24	21	32
Potassium as K	kg/ha as K	162	136	158	164	159	128
Organic Carbon	%	0.59	0.77	0.65	0.73	0.76	0.78
Organic matter	%	0.98	1.20	1.16	1.46	1.02	1.62

SQ-Soil Sampling Locations

Results Interpretation: The soil was predominantly Loamy in the study area. The pH was ranges 7.2 to 7.9 which were neutral to slightly alkaline mostly as per ICAR guideline. The conductivity was varying from 337 μ mhos/cm to 416 μ mhos/cm in the study area which is average as per ICAR guidelines which is good to crops. Organic Carbon was varying from 0.59 % to 0.78 % which is between less & medium as per ICAR guidelines as mostly locations are near to river. Nitrogen was varying from 134 kg/ha to 171 kg/ha which is between good & better as per ICAR guidelines and good to crops. Phosphorous was varying from 12 kg/ha to 24 kg/ha which is between very less as per ICAR guidelines for crops. Potassium was varying from 128 kg/ha to 164 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

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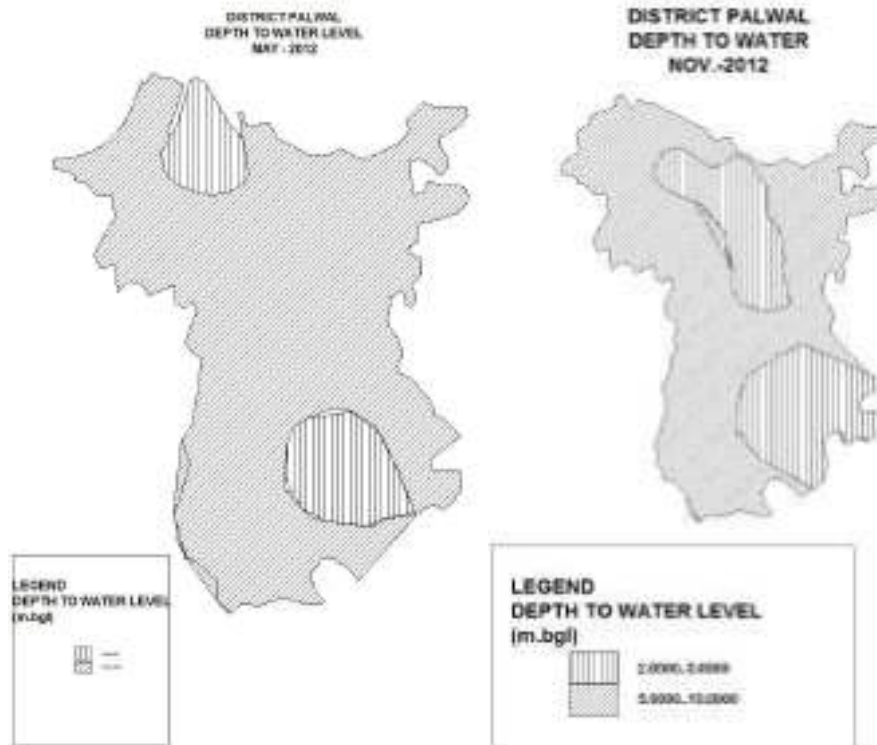
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determined. Shallow tube wells for irrigation use are generally constructed up to a depth of 40 m. The discharge of these shallow tube wells range 360 - 600 litres per minutes.

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, 6 samples were collected from dug wells. Sampling locations with co-ordinates are given below in Table 3.7. The water level from dug wells was varying from

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

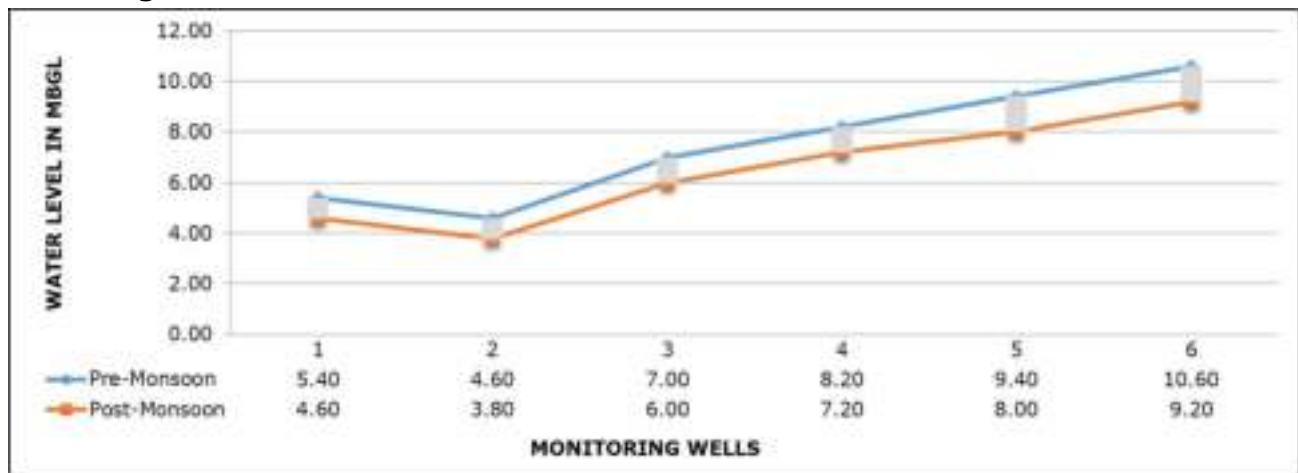
4.60 MBGL to 10.60 MBGL in pre-monsoon and 3.80 MBGL to 9.20 MBGL in post-monsoon season. Ground water fluctuation difference was observed from 0.8 MBGL to 1.4 MBGL in the study area.

Table 3-7: Ground Water Level Fluctuation in Area

Location	Latitude	Longitude	Pre-Monsoon	Post-Monsoon
WL - 1	28° 6'1.12"N	77°30'25.31"E	5.40	4.60
WL - 2	28° 7'15.01"N	77°27'7.55"E	4.60	3.80
WL - 3	28° 4'18.35"N	77°28'2.17"E	7.00	6.00
WL - 4	28° 3'39.10"N	77°30'50.38"E	8.20	7.20
WL - 5	28° 7'57.28"N	77°30'36.11"E	9.40	8.00

*WL- Ground Water Level Location

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° 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 pre-monsoon season (March to May 2024). Six ground water samples 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Figure 3.9: Water Sampling Locations

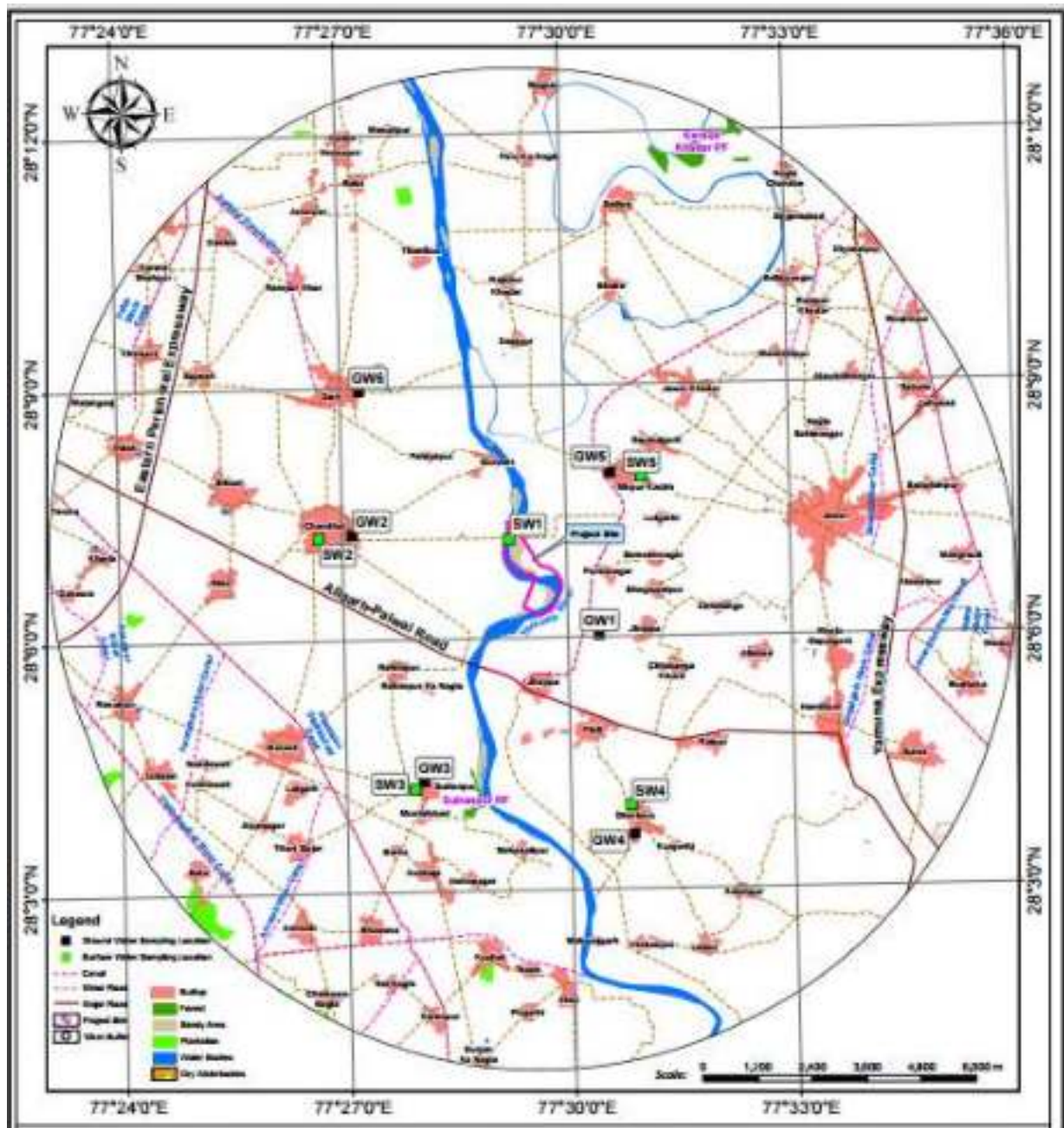


Table 3-8: Ground Water Sampling Location

Location Name	Code	Distance	Direction	Latitude	Longitude
Jhuppa	GW1	1.4	ESE	28° 6' 1.115" N	77° 30' 25.307" E
Chandhat	GW2	3.4	W	28° 7' 15.008" N	77° 27' 7.547" E
Sultanpur	GW3	4.4	SW	28° 4' 18.346" N	77° 28' 2.167" E
Gharbara	GW4	5.2	SSE	28° 3' 39.097" N	77° 30' 50.384" E
Mirpur Kachh	GW5	2.2	ENE	28° 7' 57.280" N	77° 30' 36.105" E
Gori	GW6	4.3	NW	28° 8' 57.265" N	77° 27' 14.811" E

HP- Hand Pump

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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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acidified with 1 ml HNO₃. Parameters like dissolved oxygen (DO) and pH were analysed at the time of sample collection. The analyse details of ground water is given below.

Table 3-9: Ground Water Results

S. No.	Parameters	Unit	Handpump						IS 10500 :2012	
			GW-1 Jhupp a	GW-2 Chandh ut	GW-3 Sultanp ur	GW-4 Gharbar a	GW-5 Mirpu r Kach h	GW-6 Gori	Acceptab le limits	Permissib le limits
1	pH	--	7.58	7.20	7.50	7.10	7.80	7.85	6.5-8.5	NR
2	Conductivity	µS/cm	1345	1402	1309	1357	1423	1349	\$	\$
3	Total Dissolve Solids	mg/l	809	846	789	816	851	816	500	2000
4	Alkalinity as CaCO ₃	mg/l	241.9	274.3	219.5	225.6	267.6	251.4	200	600
5	Total Hardness as CaCO ₃	mg/l	298.6	309.6	287.5	304.6	288.4	291.1	300	600
6	Calcium as Ca	mg/l	69.5	74.8	62.7	66.9	61.9	69.4	75	200
7	Magnesium as Mg	mg/l	35.6	36.4	33.7	31.8	35.4	33.1	30	100
8	Sodium	mg/l	127	129	131	139	152	129	\$	\$
9	Potassium	mg/l	19	21	18	23	16	21	\$	\$
10	Bicarbonate	mg/l	241.9	274.3	219.5	225.6	267.6	259.7	\$	\$
11	Chloride as Cl	mg/l	248.6	241.9	256.6	262.9	251.7	247.6	250	1000
12	Sulphate as SO ₄	mg/l	54.6	51.8	47.5	56.9	59.6	39.8	200	400
13	Nitrate as NO ₃	mg/l	11.9	13.6	12.4	11.4	10.7	12.9	45	NR
14	Total Nitrogen as N	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	\$	\$
15	Flouride as F	mg/l	0.80	0.99	0.75	0.65	0.74	0.65	1.00	1.50
16	Total Phosphorus as P	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	\$	\$
17	Phenolic compound as C ₆ H ₅ OH	mg/l	<0.001	<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	0.05	NR
19	Aluminium	mg/l	<0.03	<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	0.01	0.05
21	Cadmium	mg/l	<0.003	<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	0.05	NR
23	Iron	mg/l	0.25	0.18	0.21	0.26	0.14	0.166	0.29	0.24
24	Copper	mg/l	<0.05	<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	0.01	NR
26	Manganese	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	0.3

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Source			Handpump						IS 10500 :2012	
S. No	Parameters	Unit	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	Acceptable limits	Permissible limits
			Jhupp a	Chandhut	Sultanpur	Gharbara	Mirpur Kachh	Gori		
27	Mercury	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	NR
28	Zinc	mg/l	2.36	2.14	3.14	2.51	2.39	2.44	5	15

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

GROUND WATER RESULTS INTERPRETATION

The water was tested for different things that can affect its quality and safety. The pH was between 7.10 and 7.85, which means the water was not too acidic or too basic. The TDS was between 789 and 851 mg/l, which measures how much solid stuff is dissolved in the water. The alkalinity was between 219.5 and 274.3 mg/l, which shows how well the water can resist changes in pH. The calcium was between 61.9 and 74.8 mg/l, which is a mineral that is good for bones and teeth. The hardness was between 287.5 and 309.6 mg/l, which measures how much calcium and magnesium are in the water. Hard water can make soap less effective and leave deposits on pipes and appliances. The chloride was between 241.9 and 262.9 mg/l, which is a salt that can affect the taste of the water. The sulphate was between 39.8 and 59.6 mg/l, which is another salt that can also affect the taste of the water. The fluoride was between 0.21 and 0.36 mg/l, which is a chemical that can prevent tooth decay. The nitrate was <5 mg/l, which is a nutrient that can come from fertilizers, animal waste, or sewage. High levels of nitrate can be harmful to babies and pregnant women. All these things were within the safe limits of drinking water standards IS 10500:2012 at all locations. The water was also tested for heavy metals, which are metals that can be toxic to humans and animals. Only iron and zinc were found, and they were also within the safe limits of drinking water standards IS 10500:2012.

3.4.7. Surface Water Quality

Table 3-10: Surface Water Sampling Location

Location Name	Code	Distance	Direction	Latitude	Longitude
Yamuna River	SW1	0.3	S	28° 7' 10.197" N	77° 29' 13.772" E
Ponds Near Chandhat	SW2	4.1	W	28° 7' 13.542" N	77° 26' 40.610" E
Ponds Near Sultanpur	SW3	4.7	SW	28° 4' 12.915" N	77° 27' 54.794" E
Ponds Near Gharbara	SW4	4.6	SSE	28° 3' 59.438" N	77° 30' 47.845" E
Ponds Near Mirpur Kachh	SW5	2.8	ENE	28° 7' 53.263" N	77° 31' 1.225" E

Table 3-11: CPCB Water Quality Criteria

Designated Best Use	Class*	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
	C	Total Coliforms Organism MPN/100ml shall be 5000 or less

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Designated Best Use	Class*	Criteria
Drinking water source after conventional treatment and disinfection		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

* **Class- Water Quality Class Defined by CPCB**

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	SW-4	SW-5	CPCB Standards*	
								IS 2296	Class
1	Turbidity	NTU	21.6	26.1	18.9	21.4	24.9	\$	\$
2	pH	--	7.54	8.14	7.36	7.50	7.41	6.5 – 8.5	Class A
3	Temperature	0C	25.1	25.6	25.9	26.1	25.1	\$	\$
4	Total Suspended Solids	mg/l	61	57	66	49	52	\$	\$
5	Conductivity	µS/cm	1908	1992	1835	1985	1899	\$	\$
6	Total Dissolve Solids	mg/l	1149	1184	1109	1187	1142	\$	\$
7	Alkalinity as CaCO ₃	mg/l	459.6	498.5	429.4	471.6	466.7	\$	\$
8	Total Hardness as CaCO ₃	mg/l	676.7	684.9	626.7	669.7	620.9	\$	\$
9	Calcium as Ca	mg/l	189.4	192.7	186.2	199.8	178.6	\$	\$
10	Magnesium as Mg	mg/l	49.6	49.6	39.4	41.6	42.6	\$	\$
11	Sodium	mg/l	71	85	77	89	87	\$	\$
12	Potassium	mg/l	6	5	4	3	5	\$	\$
13	Bicarbonate	mg/l	459.6	498.5	429.4	471.6	466.7	\$	\$
14	Chloride as Cl	mg/l	214.9	219.6	211.8	221.9	203.4	\$	\$
15	Sulphate as SO ₄	mg/l	123.6	125.7	131.4	136.4	122.8	\$	\$
16	Nitrate as NO ₃	mg/l	25.6	21.9	19.6	24.9	27.4	\$	\$
17	Total Carbon	mg/l	<1	<1	<1	<1	<1	\$	\$
18	Flouride as F	mg/l	0.71	0.64	0.57	0.64	0.71	1.5	\$
19	Phenolic compound as C ₆ H ₅ OH	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	\$
20	Nickel	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	\$	\$
21	Arsenic	mg/l	<0.020	<0.020	<0.020	<0.020	<0.020	\$	\$
22	Cadmium	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	\$	\$
23	Chromium as Cr+6	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	\$	\$
24	Iron	mg/l	0.54	0.49	0.69	0.7	0.8	\$	\$
25	Lead	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	\$	\$
26	Zinc	mg/l	2.9	2.7	3.6	2.1	3.2	5	Class A

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Parameters	Unit	SW-1	SW-2	SW-3	SW-4	SW-5	CPCB Standards*	
								IS 2296	Class
27	Dissolve Oxygen	mg/l	6.3	6.5	6.1	6.1	6	\$	\$
28	COD	mg/l	126	129	131	122	119	3	Class A
29	BOD, 27°C 3 days	mg/l	39.4	41.8	36.9	42.7	32.6	500	Class B

***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 & 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 7.36 to 8.14 denotes water meeting to the Class A which is defined for Drinking Water Source without conventional treatment but after disinfection. Dissolved Oxygen of the sources was varying denotes water quality meeting to Class A which is defined for Drinking Water Source without conventional treatment but after disinfection & Class B which denotes as Outdoor bathing (Organized), Class B which denotes as Outdoor bathing (Organized) & Class C (Drinking water source after conventional treatment and disinfection). Total Coliform is meeting to Class A which is defined for Drinking Water Source without conventional treatment but after disinfection & Class B which denotes as Outdoor bathing (Organized) & Class B which denotes as Outdoor bathing (Organized).

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	-

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Season / Month		Rainfall (mm)	Temperature (°C)		Humidity (%)		Wind	
			Max	Min	08:30 hrs.	17:30 hrs.	Speed (kmph)	Direction
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://imd pune.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 pre-monsoon season (March to May 2024). 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

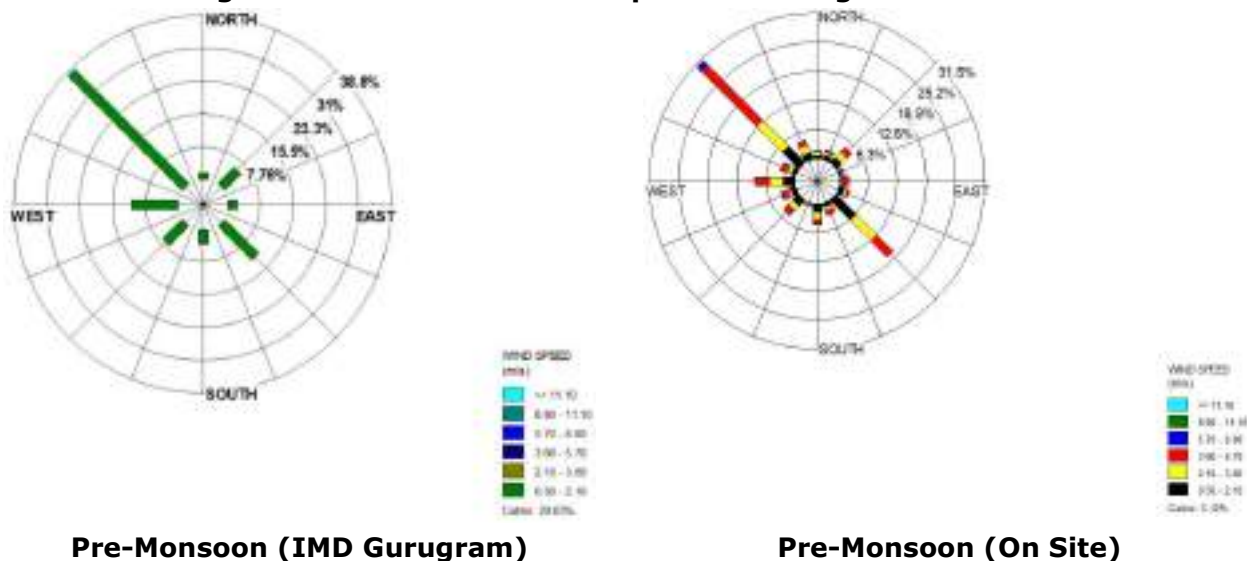
Months	Temperature (°C)			Relative Humidity (%)			Average Wind Speed		Rainfall
	Max.	Min.	Average	Max.	Min.	Average	m/s	kmph	mm
March	36.9	14.4	26.8	77.4	45.5	61.5	2.2	7.9	0.0
April	40.6	20.7	31.6	79.7	46.0	62.3	2.8	9.9	0.0
May	45.3	22.2	32.9	79.2	47.7	63.8	3.3	12.0	0.0
Average	40.9	19.1	30.4	78.8	46.4	62.5	2.8	9.9	0.0

The maximum temperature recorded during the study period was 45.3°C in the month of May and the minimum temperature was 14.4°C in the month of March. The highest RH found in the study area was 79.7% in the month of April, while minimum monthly average RH found 45.5% in the month of March. The average wind speed recorded was 2.8 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 3.1**.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Figure 3.10: Wind Pattern as per IMD Gurugram & Onsite



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 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.

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.

Table 3-15: Ambient Air Monitoring Locations

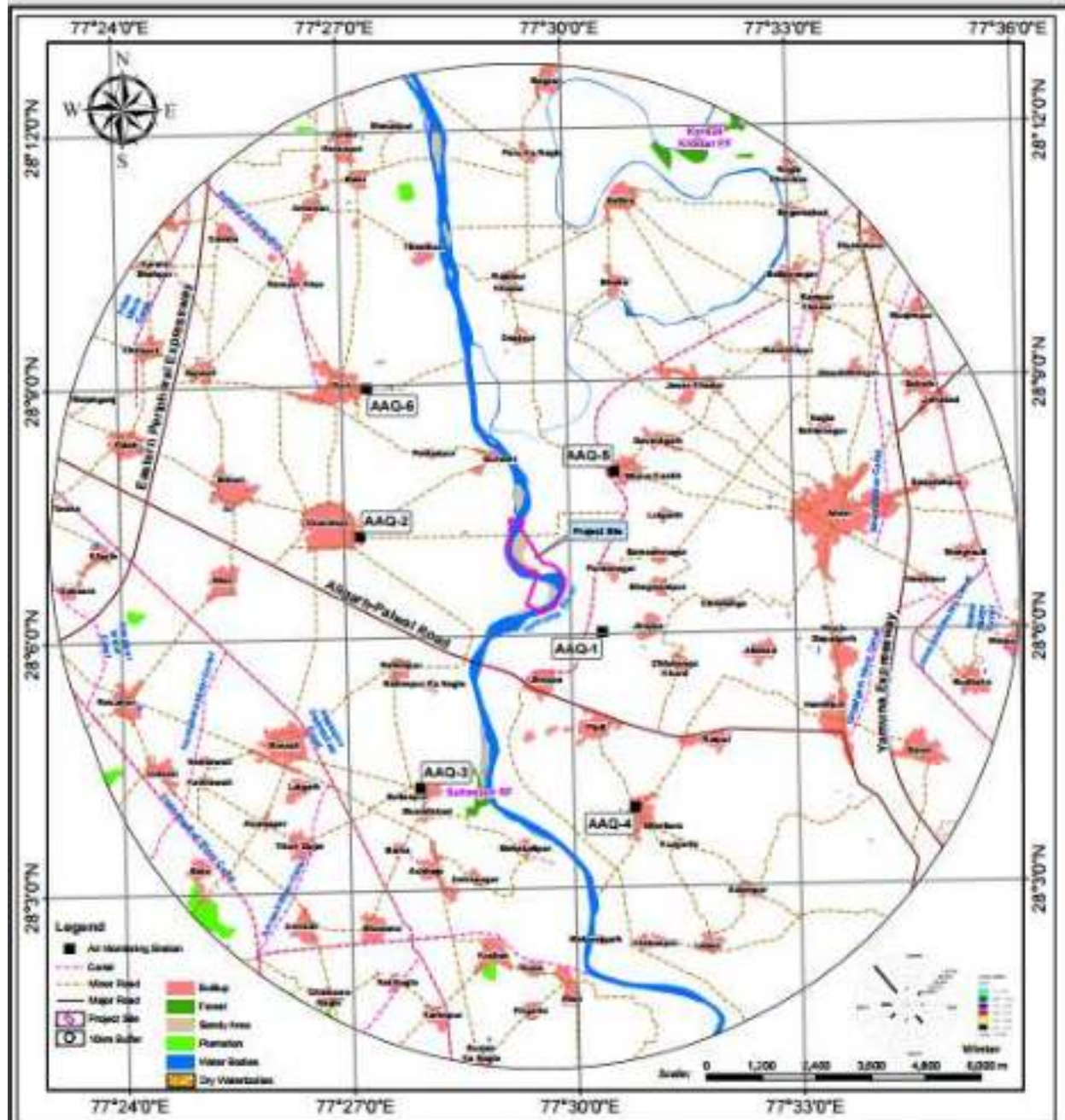
S. No.	Location Name	Code	Distance (km)	Direction	Latitude	Longitude
1	Jhuppa	AAQ-1	1.3	ESE	28° 6' 01.295" N	77° 30' 25.295" E
2	Chandhat	AAQ-2	3.3	W	28° 7' 12.694" N	77° 27' 12.756" E
3	Sultanpur	AAQ-3	4.6	SW	28° 4' 13.366" N	77° 27' 56.659" E

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Location Name	Code	Distance (km)	Direction	Latitude	Longitude
4	Gharbara	AAQ-4	4.7	SSE	28° 3' 56.226" N	77° 30' 48.606" E
5	Mirpur Kachh	AAQ-5	2.2	ENE	28° 7' 55.935" N	77° 30' 36.617" E
6	Gori	AAQ-6	4.2	NW	28° 8' 57.209" N	77° 27' 19.897" E

Figure 3.11: Ambient Air Monitoring Locations



DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

3.6.2. Air Quality of Study Area

Consolidated values of ambient air quality are given in Table 3.16. The test report and monitoring photographs are 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/m ³									0.1 mg/m ³					
AAQ standard (CPCB) for Industrial, Residential & other Areas				100 µg/m ³			60 µg/m ³			80 µg/m ³			80 µg/m ³			4 mg/m ³		
AAQ standard (CPCB) for Sensitive Areas				100 µg/m ³			60 µg/m ³			80 µg/m ³			80 µg/m ³			4 mg/m ³		
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	Jhuppa	24	R	59	90	89	21	31	31	7.2	11.8	11.7	10.1	16.5	16.3	0.89	1.33	1.31
AAQ-2	Chandhut	24	R	68	82	82	24	29	29	7.1	11.1	11.1	10.1	15.5	15.5	0.89	1.19	1.18
AAQ-3	Sultanpur	24	R	58	90	89	29	39	38	10.5	14.9	14.9	13.7	19.4	19.3	1.05	1.50	1.47
AAQ-4	Gharbara	24	R	63	83	82	22	29	29	11.2	14.5	14.3	14.6	18.9	18.6	0.92	1.19	1.19
AAQ-5	Mirpur Kachh	24	R	60	77	76	21	27	27	7.4	11.6	11.6	10.8	15.1	15.0	0.72	1.13	1.11
AAQ-6	Gori	24	R	60	73	73	21	25	25	6.5	9.5	9.4	10.2	14.3	14.0	0.75	1.02	1.01

** 24 hourly or 8 hourly or 1 hourly monitored value, as applicable shall be complied with 98% 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/m ³)	Free Silica (%)	Ca (µg/m ³)	Mg (µg/m ³)	Ni (µg/m ³)	Pb (µg/m ³)
Jhuppa	10/03/2024	82.9	2.1	1.42	0.61	<0.5	0.18
Chandhut	04/03/2024	70.2	1.8	1.33	0.44	<0.5	0.15
Sultanpur	26/03/2024	89.0	2.2	1.16	0.31	<0.5	0.09
Gharbara	18/04/2024	77.5	1.9	1.66	0.58	<0.5	0.11
Mirpur Kachh	20/04/2024	74.2	1.9	1.14	0.49	<0.5	0.18
Gori	13/05/2024	72.6	1.8	1.49	0.55	<0.5	0.18

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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INTERPRETATION

- ✓ **Particulate Matter:** PM₁₀ varying from 73 µg/m³ to 89 µg/m³. PM_{2.5} was observed 25 µg/m³ to 38 µg/m³.
- ✓ **Gaseous Pollutants:** SO₂ was varying from 9.4 µg/m³ to 14.9 µg/m³. NO_x was observed 14.0 µg/m³ to 19.3 µg/m³ in study area. CO was observed from 1.01 mg/m³ to 1.47 mg/m³ 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

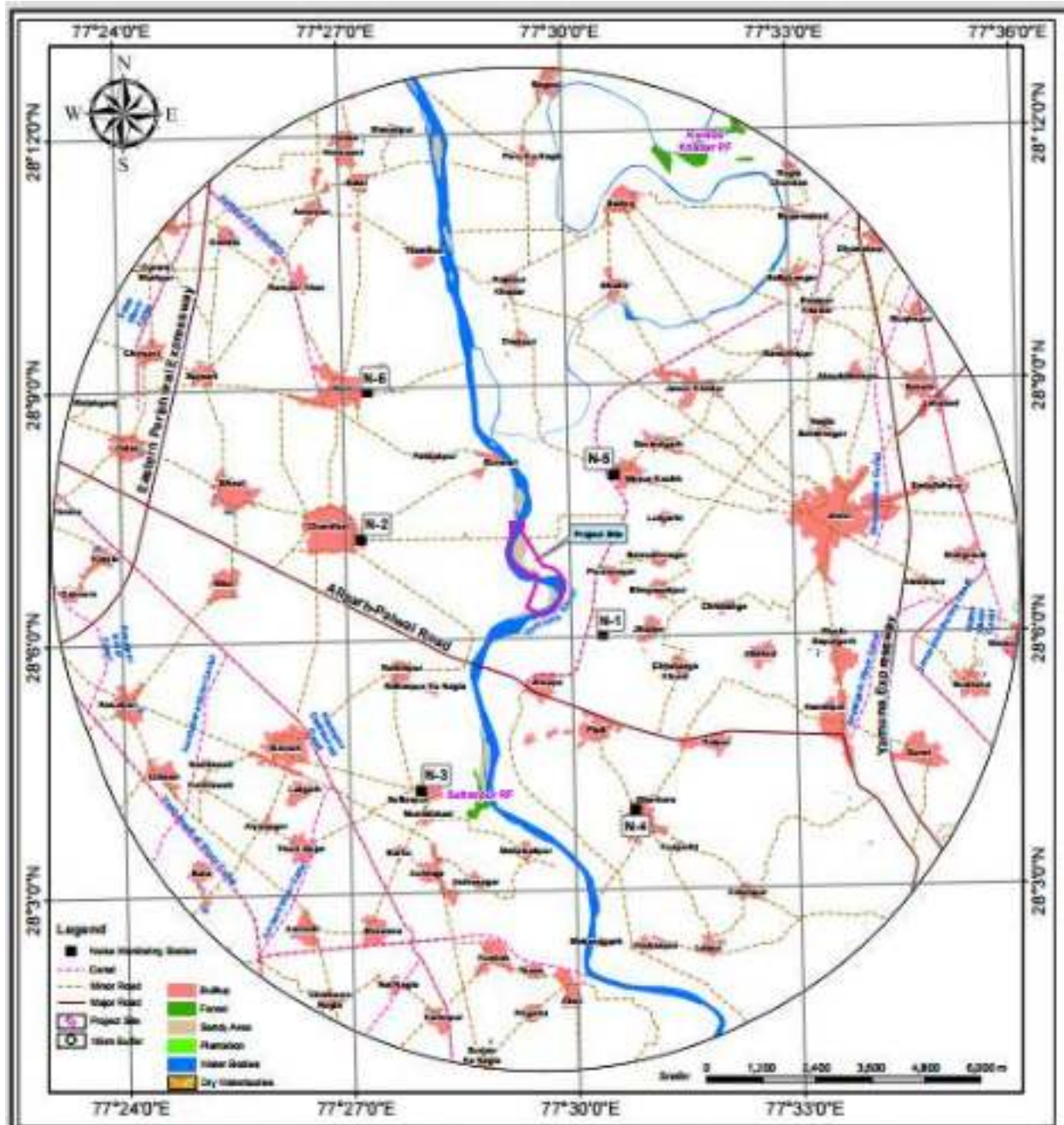
S. No.	Location Name	Location Code	Distance (km)	Direction	Latitude	Longitude
1	Jhuppa	N-1	1.3	ESE	28° 6' 1.295" N	77° 30' 25.295" E
2	Chandhat	N-2	3.3	W	28° 7' 12.694" N	77° 27' 12.756" E
3	Sultanpur	N-3	4.6	SW	28° 4' 13.366" N	77° 27' 56.659" E

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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S. No.	Location Name	Location Code	Distance (km)	Direction	Latitude	Longitude
4	Gharbara	N-4	4.7	SSE	28° 3' 56.226" N	77° 30' 48.606" E
5	Mirpur Kachh	N-5	2.2	ENE	28° 7' 55.935" N	77° 30' 36.617" E
6	Gori	N-6	4.2	NW	28° 8' 57.209" N	77° 27' 19.897" 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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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
Jhuppa	Residential	AN-1	55	57.4	41.9	51.6	45	40.2	32.9	36.4
Chandhat		AN-2	55	58.1	37.0	51.4	45	36.4	29.5	33.4
Sultanpur		AN-3	55	54.1	40.1	50.8	45	38.5	30.6	34.7
Gharbara		AN-4	55	55.9	39.5	51.4	45	38.4	30.6	34.7
Mirpur Kachh		AN-5	55	58.7	39.4	51.7	45	35.6	28.6	33.1
Gori		AN-6	55	57.6	38.4	51.8	45	37.2	30.9	34.7

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

The Sound Pressure Level recorded during the daytime on all locations varies from 50.8 dB(A) to 51.8 dB(A) & in time it varies between 33.1 dB(A) to 36.4 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

S. No.	Aspect	Mode of Data collection	Parameters monitored	Remarks
1.	Terrestrial Biodiversity	By field survey	Floral and Faunal diversity	<p>For Floral Diversity: Random survey, sapling survey/forest inventory, walking transects, collection and identification with the help of relevant literature.</p> <p>For Faunal Diversity: direct and indirect sampling, walking transects, point sampling and nest sampling etc.</p>

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Aspect	Mode of Data collection	Parameters monitored	Remarks
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 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. Forest NOC has been issued by the Office of Divisional Forest Officer, Palwal Forest Division, Palwal vide reference no. 3693 dated 12.12.2023 which confirms project site is not part of any reserve forest or protected forest.

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

S. No.	Accessibility	Description	Distance (km)	Direction
1	Highway/ Road/ Kacha Rasta	NH-2	14.7	WSW
		Aligarh Palwal Road	7.7	ESE
2	Railway Stations	Rundhi Railway Station	14.3	WSW
3	Religious	Atma Ram Mandir	8.1	SSE
		Siddh baba Temple	7.2	SSW
4	Airport	Jewar Airport	16.6	NE
5	Hospitals	Govt Hospital Sihol	5.6	WNW
		Santosh Hospital tappal	11.1	SE
6	Institutional Buildings	Govt Sr. Sec. School Chandhut	4.1	W
		Dayanand Public School Chandhut	4.6	W
7	Post Office	Post Office Chandhut	4.1	WSW
8	Densely populated/ Settlements/ Habitat	Chandhut	3.7	WSW
9	Interstate Boundary	Haryana-Uttar Pradesh	0.1	WNW
10	Waterbody	Within Project Site Yamuna River	0.0	NW
		Amrauli Minor Canal	7.6	SW
		Hasanpur Distributary Canal	5.6	SW
		Left Bata drain	7.2	SW
		Bela Minor Canal	10.8	SW
		Hodal Distributary Canal	11.5	SW

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Accessibility	Description	Distance (km)	Direction
		Ladiyaka Minor Canal	9.7	SW
		Silauthi Minor Canal	13.3	WSW
		Nandabara Minor Canal	6.7	WSW
		Rampur Distributary	5.3	WNW
		Kithwari Drain	11.6	WNW
		Rasulpur Minor Canal	9.3	W
		Chajjunagar Minor Canal	10.9	WSW
		Kherla Drain	10.4	W
		Hoshangabad Minor Canal	9.5	WSW
		Siwara Minor Canal	8.3	ENE
		Bajauta Distributary Canal	11.4	E
		Waina Minor Canal	9.8	ESE
		Khaira Nala	6.6	ESE
		Dehar Nala	8.2	SE
		Jewar Distributary Canal	14.6	SE
		Dhundar Nala	14.3	SE
		Likhi Minor Canal	13.4	SSW
		Jair Nala	3.1	N
		Karauli Minor Canal	12.2	SSW
		Kishorpur Minor	12.3	NE
		Khwajapur Minor	11.5	ENE
		Pelak Minor	9.1	NW
		Karoli Minor	10.5	NE
		Diyanatpur Minor	7.3	NE
11	Forest	Sultanpur RF	3.6	SSW
		Karauli Khadar PF	8.2	NNE
12	Seismic Zone	Zone IV High Damage Risk Zone		

Source: SOI Toposheet (G43F5, G43F9, H43X7, H43X8, H43X11 & H43X12) & Google References.

3.8.3. Forest Cover in Palwal District

The forest type found in the study area is Dry Deciduous Type Forest as per Champion and Seth Classification (1968). The recorded forest cover of the state is 1559 sq. km, which is 3.53% of its geographical area. The reserved, protected, and unclassified forests are 249 sq. km, 1158 sq. km and 152 sq. km respectively of the recorded forest area. (India State of Forest Report, 2021).

Table 3-23: Forest cover of State and Project Affected District

District / State	Geographical Area (km ²)	Forest (km ²)			Total (km ²)	% of GA
		Very Dense	Mod. Dense	Open		
Palwal	1,359	0.00	1.94	11.62	13.56	1.00
Haryana	44212	28	445.38	1130	1603.48	3.63

Source: ISFR, 2021

The proposed mine area is not falling under any reserve forest. However, some forest areas are in buffer area of proposed mine lease area. The details of such forests area as follows:

Table 3-24: Reserve Forest Area details around the proposed Mine Site

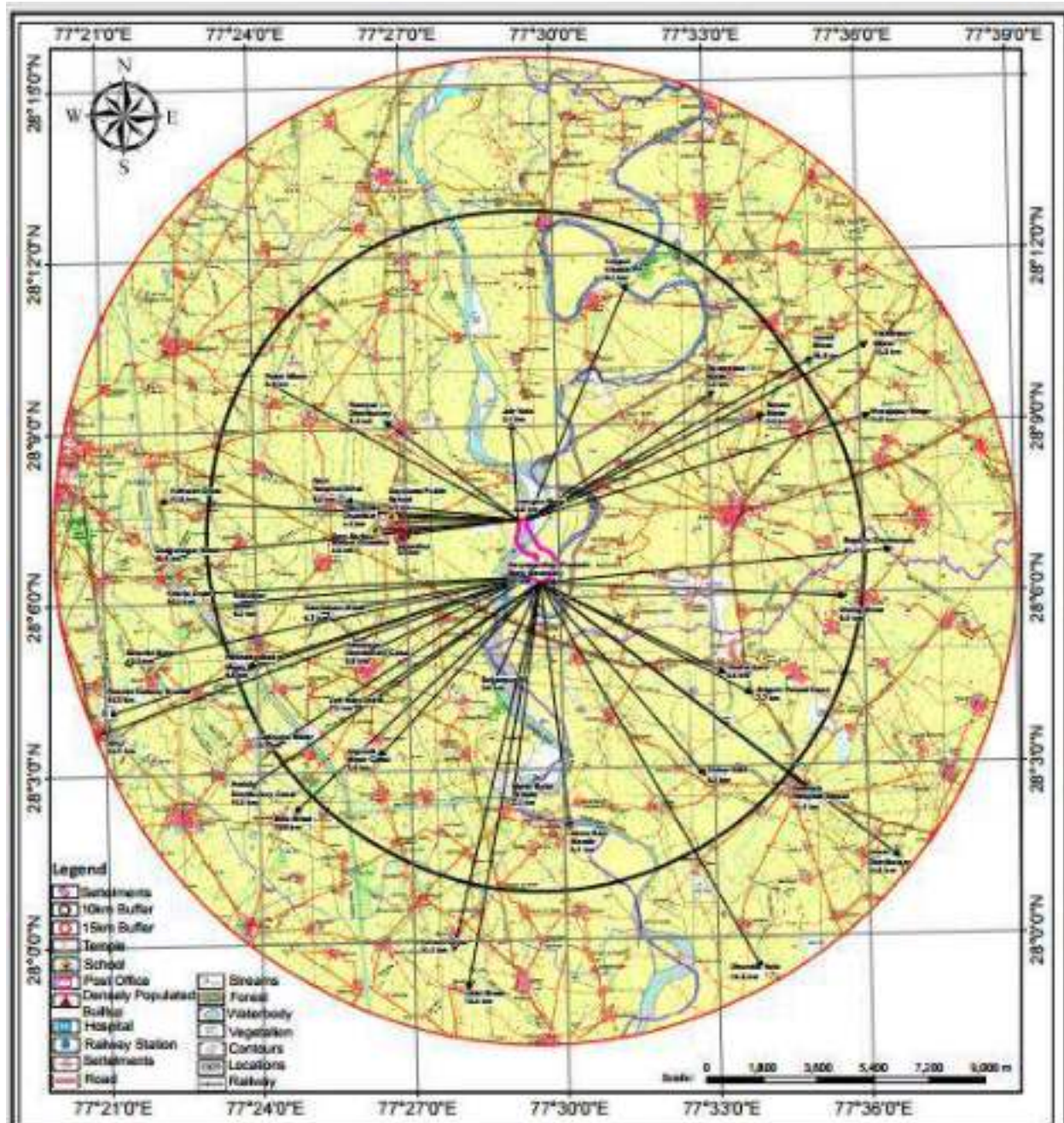
S. No.	Name of Forest	Distance from mine area	Direction from Mine Area
1	Sultanpur RF	3.6 Km	SSW
2	Karauli Khadar PF	8.2 Km	NNE

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

The proposed mine area is neither part nor falling within 10 km radius of any National Park / Wildlife Sanctuary / other protected area under Wildlife (Protection) Act, 1972.

Figure 3.13: Environment Sensitivity Map (15 km Buffer) of Proposed Site



3.8.4. 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.:

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Core Zone: Project Site i.e., Chandhut (South) 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- Chandhut South, 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-2023.

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

3.8.5. Floral Ecology

As the core zone of study area is riverbed, hence large trees were not found. Shrubs, herbs, and grasses were observed at shores of river. The buffer zone of the study area mainly comprises agricultural field. The large trees were found within agriculture fields, near habitation and in the

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

forest, area falling within the buffer zone of study area. Shrubs, herbs, grasses and climbers were also observed in the buffer zone of study area.

During the survey, no rare, endangered or threatened species of flora was observed in the study area. The floral inventory is presented in table below:

Table 3-25: Floral Checklist of Buffer Zone

S. No.	Scientific Name	Local Name	Family
Trees			
1	<i>Acacia nilotica</i>	Kikar	Fabaceae
2	<i>Acacia catechu</i>	Khair	Fabaceae
3	<i>Aegle marmelos</i>	Bel	Rutaceae
4	<i>Albizia lebbek</i>	Kala siris	Fabaceae
5	<i>Alstonia scholaris</i>	Saptaparni	Apocyanaceae
6	<i>Ailanthes excelsa</i>	Arusa	Simaroubaceae
7	<i>Anthocephalus cadamba</i>	Kadamb	Rubiaceae
8	<i>Azadiracta indica</i>	Neem	Meliaceae
9	<i>Bauhinia purpurea</i>	Kachnar	Caesalpiniaceae
10	<i>Bombax ceiba</i>	Semal	Malvaceae
11	<i>Cassia fistula</i>	Amaltas	Fabaceae
12	<i>Callistemon viminalis</i>	Bottle Brush	Myrtaceae
13	<i>Dalbergia sissoo</i>	Shisham	Fabaceae
14	<i>Delonix regia</i>	Gulmohar	Fabaceae
15	<i>Eucalyptus spp</i>	Safeda	Myrtaceae
16	<i>Ficus benghalensis</i>	Bargad	Moraceae
17	<i>Ficus religiosa</i>	Pipal	Moraceae
18	<i>Ficus glomerata</i>	Gular	Moraceae
19	<i>Mangifera indica</i>	Aam	Anacardiaceae
20	<i>Melia azedarach</i>	Bakain	Meliaceae
21	<i>Morus alba</i>	Toot	Moraceae
22	<i>Pongamia pinnata</i>	Karanj	Fabaceae
23	<i>Prosopis juliflora</i>	Khejri	Fabaceae
24	<i>Polyalthia longifolia</i>	False Ashok	Annonaceae
25	<i>Syzygium cumini</i>	Jamun	Myrtaceae
26	<i>Tamarindus indica</i>	Imli	Caesalpiniaceae
27	<i>Terminalia arjuna</i>	Arjun	Combretaceae
28	<i>Ziziphus mauritiana</i>	Ber	Rhamnaceae
Shrubs and Herbs			
1	<i>Abutilon indicum</i>	Kanghi	Malvaceae
2	<i>Achyranthes aspera</i>	Chirchita	Amaranthaceae
3	<i>Aerva tomentosa</i>	Bui	Amaranthaceae
4	<i>Agave americana</i>	Gwarpatha	Amaryllidaceae
5	<i>Bougainvillea glabra</i>	Bougainvillia	Nyctaginaceae
6	<i>Calotropis procera</i>	Aak	Asclepiadaceae
7	<i>Cassia tora</i>	Panwar	Caesalpiniaceae
8	<i>Cleome viscosa</i>	Bagra	Capparaceae
9	<i>Datura metel</i>	Dhatura	Solanaceae
10	<i>Euphobia hirta</i>	Dudhi	Euphorbiaceae
11	<i>Lantana camara</i>	Panchpuli	Verbenaceae
12	<i>Opuntia dillenii</i>	Nagphani	Cactaceae
13	<i>Parthenium hysterophorus</i>	Gajar Ghass	Asteraceae

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Scientific Name	Local Name	Family
14	<i>Ricinus communis</i>	Arandi	Euphorbiaceae
15	<i>Nerium oleander</i>	Kaner	Apocynaceae
16	<i>Solanum nigrum</i>	Makoi	Solanaceae
17	<i>Xanthium strumarium</i>	Chota gokhru	Asteraceae
Grasses, Hedges and Climbers			
1	<i>Apluda mutica</i>	Tachula	Poaceae
2	<i>Brachiaria ramosa</i>	Makra	Poaceae
3	<i>Cuscuta reflexa</i>	Amarbel	Cuscutaceae
4	<i>Cenchrus ciliaris</i>	Anjan grass	Poaceae
5	<i>Cyperus rotundus</i>	Dilla	Cyperaceae
6	<i>Cynodon dactylon</i>	Doob	Poaceae
7	<i>Digitaria ciliaris</i>	Wild Crab grass	Poaceae
8	<i>Erianthus munja</i>	Kana	Poaceae
9	<i>Heteropogon contortus</i>	Black Spear Grass	Poaceae
10	<i>Saccharum munja</i>	Moonj	Poaceae
11	<i>Tinospora cordifolia</i>	Giloy	Menispermaceae
12	<i>Vetiveria zizanioides</i>	Khas	Poaceae

Source: Study done by Parivesh Environmental Engineering Services

Plants of Economic Importance: Several plants found in the study area possess importance as medicine & other allied uses. The details of such plants are as follows.

Table 3-26: Plants of Medicinal Importance & Other Allied Uses

S. No.	Botanical Name	Common Name	Family Name	Part used	Medicinal use
1	<i>Abutilon indicum</i>	Kanghi	Malvaceae	Roots	Roots decoction is taken with milk or honey orally for long life span with strength
				Seeds	Seeds powder is taken orally as a Constipation remedy
				Leaves	Leaves Powder is taken orally with cow milk to cure diabetes
2	<i>Ailanthus excelsa</i>	Ardu	Simaroubaceae	Stem	Stem Juice mixed with sugar or honey is given orally to birth control
				Bark	Stem bark Decoction is given orally mixed with honey to treat Dysentery
3	<i>Albizia lebbek</i>	Safed Siris	Leguminosaceae	Leaf	Leaf extract are helpful in Bites and stings from venomous animals, ear pain and coughing
				Bark	Bark extract is helpful in Blood purification.
				Seeds	Seeds extract are used in Diarrhoea and Dysentery

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Botanical Name	Common Name	Family Name	Part used	Medicinal use
4	<i>Azadirachta indica</i>	Neem	Meliaceae	Leaf	Leaf extract cures Leprosy, intestinal helminthiasis, respiratory disorders, constipation, rheumatism, chronic syphilitic sores and ulcer
				Flower	Flowers extracts are useful in Bile suppression, elimination of intestinal worms and phlegm
				Fruit	Fruit is taken for curing Piles, intestinal worms, urinary disorder, phlegm, eye problem, diabetes, wounds and leprosy
				Bark	Analgesic and antipyretic
5	<i>Cassia fistula</i>	Amaltas	Caesalpiaceae	Seeds	Mild laxative
				Leaf	Insect bites, swelling, rheumatism and facial paralysis
				Roots	Tonic, an astringent, febrifuge and strong purgative, migraine and dysentery
6	<i>Cynodon dactylon</i>	Doob	Poaceae	Whole plant	fodder
7	<i>Cassia tora</i>	Chakor	Caesalpiaceae	leaves	used as vegetables
8	<i>Datura metel</i>	Dhatura	Solanaceae	Seeds	Its 2-3 seeds should be taken daily to cure headache
				Leaves	Crushed leaves of Datura are used in treatment of bones diseases and scrotum swelling Pulp of its leaves is used for a scorpion sting
				Seeds	Its seeds crushed with water and used to treat for skin diseases
9	<i>Dalbergia sissoo</i>	Shisham	Leguminosae	Leaf	Gonorrhoea
				Roots	Astringent
				Wood	Leprosy and to allay vomiting
10	<i>Ficus benghalensis</i>	Bargad	Moraceae	Bark	Dysentery, diarrhoea, leucorrhoea, nervous disorders and reduces blood sugar in diabetes
				Leaf	Leaf extract is applied externally to abscesses

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Botanical Name	Common Name	Family Name	Part used	Medicinal use
					and wounds to promote suppuration.
				Aerial Roots	Pimples, leucorrhoea and osteomalacia
				Twigs	Strengthen gums and teeth
				Latex	Rheumatism, haemorrhoids, gonorrhoea, cracks of the sole and skin diseases
11	<i>Ficus glomerata</i>	Gular	Moraceae	Bark	Diabetes, bronchitis, dry cough, dysentery, diarrhoea etc.
				Leaf	Diarrhoea, dyspepsia, haemorrhages and obesity
				Fruit	Leprosy, blood diseases, fatigue, leucoderma etc.
12	<i>Mangifera indica</i>	Aam	Anacardiaceae	Roots and Bark	Anti-syphilitic, anti-inflammatory, leucorrhoea, wounds, ulcers and vomiting.
				Leaf	Cough, hiccup, burning sensation, hemorrhages, diarrhoea and dysentery
				Flower	Anorexia, dyspepsia, diarrhoea and anaemia etc
				Ripe Fruit	Anorexia, dyspepsia, cardiopathy, haemorrhages from uterus, lungs and intestine and anaemia.
				Unripe Fruit	Dysentery ophthalmia, and urethrorrhagia
13	<i>Melia azedarach</i>	Bakayan	Meliaceae	Leaves	5 ml juice of its leaves is used to remove barriers of menstruation
				Seeds	Its seeds crushed with mustard seed are applied on joints to relief arthritis
14	<i>Ricinus communis</i>	Arandi	Euphorbiaceae	Seeds	used for oil extraction
15	<i>Saccharum munja</i>	Munj	Poaceae	Whole plant	for making rope
16	<i>Tamarindus indica</i>	Imli	Leguminosae	Fruit	used as food
17	<i>Terminalia arjuna</i>	Arjun	Combretaceae	Leaf, Stem Bark	Medicinal use

Source: Primary Survey and Secondary Data

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Agriculture: As the study area mainly comprises agriculture land, various crops are grown in the area. The major crops are paddy, jowar, bajra and makai in kharif seasons, while that of Rabi seasons crops are wheat, barley, mustard, toor, mung, chana, pea and barseem. The cultivation in this area is highly mechanized and there are profound facilities for irrigation through canals and deep tube wells. The farmers also use both chemical and bio-fertilizer in adequate quantity.

Table 3-27: Plants of Medicinal Importance & Other Allied Uses

S. No	Scientific Name	Common Name	Family	Season
1	<i>Brassica nigra</i>	Mustard	Brassicaceae	Rabi
2	<i>Cajanus cajan</i>	Toor	Fabaceae	Rabi
3	<i>Cicer arietinum</i>	Chana	Fabaceae	Rabi
4	<i>Hordeum vulgare</i>	Barley	Poaceae	Rabi
5	<i>Pisum sativum</i>	Pea	Fabaceae	Rabi
6	<i>Trifolium alexandrinum</i>	Berseem	Fabaceae	Rabi
7	<i>Triticum aestivum</i>	Wheat	Poaceae	Rabi
8	<i>Vigna spp.</i>	Mung	Fabaceae	Rabi
9	<i>Oryza sativa</i>	Rice / Paddy	Poaceae	Kharif
10	<i>Pennisetum glaucum</i>	Bajra/Pearlmillet	Poaceae	Kharif
11	<i>Sorghum bicolor</i>	Jowar	Poaceae	Kharif
12	<i>Zea mays</i>	Maize/Makai	Poaceae	Kharif

Source: Primary Survey and Secondary Data

3.8.6. 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: The presence of mammals, avifauna and herpetofauna were observed by using conventional methods like transect walks during the daytime. Amphibians were observed in the river and other water bodies. Butterflies were also observed in the study area. As the study area consists of agricultural lands, built-up areas, river, roads, canals and drains etc. many species of fauna was seen. Domesticated animals were seen near inhabited areas while some wild animals were reported from agricultural fields, near river area and RF area. The presence of fauna species was also confirmed from the local inhabitants.

Table 3-28: Faunal Checklist of Buffer Zone

S. No.	Common Name	Scientific Name	Status/Schedule as per WPA, 1972
Mammals			
1.	Black Rat	<i>Rattus rattus</i>	Schedule-V
2.	Common Mongoose	<i>Herpestes edwardsii</i>	Schedule-I
3.	Five Striped Palm Squirrel	<i>Funambulus pennanti</i>	Schedule-IV
4.	Little Indian field mouse	<i>Mus booduga</i>	Schedule-V
5.	Bandar	<i>Macaca mulatta</i>	Schedule-II

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Common Name	Scientific Name	Status/Schedule as per WPA, 1972
6.	Bat	<i>Rousettus leschenaultia</i>	Schedule-V
7.	Common Langur	<i>Presbytis entellus</i>	Schedule-II
8.	Jungle Cat	<i>Felis chaus</i>	Schedule-I
9.	Asian House Shrew	<i>Suncus murinus</i>	Least Concern
10.	Common House Mouse	<i>Mus musculus</i>	Schedule-V
Amphibians			
11.	Indian pond frog	<i>Rana hexadactyla</i>	Schedule-IV
12.	Common Indian Toad	<i>Duttaphrynus melanostictus</i>	Not Listed
13.	Indian Bull Frog	<i>Hoplobatrachus tigerinus</i>	Schedule-IV
14.	Indian Skipper Frog	<i>Euphlyctis cyanophlyctis</i>	Schedule-IV
15.	Toad	<i>Bufo bufo</i>	Not Listed
16.	Indian Cricket Frog	<i>Rana limnocharis</i>	Schedule-IV
17.	Common Frog	<i>Rana tigrina</i>	Schedule-IV
Reptiles			
18.	House gecko	<i>Hemidactylus flaviviridis</i>	Common
19.	Brahminy skink	<i>Mabuya carinata</i>	Common
20.	Indian Cobra	<i>Naja naja</i>	Schedule-I
21.	Rat Snake	<i>Ptyas mucosa</i>	Schedule-I
22.	Garden Lizard	<i>Calotes versicolor</i>	Not Listed
23.	Common Indian Krait	<i>Bungarus caeruleus</i>	Schedule-IV
24.	Snake-eyed Lacerta	<i>Ophisops jerdonii</i>	Schedule-IV
25.	Common Indian Monitor	<i>Varanus benghalensis</i>	Schedule-I
Butterflies			
26.	White, orange tip	<i>Ixias marianne</i>	Common
27.	Lime butterfly	<i>Papilio demoleus</i>	Common
28.	Common crow	<i>Euploea core</i>	Common
29.	Common map	<i>Cyrestis thyodamas</i>	Common
30.	Common mormon	<i>Papilio polytes</i>	Common
31.	Common Grass Yellow	<i>Eurema hecabe</i>	Fairly Common
32.	Stripped Tiger	<i>Danaus genutia</i>	Common
33.	Danaid Egg Fly	<i>Hypolimnans misippus</i>	Common
34.	Common Bush Brown	<i>Mycalesis perseus</i>	Common
Aves			
35.	House Crow	<i>Corvus splendens</i>	Schedule-V
36.	Rock Pigeon	<i>Columba livia</i>	Common
37.	Jungle babbler	<i>Turdoides striatus</i>	Schedule-IV
38.	Common Myna	<i>Acridotheres tristis</i>	Schedule-IV
39.	Green bee-eater	<i>Merops orientalis</i>	Least Concern
40.	Indian roller	<i>Coracias benghalensis</i>	Schedule-IV
41.	Black Drongo	<i>Dicrurus macrocercus</i>	Schedule-IV
42.	Common swift	<i>Apus apus</i>	Schedule-IV
43.	Cattle Egret	<i>Bubulcus ibis</i>	Schedule-IV
44.	Little Egret	<i>Egretta garzetta</i>	Schedule-IV
45.	Pond heron	<i>Ardeola grayii</i>	Schedule-IV
46.	Red wattled lapwing	<i>Vanellus indicus</i>	Schedule-IV
47.	Spotted Dove	<i>Streptopelia chinensis</i>	Schedule-IV
48.	White Breasted Kingfisher	<i>Halcyon smyrnensis</i>	Schedule-IV
49.	Asian Koel	<i>Eudynamis scolopacea</i>	Schedule-IV

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Common Name	Scientific Name	Status/Schedule as per WPA, 1972
50.	Small Sun Bird	<i>Nectarinia minima</i>	Schedule-IV
51.	House Sparrow	<i>Passer domesticus</i>	Schedule-IV
52.	Red Vented Bulbul	<i>Pycnonotus cafer</i>	Schedule-IV
53.	Bank Myna	<i>Acridotheres ginginianus</i>	Schedule-IV
54.	Common Babbler	<i>Turdoides caudatus</i>	Schedule-IV
55.	Rose Ringed Parakeet	<i>Psittacula krameri</i>	Schedule-IV
56.	Baya	<i>Ploceus philippinus</i>	Schedule-IV
57.	Peafowl	<i>Pavo cristatus</i>	Schedule-I
58.	Red-wattled lapwing	<i>Vanellus indicus</i>	Schedule-IV
59.	Hoopoe	<i>Upupa epops</i>	Schedule-IV

Source: Primary Survey and Secondary Data

Endangered Species: As per the faunal survey data, a total of six species were found within the Schedule-I of Indian Wildlife (Protection) Act, 1972 which includes *Pavo cristatus* (Indian Peafowl), *Naja naja* (Indian Cobra), *Ptyas mucosa* (Rat Snake), *Varanus benghalensis* (Common Indian Monitor lizard), *Herpestes edwardsii* (Common Mongoose) and *Felis chaus* (Jungle Cat).

Conservation plan has been prepared and submitted to the PCCFWL, Haryana for further approval. We have proposed an amount 34.0 lakhs under wildlife conservation plan which is 2 % of project cost i.e., 2% of 17.0 crores. The approval letter will be issued on submission of amount asked by PCCFWL, Haryana.

Certain steps have been taken to conserve this 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.

3.8.7. Aquatic Ecology

The core zone of study area comprises the riverbed of Yamuna River. Besides, buffer zone of study area includes other tributaries, ponds, canals and drains. Aquatic biotic communities like Phytoplankton and Zooplanktons, Macrophytes and Fishes were studied.

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

Macrophyte: The presence of macrophytes were studied in rivers, marsh areas, ponds, canal and drains within the study area of the proposed site. An inventory of macrophytes is given in

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

the Table below. The commonly observed macrophytes were Water hyacinth, Behaya, Duckweed and Hogla.

Table 3-29: Macrophytes in Aquatic Habitats

S. No.	Common Name	Scientific Name	Growth Form
1.	Water hyacinth	<i>Eichhornea crassipes</i>	Floating
2.	Duck weed	<i>Lemna minor</i>	Floating
3.	Patera	<i>Typha domingensis</i>	Emergent
4.	Behaya	<i>Ipomoea aquatica</i>	Floating
5.	Garundi	<i>Alternanthera sessilis</i>	Floating
6.	Sedges	<i>Cyperus difformis</i>	Emergent
7.	Oriental Pepper	<i>Polygonum orientale</i>	Amphibious
8.	Barnyard Grass	<i>Echinochloa glabrescens</i>	Amphibious
9.	Jal kumbhi	<i>Pistia stratiotes</i>	Floating
10.	Lotus	<i>Nymphaea nancheli</i>	Emergent
11.	Harinkhuri	<i>Convolvulus arvensis</i>	Amphibious
12.	Patera	<i>Typha angustifolia</i>	Amphibious
13.	Mosquito fern	<i>Azolla pinnata</i>	Floating
14.	Jhangi	<i>Hydrilla verticillata</i>	Emergent

Source: Primary Survey and Secondary Data

Phytoplankton: The samples collected from the water bodies were analyzed for identification of phytoplankton and zooplankton. The details of phytoplankton and zooplankton are as follows.

Table 3-30: List of Phytoplankton from Study Area

Cyanophyceae	Bacillariophyceae	Chlorophyceae	Euglenophyceae
<i>Anabaena flosaque</i>	<i>Fragillaria sp.</i>	<i>Spirogyra sp.</i>	<i>Euglena sp.</i>
<i>Nostoc sp.</i>	<i>Synedra ulns</i>	<i>Chlorella vulgaris</i>	<i>Phacus sp.</i>
<i>Oscillatoria formosa</i>	<i>Navicula sp.</i>	<i>Microspora sp.</i>	<i>Trachelomonas sp.</i>
<i>Phormidium sp.</i>	<i>Cylindrotheca sp.</i>	<i>Ulothrix zonata</i>	
<i>Anacystis sp.</i>	<i>Cyclotella sp.</i>	<i>Gonium sp.</i>	
<i>Spirulina sp.</i>	<i>Achnanthes sp.</i>	<i>Zygnema sp.</i>	
<i>Microcystis sp.</i>	<i>Cymbella affinis</i>	<i>Oocystis crassa</i>	
<i>Gloeocapsa sp.</i>	<i>Nitzschia palea</i>	<i>Ankistrodesmus sp.</i>	

Source: Primary Survey and Secondary Data

Table 3-31: List of Zooplanktons from Study Area

Rotifers	Protozoa	Cladocera	Copepoda	Ostracoda
<i>Ascomorpha saltans</i>	<i>Amoeba proteus</i>	<i>Alona sp.</i>	<i>Cyclops sp.</i>	<i>Cyprinotus sp.</i>
<i>Anuraeopsis sp.</i>	<i>Arcella sp.</i>	<i>Bosmina longirostris</i>	<i>Diaptomus sp.</i>	<i>Cypris sp.</i>
<i>Brachionus bidentata</i>	<i>Centropyxis spp.</i>	<i>Ceriodaphnia sp.</i>	<i>Eucyclops agilis</i>	<i>Stenocypris sp.</i>
<i>Cephalodella forficula</i>	<i>Chlamydomonas minor</i>	<i>Chydorus Sphaericus</i>	<i>Mesocyclops sp.</i>	
<i>Colurella obtusa</i>	<i>Diffugia lebes</i>	<i>Daphnia laevis</i>	<i>Nauplius larvae</i>	
<i>Keratella sp.</i>		<i>Leydgia sp.</i>	<i>Thermocyclops sp.</i>	
<i>Polyarthra sp.</i>		<i>Moina brachiata</i>		

Source: Primary Survey and Secondary Data

Fishes: The fishes were observed in the rivers, canals and ponds. The pisciculture activities were observed very less and restricted only in the rivers and ponds of some villages. The fishes found were major carps like Rohu (*Labeo rohita*), Catla (*Catla catla*), Mrigal (*Cirrhinus mrigala*) and

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Kalbasu (*Labeo calbasu*). Other species found were *Puntius sophore*, *Wallago attu*, *Channa punctatus* etc. An inventory of fishes are as follows.

Table 3-32: List of Fishes from Study Area

S. No.	Scientific Name	Common Name	Family
Major Carps			
1	<i>Catla catla</i>	Katla	Cyprinidae
2	<i>Labeo rohita</i>	Rohu	Cyprinidae
3	<i>Cirrhinus mrigala</i>	Mrigal	Cyprinidae
4	<i>Labeo calbasu</i>	Kalbasu	Cyprinidae
Minor Carps			
5	<i>Puntius sophore</i>	Putti	Cyprinidae
6	<i>Labeo bata</i>	Bata	Cyprinidae
Cat Fishes			
7	<i>Wallago attu</i>	Lanchi	Siluridae
8	<i>Mystus seenghala</i>	Singhara	Bagridae
9	<i>Heteropneustes fossilis</i>	Singhi	Heteropneustidae
10	<i>Channa punctatus</i>	Girai	Channidae
11	<i>Clarias batrachus</i>	Mangur	Clariidae

Source: Primary Survey and Secondary Data

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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 3-33: 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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 3-34: 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%

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

3.9.2. Demography of Study Area

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

Table 3-35: 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	24132	145954	77747	68207	24070	6.0	877
2	Uttar Pradesh	Aligarh	Khair	7030	44817	23624	21193	7805	6.4	897
3		Gautam Budha Nagar	Jewar	12928	80247	42939	37308	12709	6.2	869
Total				44090	271018	144310	126708	44584	6.2	881

Figure 3.14: Population & gender Ration of Study Area

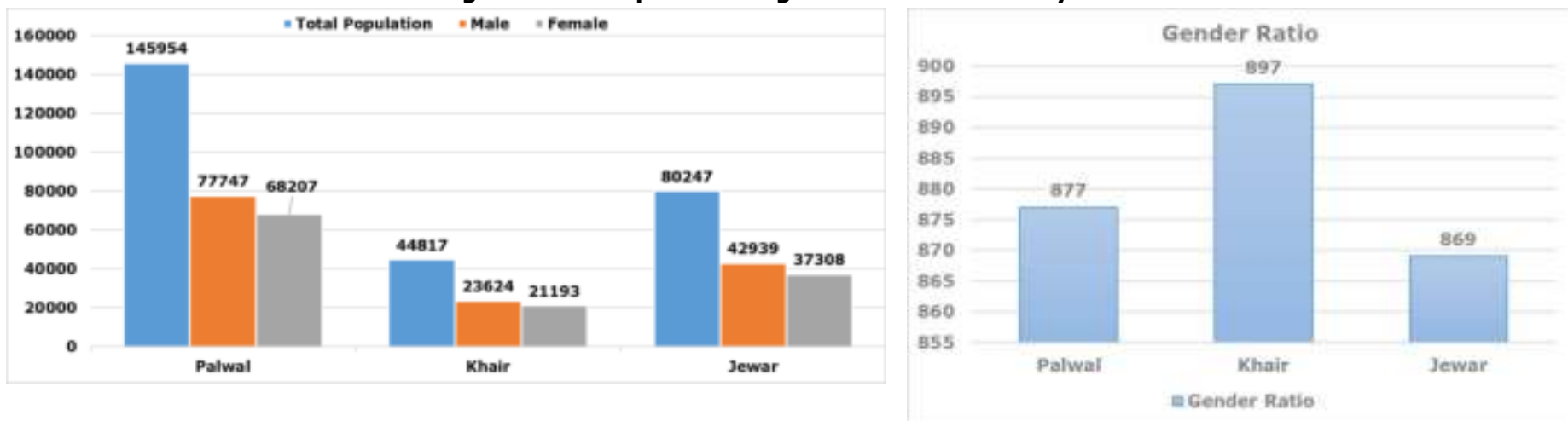


Table 3-36: Population Distribution of the Study Area

S. No.	State	Name of District	Name of the Block	Household	Total Population	SC Population	SC Male	SC Female	ST Population	ST Male	ST Female
1	Haryana	Palwal	Palwal	24132	145954	32291	17062	15229	0	0	0
2	Uttar Pradesh	Aligarh	Khair	7030	44817	10186	5341	4845	0	0	0
3		Gautam Budha Nagar	Jewar	12928	80247	19961	10675	9286	0	0	0
Total				44090	271018	62438	33078	29360	0	0	0

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Table 3-37: Literacy Rate of the Study Area

S. No.	State	Name of District	Name of the Block	Total Population	Total Literates	Male Literates	% of Male Literates	Female Literates	% of Female Literates	Overall Literacy Rate
1	Haryana	Palwal	Palwal	145954	86485	54945	63.53	31540	36.47	59.25
2	Uttar Pradesh	Aligarh	Khair	44817	23120	14838	64.18	8282	35.82	51.59
3		Gautam Budha Nagar	Jewar	80247	47303	29307	61.96	17996	38.04	58.95
Total				271018	156908	99090	63.22	57818	36.78	56.60

Figure 3.15: Literacy Rate & Worker Status of Study Area



Table 3-38: Occupational Structure of the Study Area

S. 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	145954	30479	13113	4927	812	11627	14938	100537
2	Uttar Pradesh	Aligarh	Khair	44817	9695	4181	2251	170	3093	3727	31395
3		Gautam Budha Nagar	Jewar	80247	18238	5950	3026	1304	7958	6965	55044
Total				271018	58412	23244	10204	2286	22678	25630	186976

Table 3-39: Education and Medical Facilities of the Study Area

S. No.	State	Name of District	Name of the Block	Govt Primary School	Govt Middle School	Govt Secondary School	Govt Senior Secondary School	Community Health Center (CHC)	Primary Health Center (PHC)	Primary Health Sub-center (PHSC)	Maternity Child Welfare Centre (MCW)
1	Haryana	Palwal	Palwal	53	31	14	8	0	5	17	0

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	State	Name of District	Name of the Block	Govt Primary School	Govt Middle School	Govt Secondary School	Govt Senior Secondary School	Community Health Center (CHC)	Primary Health Center (PHC)	Primary Health Sub-center (PHSC)	Maternity Child Welfare Centre (MCW)
2	Uttar Pradesh	Aligarh	Khair	8	6	3	3	1	1	1	3
3		Gautam Budha Nagar	Jewar	25	12	4	2	1	2	5	4
Total				86	49	21	13	2	8	23	7

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

Table 3-40: 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)	Tube-well (TW)
1	Haryana	Palwal	Palwal	48	31	8	47
2	Uttar Pradesh	Aligarh	Khair	3	3	1	3
3		Gautam Budha Nagar	Jewar	13	13	0	13
Total				64	47	9	63

Source Census Data, 2011

Table 3-41: Land Use Classification in the Study Area

S. No.	State	Name of District	Name of the Block	Forest Area (in Hectares)	Area under Non-Agricultural Uses (in Hectares)	Barren & Un-cultivable Land Area (in Hectares)	Permanent Pastures and Other Grazing Land Area (in Hectares)	Land Under Miscellaneous Tree Crops etc. Area (in Hectares)	Culturable Waste Land Area (in Hectares)	Fallows Land other than Current Fallows Area (in Hectares)	Current Fallows Area (in Hectares)	Net Area Sown (in Hectares)	Total Unirrigated Land Area (in Hectares)	Area Irrigated by Source (in Hectares)	Canals Area (in Hectares)	Wells/Tube Wells Area (in Hectares)	Tanks/Lakes Area (in Hectares)	Waterfall Area (in Hectares)	Other Source (specify) Area (in Hectares)
1	Haryana	Palwal	Palwal	0	3339	0	0	0	633	0	0	22636	0	22636	4992	16769	156	0	719
2	Uttar Pradesh	Aligarh	Khair	0	1188.53	0	59.95	254.06	331.2	52.57	347.963	7036.285	0	7036.29	283.85	4724.355	0	0	2028.08

PROPONENT: M/S APEX PROJECT WORKS, HARYANA

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET/EIA/2124/IA 0092(Rev.01))

PAGE 116

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	State	Name of District	Name of the Block	Forest Area (in Hectares)	Area under Non-Agricultural Uses (in Hectares)	Barren & Un-cultivable Land Area (in Hectares)	Permanent Pastures and Other Grazing Land Area (in Hectares)	Land Under Miscellaneous Tree Crops etc. Area (in Hectares)	Culturable Waste Land Area (in Hectares)	Fallows Land other than Current Fallows Area (in Hectares)	Current Fallows Area (in Hectares)	Net Area Sown (in Hectares)	Total Unirrigated Land Area (in Hectares)	Area Irrigated by Source (in Hectares)	Canals Area (in Hectares)	Wells/Tube Wells Area (in Hectares)	Tanks/Lakes Area (in Hectares)	Waterfall Area (in Hectares)	Other Source (specify) Area (in Hectares)
3		Gautam Budha Nagar	Jew ar	73.88	605.02	118.69	0.33	99.7	88.79	381.64	212.18	9106.14	33	9073.14	1993.13	6442.62	1.53	5.09	630.77
Total				73.88	5132.55	118.69	60.28	353.76	1052.99	434.21	560.143	38778.425	33	38745.43	7268.98	27935.975	157.53	5.09	3377.9

3.10. Conclusion

The sand mining project in Palwal District is poised to drive economic growth by creating jobs and improving infrastructure. The detailed socioeconomic study underscores the project's potential to elevate the living standards of the local population. However, careful planning and sustainable practices are imperative to balance economic benefits with environmental protection. By addressing the gaps in basic amenities and leveraging the existing demographic and occupational structures, the project can achieve its goals while fostering socio-economic development in the region. 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**

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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. Mechanized mining involves loading / unloading and transportation of mineral. The excavated mineral 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 upliftment 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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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 2-12).

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 98.156 ha (245.39 acres), out of total lease area, 80.292 ha (200.73 acres) will be mined-out and remaining 10.9280 ha (27.32 acres) area will be restricted zone for mining. A suitable combination of trees (total 13,710) that can grow fast and have good leaf cover to contain dust pollution shall

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 10.9280 ha 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 analyse 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 mechanized 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 to 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 kutch road. Air quality modelling was done using line source model as published by USEPA "Workbook of Dispersion Modelling" by Turner, for transportation through roads and the empirical emission factor equations from USEPA. Emission factors to be used in Line source Dispersion

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

equation is adopted from formula as given below and block wise emission rate are given in as Table:

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

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

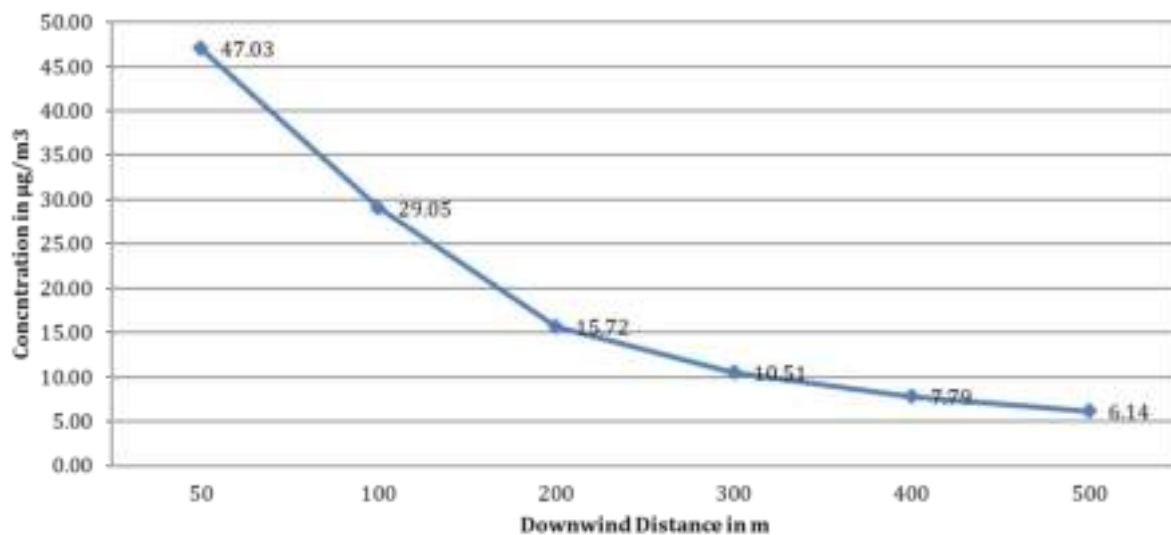
Thus, using equation (1):

Table 4-5: Emission Rate Estimation

Block Details	Emission Rate in kg/VKT	Emission Rate in g/sec/m
Chandhut (South) Block	0.77	0.0028

Concentration of the fugitive dust was calculated using the empirical equations for unpaved roads published by USEPA- AP42. For this, wind speed is assumed 1.3 m/s and height of source is 0 m. Modelling was done for an infinite line source assuming unpaved road. For conservative calculation wind was considered at a velocity of 2.8 m/s (baseline) perpendicular to the road. The results for 24 hourly concentration values are given in the below Figure 4.2 & 4.2.

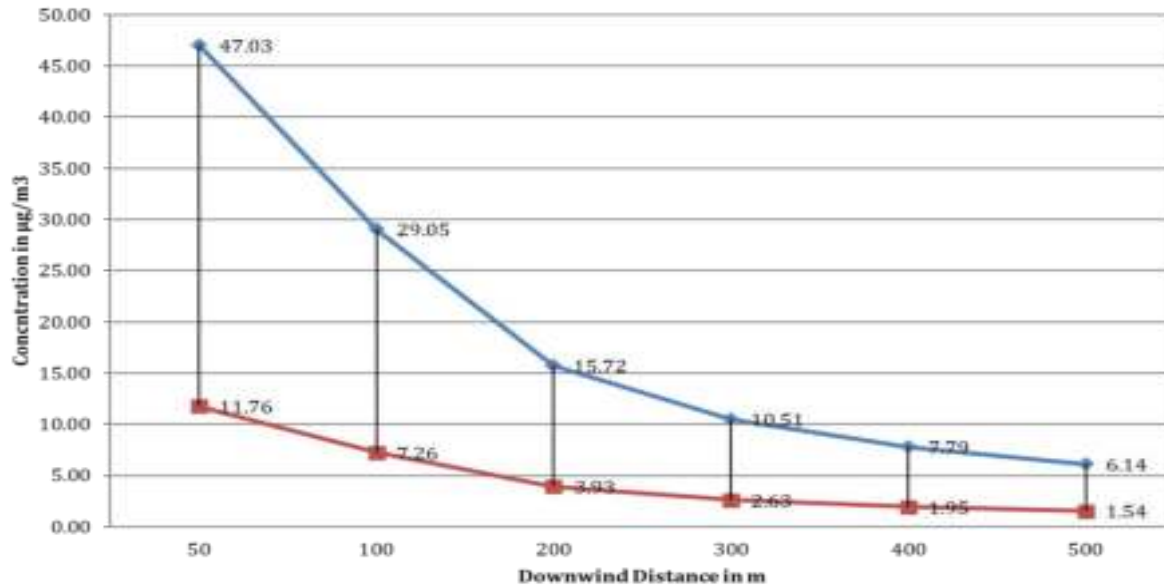
Figure 4.1: Concentration of Fugitive Dust v/s Distance (Uncontrolled)



DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 $\mu\text{g}/\text{m}^3$	50	47.03	11.76
	100	29.05	7.26
	200	15.72	3.93
	300	10.51	2.63
	400	7.79	1.95
	500	6.14	1.54

It is observed that the ground level concentration (GLC) decreases from 47.03 $\mu\text{g}/\text{m}^3$ at 50 m from the centre line of the road to 6.14 $\mu\text{g}/\text{m}^3$ at 500 m for proposed mining lease in un-controlled way and 11.76 at 500 m to 1.54 $\mu\text{g}/\text{m}^3$ at 50 m from the centre 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

- ✓ 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.

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. Modelling 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 only two mining blocks 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)	
			NO _x *	CO*
Chandhut (South) Unit	Truck	130	9.45	3.99

*- Emission Factor development for Indian Vehicles, ARAI Pune

4.5.3.4. Model Assumption

The emission load has been evaluated by Caline 4 for Vehicular Movement. The average meteorological data of pre-monsoon season (March to May 2024) 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	
	NO _x (µg/m ³)	CO (mg/m ³)
20	5.46	0.011
50	2.63	0.006
100	1.32	0.003
150	0.56	0.002
200	0.24	0.001

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. 1.54 (µg/m ³) will be add on to existing baseline conditions.	<ul style="list-style-type: none"> ❖ Only PUC Certified vehicles shall be deployed for the project. ❖ Regular maintenance check will be conducted for the vehicles. ❖ Traffic management plan will help in avoiding any traffic jams.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Attributes	Impact	Mitigation Measure
Animal	No Impact as it is part of riverbed.	❖ 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 mineral 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

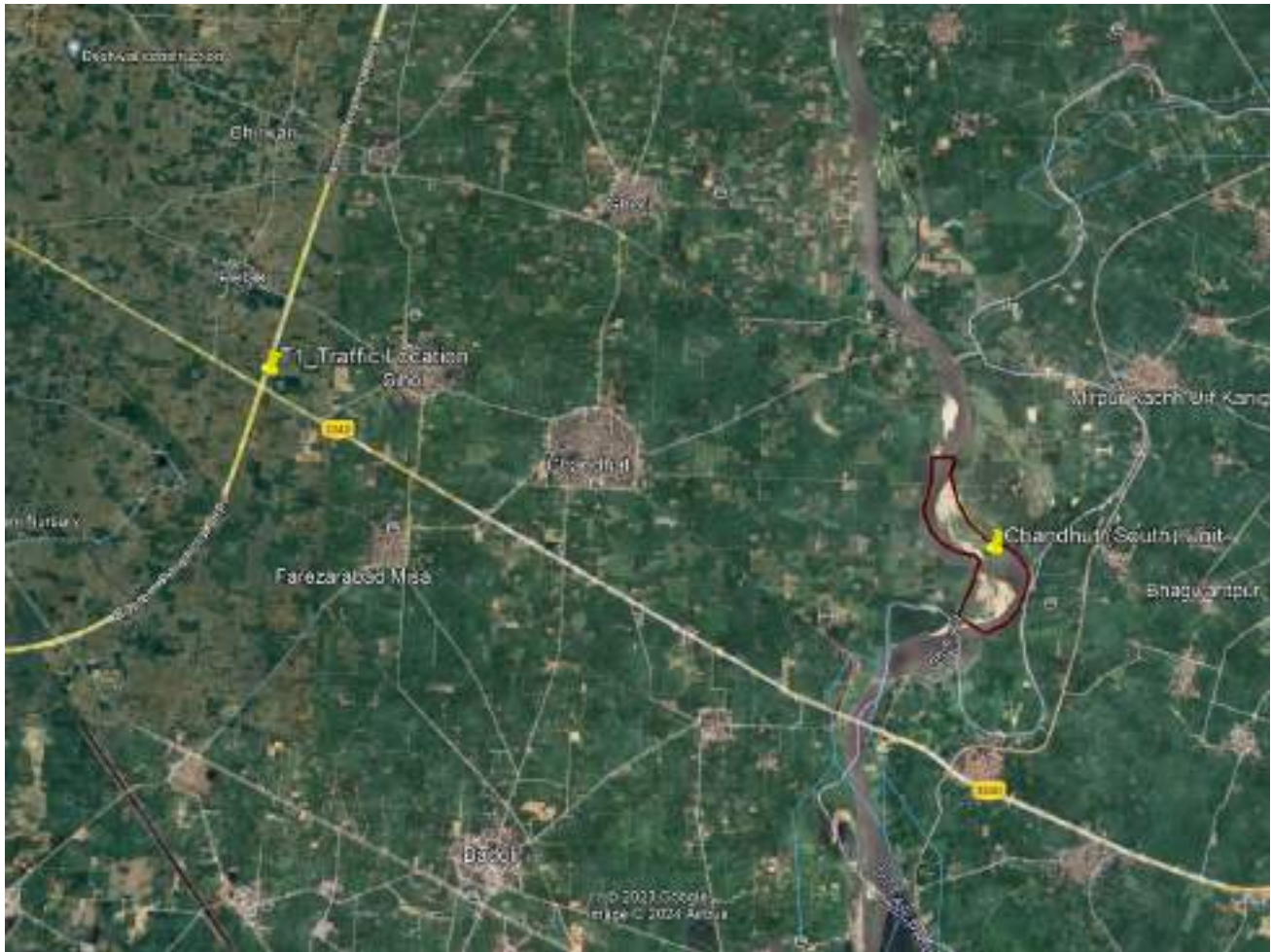
The extent of these impacts, at any given time, depends upon (i) the rate of vehicular emission within a given stretch of the road and (ii) the prevailing meteorological conditions. The impacts have strong temporal dependence as both factors vary with time. The temporal dependence would have diurnal,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

During proposed mining, there will be an increase in traffic flow as one location was identified for traffic survey location as one was in NH-334D which connect to Palwal crossing Eastern Peripheral Expressway. The traffic density in near to proposed site is minimal. Traffic survey location is marked in Figure 4.3.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhuti (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhuti South, Tehsil & District Palwal and State Haryana.

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 (Including traffic of Sultanpur Unit and Thantri Unit) 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	7.9	WNW	927	2781	336	336	135	135	437	219	163	245	49	221	3937

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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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
	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 free 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	219	135	336	2781	245	221	3937	15,000	0.26	B

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 zone of stable flow (LOS Category " B") 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 in PCU/day	V/C Ratio	LOS as per IRC
	T1	T1	T1
		15,000	
2024	3937	0.26	B
Addition due to project (130 dumpers/trucks)	1941		
2025	5878	0.39	B

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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Year	Traffic Volume in PCU/day	V/C Ratio	LOS as per IRC
	T1	T1	T1
2026	6289	0.42	C
2027	6729	0.45	C
2028	7200	0.48	C
2029	7704	0.51	C
2030	8243	0.55	C

Source- Field Survey conducted during monitoring season.

After commencement of the project, the projected traffic represents zone of stable flow (LOS Category "B") and represents a zone of stable flow conditions in 2025 also which is convenience at location. 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 13,710 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 stress level, hearing loss, sleep disturbance etc. due to prolonged exposure. Total 1941 PCU/ day will increase in the existing traffic due to this mining activity hence vehicle collision may occur unwanted sound and can also cause 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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Attributes	Impact	Mitigation Measure
	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.	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.
Crops	There is no major impact on plants and crops due to this operation.	It is proposed to plant 13,710 nos. of plants in plan period. The truck movement will be from suggested transportation route only. Regular Health check-up camps will be organized.

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 16.1 KLD for the mining operation, domestic use, and plantation purpose. 13.7 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 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	

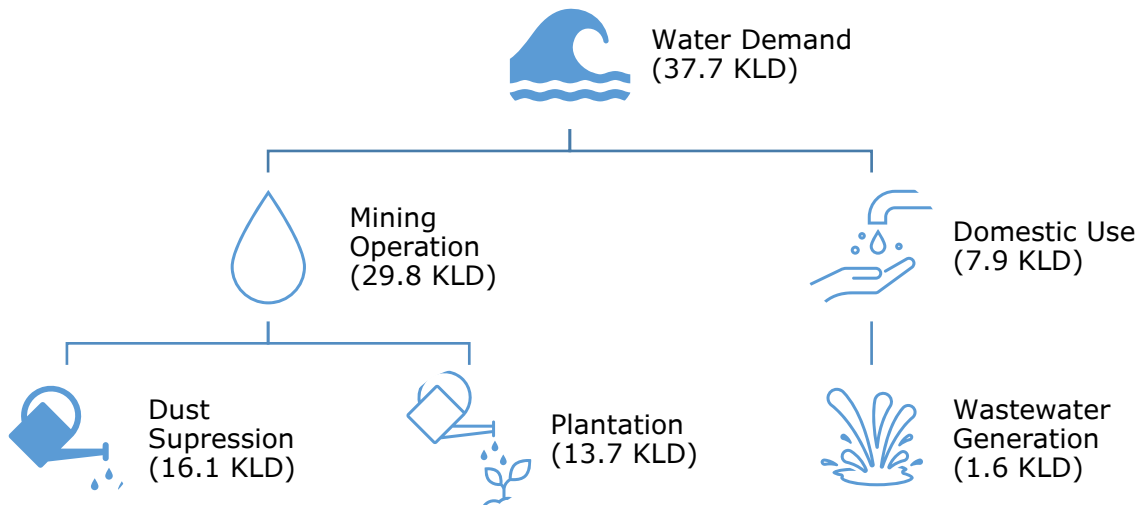
Table 4-17: Water Demand Estimation & Budget

Mitigation Measures	Break-up	Demand
Drinking & Domestic @45 lpcd/ worker	(175 workers x 45 lpcd = 7875 l/ day)	7.9 KLD
Plantation (Mine Lease 6,250 / Year & Haul Road 605)	(6,250 Trees x 2 l/ day + 605 Trees x 2 l/ day = 13,710 l/day)	13.7 KLD
Dust Suppression@0.5 L/Sq.m (Twice in a day)	Area for Dust Suppression = (1,815 m haul road + 1,400 m within the mine lease) x 5 m Width = 16,075 m ² x 0.5 l/sqm x 2 = 16,075 L/day	16.1 KLD
Total in KLD		37.7 KLD

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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 80.292 ha only out of 98.156 ha as 10.9280 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 1/3 rd 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Figure 4.5: Impact of Mining on Ground Water

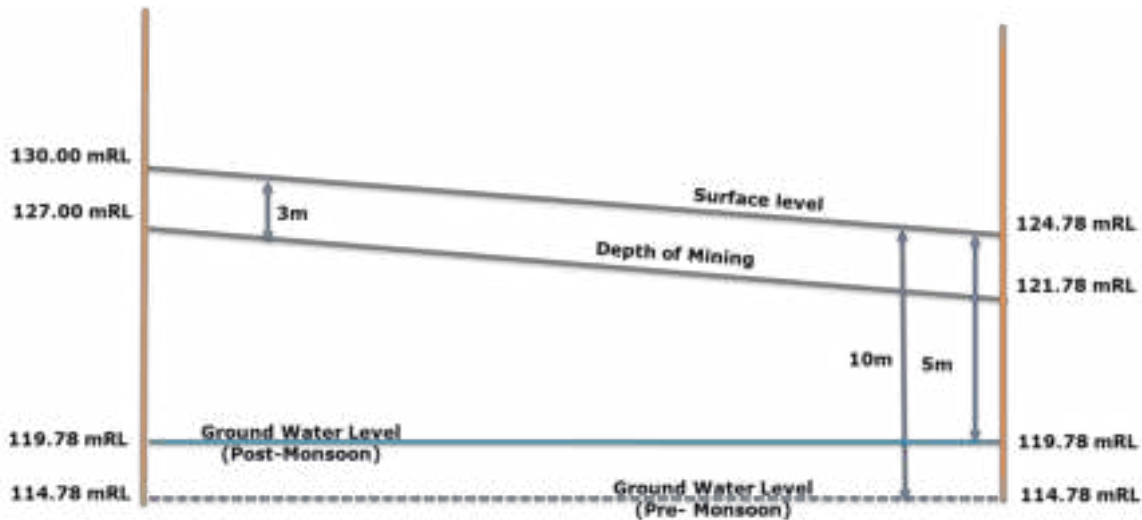


Table 4-19: Impact on Hydrology and Its Mitigation Measures

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.

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

Impact	Mitigation Measure
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.
Fugitive emission from vehicle movement will form a layer in leaves thus reducing the gaseous exchange process. This ultimately affects the growth of plants.	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 will be done to check the dust load and Air Pollution Tolerance Index (APTI).
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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Impact	Mitigation Measure
	in the dust prone area, village area and wildlife sensitive areas.
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.
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.
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.
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.
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 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 67 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 maximum $1.54 \mu\text{g}/\text{m}^3$ from 50m distance from approach road in controlled manner. So, there 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
Mining activity will be committed to generate direct employment by recruiting 145 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	37.7 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Impact	Mitigation Measure
	It is proposed to plant 13,710 nos. of local tree species for plan period 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 1/3 rd 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 plan period 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 42 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.
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.

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4.15. Mine Closure Plan

Detailed in **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)

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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: <ul style="list-style-type: none"> ✓ 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: <ul style="list-style-type: none"> ✓ 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 transport. So, the cost of transportation of for labour will be negligible.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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S. No.	Particular	Alternative Option 1	Alternative Option 2	Remarks
4	Material transportation	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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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
<ul style="list-style-type: none"> ✓ 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. 	<ul style="list-style-type: none"> ✓ 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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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

The environmental monitoring & management budget has been proposed approx. INR 18.50 lakh as capital amount with INR 5.80 Lakh recurring amount for proposal period. For details, refer to [section 10.10](#) of chapter 10 of EIA report.

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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 was 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.

“Public Consultation” refers to the process by which the concerns of local affected persons and others who have plausible stake in the environmental impacts of the project or activity are ascertained with a view to considering all the material concerns in the project or activity design as appropriate. Public consultation process comprises of two parts, viz Public Hearing and written response from stakeholders.

This is the draft EIA report which will be submitted to PCB for the public hearing, Minutes of Public Hearing will be incorporated in final EIA report.

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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

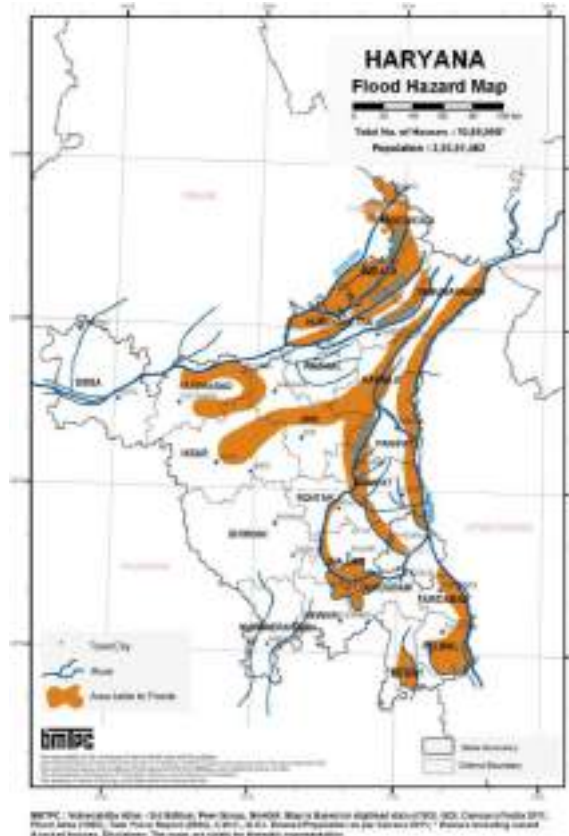
Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhuth (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhuth South, Tehsil & District Palwal and State Haryana.

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



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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

- 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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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°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)

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhuth (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhuth South, Tehsil & District Palwal and State Haryana.

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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

- 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. 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Table 7-3: Details of Prevent Occupational Hazard

Particulars	Control Measures
Heat & Light	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhuth (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhuth South, Tehsil & District Palwal and State Haryana.

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. The 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 analyse 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

- ✓ 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, Sonapat, 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 conducive. 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 13,710) 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 175 persons will get direct employment and 30 persons will get indirect employment form nearby villages. The workers will be mostly skilled.
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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Aspect	Project Benefits
	<ul style="list-style-type: none"> ✓ 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 has been addressed in section 10.8, 10.9 & 10.10 of chapter 10 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 175 direct and 30 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**

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 to 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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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

Particular	Description / Management
Noise Pollution and Control	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ A small amount of wastewater 1.6 KLD will be generated from domestic demand of water which will be stored in septic tanks within lease area.
4	Water Conservation	<ul style="list-style-type: none"> ✓ 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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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	6855	5484	-	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	6855	5484	1371		
III	-	-	1371		
IV	-	-	-		
V	-	-	-		
Total	13710	10968	2742		

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:

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Livelihood and Entrepreneurship: Helping rural communities in Chandhut South 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 aid 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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

The broad activities proposed under ESR initiative with occupational health & safety and year wise allocation of funds is shown in Table 10.7.

Table 10-7: Facilities & Budget under ESR Initiatives & OHS

S. No.	Description	Annual Budget
1	Health check-up camps	₹ 2,50,000
2	Insurance cover of workers	₹ 2,00,000
3	Assistance to local schools, scholarship to students at Govt. school in Chandhut South Village	₹ 2,50,000
4	Computer Lab for Govt. school in Chandhut South Village	₹ 1,00,000
5	Solar Street Lights on Panchayat & Govt. school in Chandhut South Village	₹ 50,000
6	Sanitations (Toilets) and drinking water facility of Govt. school Chandhut South Village	₹ 1,00,000
7	Vocational training to persons for income generation	₹ 75,000
8	Assistance to self-help groups	₹ 75,000
Total		₹ 11,00,000

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 98.156 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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

considered for calculation for financial assurance). Against this mined out area the total financial assurance (@15000/- per ha. Comes out to Rs 14,72,340 / which will be deposited in the form of Surety bond/ bank guarantee to the Director Mines & Geology Haryana. Total project cost is INR 17.0 crores and CA certificate is enclosed as **Annex 10.1**.

Table 10-8: 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	80.292	80.292	0.0	80.292
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	6.948	6.948	0.0	6.948
5.	Infrastructure (Workshop, Adm. Building & Road) in ancillary area only	-	0.60	0.60	0.00	0.60
6.	Safety zones	0.0	10.928	10.928	0.0	10.928
7.	Green belt	0.0	5.0*	5.00	4.00	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 reclaimed	98.156	0	0.0	0.0	0.0
Total		98.156	98.156	98.156	0.0	98.156

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	Recurring	Total
1	Pollution monitoring – Air, Water, Noise	₹ 0	₹ 60,000	₹ 3,00,000
2	Pollution Control – Water sprinkling	₹ 5,00,000	₹ 1,00,000	₹ 10,00,000
3	Wire fencing at plantation sites	₹ 1,50,000	₹ 50,000	₹ 4,00,000
4	Plantation including maintenance	₹ 6,00,000	₹ 1,50,000	₹ 13,50,000
5	Rainwater harvesting	₹ 3,00,000	₹ 20,000	₹ 4,00,000
6	Haul road and other roads repair and maintenance	₹ 3,00,000	₹ 50,000	₹ 5,50,000
7	Pre and post monsoon survey for sedimentation in the riverbed	₹ 0	₹ 1,50,000	₹ 7,50,000
Total		₹ 18,50,000	₹ 5,80,000	₹ 47,50,000

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.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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 13,710 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

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

11. Summary & Conclusion

11.1. General

This is the sand mine project on riverbed of Yamuna River. Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River with 43,35,000 MT/ year production over an area of 98.156 ha located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

- A Letter of Intent (LOI) has been issued by the Director Mines & geology Haryana vide letter No. DMG/HY/Chandhut (South) Unit/Palwal/2023/5727 dated 05.10.2023 for mining of Sand (Minor Mineral) in Chandhut (South) Unit, comprising Chandhut (South) village over an area of 98.156 ha (245.39 acres) in district Palwal, Haryana for a period of 10 years.
- 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 Memo No. MO/FBD/3589 dated 20.11.2023 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.
- The mining plan was submitted to department and mining plan was approved vide reference no. DMG/HY/MP/CHANDHUT SOUTH/PLWL/2024/2155 DATED 02.05.2024.
- Forest NOC has been issued by the Office of Divisional Forest Officer, Palwal Forest Division, Palwal vide reference no. 3693 dated 12.12.2023 which confirms project site is not part of any reserve forest or protected forest.
- The water requirement will be fulfilled by private water tankers. Electrical supply is available in all nearby villages. The permission will be taken from concerned department for the electricity use.

Table 11-1: Salient Features of Mine

S. No.	Parameters	Description
1.	Name of the project	Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) by M/s Apex Project Works.
2.	Nature & category of Mine	Non-Coal Mining Category 'B' of Activity 1(B)
3.	Project Proponent	M/s Apex Project Works
4.	Khasra No.	<p>For Mining</p> <p>77//, 14, 15 min, 16 min, 17, 24 min, 25 min, 107//, 4 min, 7 min, 14 min, 15 min, 16 min, 17, 24, 25 min, 115//, 1 min, 10 min, 11 min, 12 min, 19 min, 20, 21, 22 min, 116//, 3, 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 23, 24, 25, 146//, 3, 4, 5, 6, 7, 8, 9, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20 min, 21 min, 22, 23, 24, 25, 147//, 1, 2 min, 3 min, 8 min, 9, 10, 11, 12, 13 min, 17 min, 18, 19, 20, 21, 22, 23, 24 min 151//, 10 min, 11 min, 12 min, 13 min, 18 min, 19, 20, 21, 22, 23, 24 min 152//, 17, 18, 19, 20, 21 min, 22 min, 23, 24, 25</p>

PROPONENT: M/S APEX PROJECT WORKS, HARYANA 216

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 164

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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S. No.	Parameters	Description																																																									
		153// , 1 min, 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12 min, 13 min, 14, 15, 16, 17 min, 18 min, 24 min, 25 min, 182// , 2 min, 3 min, 4, 5, 6, 7, 8 min, 13 min, 14, 15, 16, 17, 18 min, 23 min, 24, 25, 183// , 1, 2, 3, 4 min, 5 min, 6 min, 7, 8, 9, 10, 11, 12, 13, 14, 15 min, 16 min, 17, 18, 19, 20, 21, 22, 23, 24, 25, 186// , 1, 2, 3, 4, 5 min, 6 min, 7, 8, 9, 10, 11, 12, 13, 14, 15 min, 16 min, 17, 18, 19, 20, 21, 22, 23, 24, 25 min, 187// , 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12 min, 13, 14, 15, 16, 17, 18, 19 min, 21 min, 22 min, 23, 24, 25, 215// , 16 min 216// , 1 min, 2, 3, 4, 5, 6, 7, 8, 9, 10 min, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 min, 22 min, 23, 24, 25, 217// , 1, 2, 3, 4, 5 min, 6 min, 7 min, 8, 9, 10, 11, 12, 13, 14 min, 17 min, 18, 19, 20, 21, 22, 23 min, 220// , 1, 2 min, 3 min, 9 min, 10 min, 221// , 3 min, 4 min, 5, 6 min. 293 min. For Ancillary area 105// 21, 22, 23, 24, 25 118// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15.																																																									
5.	Total Lease area	98.156 Ha (245.39 Acre) - Riverbed of Yamuna River																																																									
6.	Location of the project	Village- Chandhut South, Tehsil & District- Palwal, Haryana																																																									
7.	Toposheet No.	H43X8 - Project Site & G43F5, G43F9, H43X7, H43X8, H43X11 & H43X12 - Study Area.																																																									
8.	Maximum Production Capacity	43,35,000 Metric Tonne / Year																																																									
9.	Geological Mineral Reserve	49,25,880 Metric Tonne																																																									
10.	Blocked Mineral Reserve	5,90,112 Metric Tonne																																																									
11.	Mineable Reserve	43,35,768 Metric Tonne																																																									
12.	Geographical co-ordinates	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">Chandhut (South)</td> </tr> <tr> <td>A1</td> <td>28° 7' 22.4796"N</td> <td>77° 29' 23.399" E</td> </tr> <tr> <td>B1</td> <td>28°7' 15.652" N</td> <td>77°29' 21.692" E</td> </tr> <tr> <td>C1</td> <td>28°6' 51.324" N</td> <td>77°29' 38.139" E</td> </tr> <tr> <td>D1</td> <td>28°6' 49.868" N</td> <td>77°29' 45.677" E</td> </tr> <tr> <td>E1</td> <td>28°6' 46.099" N</td> <td>77°29' 50.988" E</td> </tr> <tr> <td>F1</td> <td>28°6' 39.589" N</td> <td>77°29' 55.700" E</td> </tr> <tr> <td>G1</td> <td>28°6' 33.250" N</td> <td>77°29' 54.415" E</td> </tr> <tr> <td>H1</td> <td>28°6' 25.798" N</td> <td>77°29' 51.588" E</td> </tr> <tr> <td>I1</td> <td>28°6' 19.887" N</td> <td>77°29' 46.534" E</td> </tr> <tr> <td>J1</td> <td>28°6' 15.97" N</td> <td>77°29' 36.67" E</td> </tr> <tr> <td>L1</td> <td>28°6' 22.16" N</td> <td>77°29' 24.65" E</td> </tr> <tr> <td>M1</td> <td>28°6' 31.708" N</td> <td>77°29' 29.316" E</td> </tr> <tr> <td>N1</td> <td>28°6' 43.035" N</td> <td>77°29' 33.998" E</td> </tr> <tr> <td>N2</td> <td>28°6' 45.131" N</td> <td>77°29' 32.411" E</td> </tr> <tr> <td>N3</td> <td>28°6' 46.154" N</td> <td>77°29' 24.476" E</td> </tr> <tr> <td>O1</td> <td>28°6' 48.827" N</td> <td>77°29' 18.139" E</td> </tr> <tr> <td>O2</td> <td>28°6' 52.236" N</td> <td>77°29' 14.026" E</td> </tr> </tbody> </table>	Point	Latitude	Longitude	Chandhut (South)			A1	28° 7' 22.4796"N	77° 29' 23.399" E	B1	28°7' 15.652" N	77°29' 21.692" E	C1	28°6' 51.324" N	77°29' 38.139" E	D1	28°6' 49.868" N	77°29' 45.677" E	E1	28°6' 46.099" N	77°29' 50.988" E	F1	28°6' 39.589" N	77°29' 55.700" E	G1	28°6' 33.250" N	77°29' 54.415" E	H1	28°6' 25.798" N	77°29' 51.588" E	I1	28°6' 19.887" N	77°29' 46.534" E	J1	28°6' 15.97" N	77°29' 36.67" E	L1	28°6' 22.16" N	77°29' 24.65" E	M1	28°6' 31.708" N	77°29' 29.316" E	N1	28°6' 43.035" N	77°29' 33.998" E	N2	28°6' 45.131" N	77°29' 32.411" E	N3	28°6' 46.154" N	77°29' 24.476" E	O1	28°6' 48.827" N	77°29' 18.139" E	O2	28°6' 52.236" N	77°29' 14.026" E
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PROPONENT: M/S APEX PROJECT WORKS, HARYANA 217

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PAGE 165

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Parameters	Description		
		P1	28°6' 55.886" N	77°29' 11.661" E
		P2	28°6' 59.260" N	77°29' 10.000" E
		Q1	28°7' 2.766" N	77°29' 9.457" E
		R1	28°7' 13.205" N	77°29' 12.799" E
		R2	28°7' 18.063" N	77°29' 12.912" E
		S1	28°7' 22.419" N	77°29' 12.698" E
13.	Topography of ML area	Highest elevation in riverbed at extreme north end is 127.25 mRL and bank top level is 130.0 mRL whereas the levels at the extreme south end in riverbed is 124.78 mRL and Riverbank top is 128.17 mRL. The Yamuna River flows from N to S direction in Chandhut revenue village.		
14.	Mining Method & Technology	Mining work will be carried out by mechanized 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. Adequate quantity of sand reserves is available for meeting consumer demand.		
15.	Ultimate depth of Mining	3 m from the riverbed of Yamuna River		
16.	Ground water level	05 - 10 m from the surface level		
17.	GWT intersection	Mining will be done only up to 3 m from surface. So, ground water table will not be intersected.		
18.	Working Days	268 Days		
19.	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.		
20.	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	16.10 KLD
		2	Greenbelt Development	13.70 KLD
		3	Domestic Requirement	7.90 KLD
		Total Says		37.70 KLD
				38.00 KLD
21.	Cost of project	The capital cost for the project will be Rs. 17 Crores including proposed lease area and machinery will be hired on contract bases.		

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 pre-monsoon season i.e., March to May 2024 to December 2023 in accordance with the guidelines for preparation of EIA studies.

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

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Table 11-2: Baseline Status

Parameters	Baseline Status
Ambient Air Quality	Particulate Matter: PM ₁₀ varying from 73 µg/m ³ to 89 µg/m ³ . PM _{2.5} was observed 25 µg/m ³ to 38 µg/m ³ . Gaseous Pollutants: SO ₂ was varying from 9.4 µg/m ³ to 14.9 µg/m ³ . NO _x was observed from 14.0 µg/m ³ to 19.3 µg/m ³ in study area. CO was observed from 1.01 mg/m ³ to 1.47 mg/m ³ in study area.
Noise Level	The Sound Pressure Level recorded during the daytime on all locations varies from 50.8 dB(A) to 51.8 dB(A) & in time it varies between 33.1 dB(A) to 36.4 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 (7.10 to 7.85), TDS (789 mg/l to 851 mg/l), alkalinity (219.5 mg/l to 274.3 mg/l), Total Hardness (287.5 mg/l to 309.6 mg/l), Calcium as Ca (61.9 mg/l to 74.8 mg/l), Magnesium as Mg (31.8 mg/l to 36.4 mg/l), Chloride (241.9 mg/l to 262.9 mg/l) & Sulphate (39.8 mg/l to 59.6 mg/l) parameters were analyzed.
Surface Water	The pH was between 7.36 to 8.14. The dissolved Oxygen of the sources was varying between 6.0 mg/l to 6.5 mg/l. BOD was observed 32.6 mg/l to 42.7 mg/l. Water was not usable due to bad quality.
Soil Quality	The soil was predominantly Loamy in the study area. The pH ranges 7.2 to 7.9. The conductivity was varying from 337 µmhos/cm to 416 µmhos/cm. Organic Carbon was varying from 0.59 % to 0.78 %. Nitrogen was varying from 134 kg/ha to 171 kg/ha. Phosphorous was varying from 12 kg/ha to 24 kg/ha. Potassium was varying from 128 kg/ha to 164 kg/ha. 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.
Meteorology	The maximum temperature recorded during the study period was 45.3°C in the month of May and the minimum temperature was 14.4°C in the month of March. The highest RH found in the study area was 79.7% in the month of April, while minimum monthly average RH found 45.5% in the month of March. The average wind speed recorded was 2.8 m/sec. Predominant wind direction during the study period was mainly South-West to North-East followed by North- East to South-West.

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 1,941 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 13,710 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.

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- ✓ There will be no impact on ground water table 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 1.6 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 42 Kg per day, which will have an adverse impact on human health. There will be 10 Nos. of garbage bins, 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.
- ✓ According to field survey, interviews of residents and authenticated checklist from forest department indicates the presence of 06 Schedule-I species in the buffer area of study area of proposed mine lease area. Hence, for the protection of these schedule-I species, a detailed conservation plan is proposed with futuristic approach. The species are Varanus benghalensis (Common Indian Monitor lizard), Naja naja (Indian Cobra), Ptyas mucosa (Rat Snake), Pavo cristatus (Indian Peafowl), Herpestes edwardsii (Common Mongoose) & Felis chaus (Jungle Cat), for the same conservation plan was prepared. Subsequently, a budget of Rs. 34 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.

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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 175 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.
- ✓ 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 18.50 Lakhs as a Capital Cost and INR 5.80 Lakhs per annum as a Recurring cost, respectively. Total budget of INR 47.50 Lakhs for environmental measurements has been ensured by the developer for plan period.

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 13,710 saplings and gap plantation considering 1000 / plant including maintenance

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CHAPTER – 12

DISCLOSURE OF THE

CONSULTANT

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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, analyse, 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

The following major services are being provided.

- | | |
|---|---|
| • 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 Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

an area of 98.156 ha located at Village Chandhut South, Tehsil & District Palwal and State Haryana by M/s Apex Project Works.

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

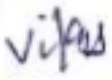

EIA Coordinator		Signature & Date
EIA Coordinator	Vikas Tripathi	 10.07.2024
Period of Involvement	March 2024 to till date	
Contact Information	9990156652 / 9819893405	

Table 12-2: List of Functional Experts

S. No.	Functional Areas	Name of Expert/s	Involvement (Period & Task**)	Signature & Date
1	AP	Vikas Tripathi	Involvement Period: (March to May 2024) <ul style="list-style-type: none"> ➤ 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	Involvement Period: (March to May 2024) <ul style="list-style-type: none"> ➤ 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	Involvement Period: (March to May 2024) <ul style="list-style-type: none"> ➤ Identification of nature of waste, categorization, and quantity of generated waste. ➤ Prediction of waste pollution and preparation of its management. 	
4	SE	Kripna Shukla	<ul style="list-style-type: none"> ➤ Collection of Secondary data (Census of India & District Handbook) 	




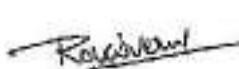
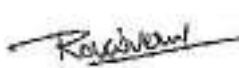
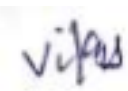
PROPOSER: M/S APEX PROJECT WORKS, HARYANA 225

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 172

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Functional Areas	Name of Expert/s	Involvement (Period & Task**)	Signature & Date
			<ul style="list-style-type: none"> ➤ 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 a need basis. ➤ 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	Involvement Period: (March to May 2024) <ul style="list-style-type: none"> ➤ 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	Involvement Period: (March to May 2024) <ul style="list-style-type: none"> ➤ 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	Involvement Period: (March to May 2024) <ul style="list-style-type: none"> ➤ 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	Involvement Period: (March to May 2024)	

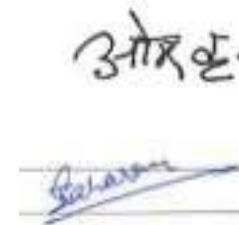
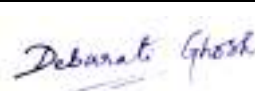

PROPOSER: M/S APEX PROJECT WORKS, HARYANA 226

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 173

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S. No.	Functional Areas	Name of Expert/s	Involvement (Period & Task**)	Signature & Date
			<ul style="list-style-type: none"> ➤ Collection of primary data ➤ Quantification of Air pollution sources (point and line sources) ➤ 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	Involvement Period: (March to May 2024) <ul style="list-style-type: none"> ➤ 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	Involvement Period: (March to May 2024) <ul style="list-style-type: none"> ➤ 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	Involvement Period: (March to May 2024) <ul style="list-style-type: none"> ➤ 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 	


PROPOSER: M/S APEX PROJECT WORKS, HARYANA 227

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 174

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Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Functional Areas	Name of Expert/s	Involvement (Period & Task**)	Signature & Date
			<ul style="list-style-type: none"> ➤ Delineating firefighting facilities and system ➤ Preparation of Occupational Health and Safety Management Plan with budgetary allocations. 	
12	SC	Shilpi Anand Ram Sushil Mishra*	Involvement Period: (March to May 2024) <ul style="list-style-type: none"> ➤ Collection of primary data ➤ Interpretation of existing quality of soil. ➤ Prediction of Impact and its management (if any). 	

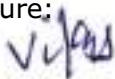
*Team member **

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 proposed Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha located at Village Chandhut South, Tehsil & District Palwal and State Haryana by M/s Apex Project Works.

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 Organization. **PARIVESH ENVIRONMENTAL ENGINEERING SERVICES, LUCKNOW**

NABET Certificate No.: **NABET/EIA/2124/IA 0092(Rev.01)**

Valid up to: **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 Apex Project works,
Through Sh. Upendra Kumar, Shop No. 1, Manjeet filling Station,
Near Yamuna Pul, Village Manglora, Distt. Karnal, 132001 Haryana

Memo No. DMG/HY/Chandhut (South) Sand Unit/Palwal/2023/5727
Dated Panchkula, the 5/10/2023

Subject: Acceptance of the highest bid in respect of the minor mineral Sand contract of "Chandhut (South) Unit" having tentative area of 245.39 Acre in the district Palwal, offered in e-auction held on 12.09.2023/issuance of Letter of Intent (LoI)- regarding.

You participated in the e-auction held on 12.09.2023 on the e-Auction web portal (<https://minesharyana.clauctions.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/2022/4433 dated 07.08.2023 in order to obtain mining contract of minor mineral sand mine of the district Palwal.

2. You offered the highest bid of Rs. 13,19,00,000/- (Rs. Thirteen Crores Nineteen Lakhs only) per annum against the Reserve Price of Rs. 13,14,00,000/- for obtaining the Mining Contract of Minor Mineral Mine namely 'Chandhut (South) Unit' for extraction of 'Sand' having total area of 245.39 Acre. 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. 13,19,00,000/- per annum offered by you in respect of 'Chandhut (South) 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 has accepted the aforementioned highest bid of Rs. 13,19,00,000/- 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 'Chandhut (South) Unit' subject to the following terms and conditions:

- 4.1 The period of the contract shall be 10 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. 21 (iv) 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. 21 (iii) 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. 21 (vi) 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. 13,19,00,000/- (Rs. Thirteen Crores Nineteen 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	13,19,00,000
2	Second Year	13,19,00,000
3	Third Year	13,19,00,000
4	Fourth Year	14,50,90,000
5	Fifth Year	14,50,90,000
6	Sixth Year	14,50,90,000
7	Seventh Year	15,95,99,000
8	Eighth Year	15,95,99,000
9	Ninth Year	15,95,99,000
10	Tenth Year	17,55,58,900

- 4.7 As per the terms and conditions of the grant, you are liable to deposit Rs. 3,29,75,000/- i.e. equal to 25% of the annual bid amount as "Security", out of which you have already deposited an amount of Rs. 1,31,90,000/- (Rs. One Crore Thirty One Lakhs Ninety 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. 1,97,85,000/- 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 Agreement. The documents in support of solvency of the surety shall be submitted duly evaluated as per current Collector Rates by the concerned Revenue Authority along with Non Encumbrance Certificate from the concerned Revenue Authority. In case, the surety offered by the For execution of 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.

Further, Surety will submit an affidavit to the effect that the property in question has not been offered as surety to the department of Mines and Geology, Haryana in some other case.

- 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 Lol/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 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.
- 4.14 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 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 Lol 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 License 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;

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 there under 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 Lol.


 Director
 Mines & Geology, Haryana

Speed/Registered Post

Endst. No. DMG/HY/Chandhut (South) Sand Unit/Palwal/2023/

Dated

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

1. Additional Chief 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.


 Director
 Mines & Geology, Haryana

Annexure A

Sr. No.	Name of Unit	Name of the Village	Details of Khaxra Numbers	Area in acre as per revenue record	Total Mineral Concession Area (in acre)	Period (in years)
1	Chandhat South	Chandhat South	<p>For Mining</p> <p>77// 14, 23 min, 10 min, 17, 28 min, 25 min, 107//, 4 min, 7 min, 19 min, 23 min, 10 min, 17, 24, 25 min, 115//, 1 min, 10 min, 11 min, 12 min, 19 min, 20, 21, 22 min, 116//, 3, 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 23, 24, 25, 106//, 3, 4, 5, 6, 7, 8, 9, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20 min, 21 min, 22, 23, 24, 25, 145//, 1, 2 min, 3 min, 8 min, 9, 10, 11, 12, 13 min, 17 min, 18, 19, 20, 21, 22, 23, 24 min, 155//, 10 min, 11 min, 12 min, 13 min, 18 min, 19, 20, 21, 22, 23, 24 min, 152//, 17, 18, 19, 20, 21 min, 22 min, 23, 24, 25, 153//, 1 min, 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12 min, 13 min, 14, 15, 16, 17 min, 18 min, 24 min, 25 min, 182//, 2 min, 3 min, 4, 5, 6, 7, 8 min, 13 min, 14, 15, 16, 17, 18 min, 23 min, 24, 25, 183//, 1, 2, 3, 4 min, 5 min, 6 min, 7, 8, 9, 10, 11, 12, 13, 14, 15 min, 16 min, 17, 18, 19, 20, 21, 22, 23, 24, 25, 186//, 1, 2, 3, 4, 5 min, 6 min, 7, 8, 9, 10, 11, 12, 13, 14, 15 min, 16 min, 17, 18, 19, 20, 21, 22, 23, 24, 25 min, 187//, 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12 min, 13, 14, 15, 16, 17, 18, 19 min, 21 min, 22 min, 23, 24, 25, 212//, 16 min, 210//, 1 min, 2, 3, 4, 5, 6, 7, 8, 9, 10 min, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 min, 22 min, 23, 24, 25, 217//, 1, 2, 3, 4, 5 min, 6 min, 7 min, 8, 9, 11, 12, 13, 14 min, 17 min, 18, 19, 20, 21, 22, 23 min, 220//, 1, 2 min, 3 min, 4 min, 10 min, 221//, 3 min, 4 min, 5, 6 min, 293 min.</p> <p>For Ancillary area</p> <p>105// 21, 22, 23, 24, 25 118// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15</p>	129.05	245.39	10
				17.34		

ANNEXURES – 1.2
CLUSTER NOC



Memo No. :- MO/FBD/ 3589

Dated :- 20/11/2023

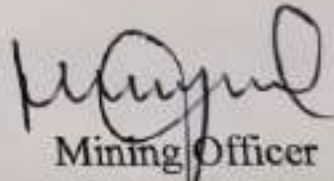
To

M/s Apex Project Works.
Shop No. 1, Manjeet Filling Station,
Near – Yamuna Pul, Vill- Manglora
Distt- Karnal-132201(HR)

Subject :- Status of other Mining Lease Situated within 500 m radius from our minor mineral Sand Project of “Chandhut (South) Unit” having area 245.39 Acre in the district Palwal awarded by Department of Mines and Geology Harynana vide Memo no. DMG/HY/Chandhut (South) Sand Uni/Palwal/2023/5727 dated 05.10.2023.

Kindly refer to your letter no. nil dated 30.10.2023 on the subject noted above.

In this regard, it is intimated that there is no operational mines/ contract within a radius of 500 meters of Chandhut (South). This is for your information and further necessary action.


Mining Officer
Deptt of Mines & Geology
Faridabad/Palwal

ANNEXURES – 1.3

APPROVED MINING

PLAN

From

The Director General,
Mines & Geology, Haryana,
DHL Square, Plot No.-9, Sector-22, Panchkula.

To

M/s Apex Project works through
Sh. Upender Kumar, Shop No. 1, Manjeet Filling Station,
Near Yamuna Pul, Village Manglora, District Karnal, 132001, Haryana.

Memo No. DMG/HY/MP/Chandhut South/PLWL/2024/ 9155
Dated Panchkula the 02-05-24

Subject:

Submission of draft Mining Plan & Progressive Mine Closure Plan for Sand Mine (Minor Minerals) of Chandhut Unit of Palwal District, Haryana comprising an area of 245.39 acres of M/s Apex Project Works, District Karnal.

Reference your letter dated 18.04.2024 on the above noted subject.

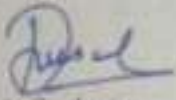
2. Vide letter under reference, the Mining Plan along with Progressive Mine Closure Plan in respect of an area of 245.39 acres of land in district Palwal was submitted for approval.

3. In exercise of the powers conferred by Rule 69 of the Haryana Minor Mineral Concession, Stocking, 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 Chandhut Sand Unit of Palwal District, of Minor Mineral over an area 245.39 acres of land situated in district Palwal. This approval is subject to the following conditions: -

- (i) That this Mining Plan along with 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.

- (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 five years 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; and
- (vi) That the Financial Assurance of Rs. 14,72,340/- (Rs. Fourteen Lac Seventy-Two Thousand Three Hundered Fourty 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.

Encl: Mining Plan & Progressive
Mine Closure Plan (2 copies)


State Geologist,
for Director General, Mines and Geology,
Haryana

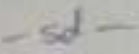
Registered Post

Endst. No. DMG/HY/MP/Chandhut South/PLWL/2024/

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, Ghaziahad for information and necessary action.

Encl: Mining Plan & Progressive
Mine Closure Plan


State Geologist,
for Director General, Mines and Geology,
Haryana.

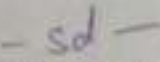
Registered Post

Endst. No. DMG/HY/MP/Chandhut South/PLWL/2024/

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, Palwal for information and necessary action.

Encl: Mining Plan & Progressive
Mine Closure Plan


State Geologist,
for Director General, Mines and Geology,
Haryana.

Endst. No. DMG/HY/MP/Chandhat South/PLWL/2024/

Dated:

A copy is forwarded to Sh. DC Yadav, HQP, House No. 282, Sector-11-D, Faridabad, Haryana, for information and necessary action.

Encl: Mining Plan & Progressive
Mine Closure Plan

- sd -

State Geologist,
for Director General, Mines and Geology,
Haryana.

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 CHANDHUT (SOUTH) UNIT



02-05-24

Total lease area=245.39 acres (98.156 hectares)

DISTRICT - PALWAL, STATE- HARYANA.

APPLICANT-

M/s Apex Project works, through Sh. Upender Kumar, Shop No.1, Manjeet Filling Station,
Near Yamuna Pul, Village Manglora, District Karnal,132001 (Haryana)

PREPARED BY

Dr. S.N.Sharma(BE- Mining, 1982) Qualified Person &

D.C.Yadav (M.Sc- Geology,1984) RQP/DMG/HRY/2018/03.

House No. 282, sector 11-D, Faridabad (Haryana)

**SUBMITTED TO- THE DIRECTOR GENERAL, MINES & GEOLOGY
HARYANA**

CONTENTS

S.NO	DESCRIPTION	PAGE NO
	Introduction	1-4
1.0	General	5
2.0	Location, Accessibility & Details of the Mining lease	6-10
3.0	Geology & Reserves	11-
	Details of existing mining pits	11
3.1	Physiographic, hydrology, Drainage and Climate	12
3.2	Geology of the Area	14
3.2.1	Regional Geology	14
3.2.2	Local Geology	15
3.2.3	Physical and Chemical Characteristics of Mineral	18
3.2.4	Origin and control of Mineralization	18
3.2.5	Grade and use of sand	24
3.2.7	Exploration	24
3.3	Reserves	25-29
4.0	Mining	30-
4.1	River Sand Mining and simultaneous reclamation	30
4.2	Mine Roads	30
4.3	Proposed Mining Method	32
5.0	Use of MINERAL	33
6.0	Details of Mining Machinery Deployed/ to be deployed	34



6.1	Details of Fuel consumption	34
7.0	Method of mining	35
7.1	Proposed year wise development for five years	35
7.2	Proposed rate of production when the mine is fully developed	36
7.3	Mineable reserves and anticipated life of the mine	36
7.4	Proposed method of mining	37-42
7.5	Conceptual Mining Plan	42
7.6	Blasting	43
7.7	Mine Drainage	43
7.8	Water Requirement	44
8.0	Stacking of Mineral Rejects & disposal during next 5 years	46
9.0	Details of Employment	47
10.0	Environment Management Plan	48-59
10.1	Measures taken/ to be taken for protection of Environment in and around mining areal	48
10.2	Measures taken/ to be taken for dumping overburden, stacking of top soil.	51
10.4	Measures taken/ to be taken for the control of water, noise and air pollution	51
10.4	Demographic details of the study area	54
10.5	Details of health checkups and insurance of all the employed person	55
10.6	Corporate Social Responsibility	56
10.7	Fund Provision for Environmental Management	59
	Fund Provision for E M P measures	59



	CHAPTER-11	60
	Progressive Mine Closure Plan	
1.0	Introduction	60
2	Mine description	64
2.1	General Geology and Local Geology	64
2.1.2	Local geology	64
2.2	Reserves	64
2.3	Mining Method	65
2.4	Mineral beneficiation	65
3.0	Review of implementation of mining plan including five years progressive closure plan up to the final closure plan	65
4.0	Closure plan	65
4.1	Mined out land	65
4.2	Water quality management	66
4.3	Air Quality Management:	67
4.4	Waste management	67
4.5	Top soil management	67
4.6	Tailing dam management	67
4.7	Infrastructure	67
4.8	Disposal of mining Machinery	67
4.9	Safety and security	68
4.10	Disaster management and risk assessment	68
4.11	Care and Maintenance during temporary discontinuance	69
5.0	Economic Repercussion of closure of mine and manpower retrenchment	70

6.0	Time scheduling for abandonment	70
7.0	Abandonment cost	71
8.0	Financial assurance	72
9.0	Certificates	73
10	Plan & section	Enclosed with report



List of annexure

Sr.no.	Description
1	Copy of Auction notice
2	A copy of LOI
3	Consent letter from applicant to prepare the mining plan
4	RQP Certificates
5	Replenishment report



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



INTRODUCTION

M/s Apex Project works, through Sh. Upender Kumar, Shop No.1, Manjeet Filling Station, Near Yamuna Pul, Village Manglora, District Karnal,132001 (Haryana) was the highest bidder (13.19 Crores) for the Sand quarries of Chandhut (South) Unit for which auction notice was issued on 07th August 2023 vide notice No. DMG/HY/Auction/Palwal/2022/4443 (Annexure – I) and auction held on 12-09-2023. A Letter of Intent (LOI) has been issued by the Director Mines & Geology Haryana vide letter no. DMG/HY/Chandhut (South) Unit/Palwal/2023/5727 dated 05-10-23 for Mining of Sand (Minor Mineral) in Chandhut (South) Unit , comprising Chandhut (South) village over an area of 245.39 acres in district Palwal, Haryana for a period of 10 years (Annexure – 2).

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 Rule 70 of 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 10 years and shall commence w.e.f. the date of grant of environmental clearance by competent authority and Consent to operate(CTO) 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;

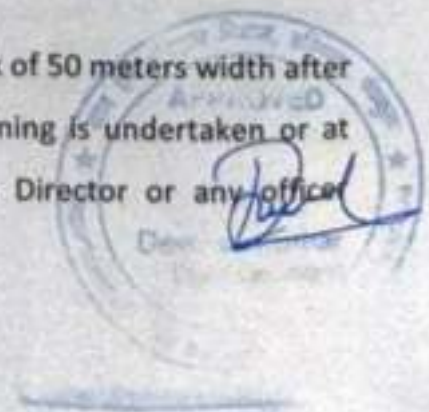


- The contractor shall also deposit/pay an additional amount equal to 7.5 % of the due contract money along with installments towards the 'Mines and Minerals Development, Restoration and Rehabilitation Fund';
- The contractor shall also deposit/pay an additional amount equal to 2.5% of the due contract money along with installments towards the 'District Mineral Fund'.
- The mining contractor shall get 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 Ministry of Environment, Forests and Climate Change, Government of India or as amended from time to time.
- The Mining contractor would also be liable to pay following to the land owners;
 - 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 three times of the average monthly production as per approved Mining Plan and/or quantity approved under Environment Clearance at any point of time.
- 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) 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 01st July to 15th September 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.
- 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) 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 there under shall prevail over all the terms and conditions.

CHAPTER-1

- **GENERAL:**

- a) **Name and address of the Lessee/applicant:**

M/s Apex Project works, through Sh. Upender Kumar, Shop No.1, Manjeet Filling Station, Near Yamuna Pul, Village Manglora, District Karnal,132001 (Haryana)

- **Status of the Applicant;-**The applicant is a Pvt. Ltd Co.
- **Phone No.:** +91-98128 44250
- **Fax No.-**Nil
- **Email-ID—**vipin.shrm001@gmail.com
- **The details of the leases already held by proponent-** This mine is the lone mine recently granted to M/s Apex Project works, through Sh. Upender Kumar, Shop No.1, Manjeet Filling Station, Near Yamuna Pul, Village Manglora, District Karnal,132001 (Haryana).There are no any other mines held by M/s Apex

Projects works anywhere in Haryana.,

Lease reference no. & date	Area	Postal address / Location	Type of Mineral	Workin g/non-workin	Status of approval of mining plan	Date of execution and date of expiry	Remarks
NA	NA	NA	NA	NA	NA	NA	NA

g) Name, Address and registration number of the RQP preparing the mining plan

The applicant has assigned the work of preparation of mining plan to D.C.Yadav Regd. No RQP/DMG/HRY/2018/03 & Dr. S.N.Sharma QP.(Consent letter enclosed as annexure -3 and copy of RQP certificates as annexure-4).

No. 282 Sector 11-D Faridabad (Haryana)

Mobile no. 9416214247; 09647848579

Email- dcyadav747@gmail.com

CHAPTER-2

Location, Accessibility &Details of the Mining lease

Lease area is shown on the Key Plan Plate – 2. It forms a part of G. T. Sheet No's 53 H/8,12 .The area is approachable from nearest town of Palwal, Faridabad, Hodal and Hassanpur. These are located about from 17 Kms east of Palwal City. All these quarries are connected by metalled road branching off from GT road NH-2 and road connecting Palwal Kithwari Hamidpur via Chandhut. River quarries as shown in the plate no, 2

State Headquarters: Chandigarh is about 340 km in the North of the lease area and National Capital Delhi is about 110 km from the north edge of the proposed area.

a) Details of the land covered in the 'Area' given in LOI dated 05-10-2023 (Annexure-2 and auction notice No.DMG/HY/Auction/Palwal/2022/4443 dated 07-



08-2023 (annexure-1)

Mining Lease of Sand (Minor Mineral) over an area of 98.156 ha is located in District Palwal namely Chandhut (South) Unit for extraction of the sand (river bed);

Name of block	Name of village	Area in Acres as per revenue record		Total Mineral concession Area	Details of Khasra Nos
		For Mining	For Ancillary Area		



Chandhu t (South)	Chandhu t	228.05	17.34	245.39	<p>For Mining</p> <p>77// 14, 15 min, 16 min, 17, 24 mir 25 min,</p> <p>107//, 4 min, 7 min, 14 min, 15 mir 16 min, 17, 24, 25 min,</p> <p>115//, 1 min, 10 min, 11 min, 12 mir 19 min, 20, 21, 22 min,</p> <p>116//, 3, 4, 5, 6, 7, 8, 13, 14, 15, 16 17, 18, 23, 24, 25, 146//, 3, 4, 5, 6, 7 8, 9, 11 min, 12, 13, 14, 15, 16, 17, 18 19, 20 min, 21 min, 22, 23, 24, 25,</p> <p>147//, 1, 2 min, 3 min, 8 min, 9, 10 11, 12, 13 min, 17 min, 18, 19, 20, 21 22, 23, 24 min</p> <p>151//, 10 min, 11 min, 12 min, 13 mir 18 min, 19, 20, 21, 22, 23, 24 min</p> <p>152//, 17, 18, 19, 20, 21 min, 22 mir 23, 24, 25</p> <p>153//, 1 min, 2 min, 3, 4, 5, 6, 7, 8, min, 12 min, 13 min, 14, 15, 16, 1 min, 18 min, 24 min, 25 min,</p> <p>182//, 2 min, 3 min, 4, 5, 6, 7, 8 mir 13 min, 14, 15, 16, 17, 18 min, 23 mir 24, 25,</p> <p>183//, 1, 2, 3, 4 min, 5 min, 6 min, 7 8, 9, 10, 11, 12, 13, 14, 15 min, 16 mir 17, 18, 19, 20, 21, 22, 23, 24, 25,</p> <p>186//, 1, 2, 3, 4, 5 min, 6 min, 7, 8, 9 10, 11, 12, 13, 14, 15 min, 16 min, 17 18, 19, 20, 21, 22, 23, 24, 25 min,</p> <p>187//, 2 min, 3, 4, 5, 6, 7, 8, 9 min, 1 min, 13, 14, 15, 16, 17, 18, 19 min, 2 min, 22 min, 23, 24, 25,</p> <p>215//, 16 min</p> <p>216//, 1 min, 2, 3, 4, 5, 6, 7, 8, 9, 1 min, 11 min, 12, 13, 14, 15, 16, 17, 18 19, 20, 21 min, 22 min, 23, 24, 25,</p> <p>217//, 1, 2, 3, 4, 5 min, 6 min, 7 mir 8, 9, 10, 11, 12, 13, 14 min, 17 min, 18 19, 20, 21, 22, 23 min,</p> <p>220//, 1, 2 min, 3 min, 9 min, 10 min, 221//, 3 min, 4 min, 5, 6 min.</p> <p>293 min.</p> <p>For Ancillary area</p> <p>105// 21, 22, 23, 24, 25 118// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 13, 14, 15</p>
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		228.05	17.34	245.39	
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GPS Coordinates of the proposed area are as under:

Block Name	Name of Village	Pillar	Latitude	Longitude
Chandhut (South)	Chandhut	A1	28° 7' 22.4796" N	77° 29' 23.3988" E
		B1	28° 7' 15.652" N	77° 29' 21.692" E
		C1	28° 6' 51.324" N	77° 29' 38.139" E
		D1	28° 6' 49.868" N	77° 29' 45.677" E
		E1	28° 6' 46.099" N	77° 29' 50.988" E
		F1	28° 6' 39.589" N	77° 29' 55.700" E
		G1	28° 6' 33.250" N	77° 29' 54.415" E
		H1	28° 6' 25.798" N	77° 29' 51.588" E
		I1	28° 6' 19.887" N	77° 29' 46.534" E
		J1	28° 6' 15.97" N	77° 29' 36.67" E
		L1	28° 6' 22.16" N	77° 29' 24.65" E
		M1	28° 6' 31.708" N	77° 29' 29.316" E
		N1	28° 6' 43.035" N	77° 29' 33.998" E
		N2	28° 6' 45.131" N	77° 29' 32.411" E
		N3	28° 6' 46.154" N	77° 29' 24.476" E
		O1	28° 6' 48.827" N	77° 29' 18.139" E
		O2	28° 6' 52.236" N	77° 29' 14.026" E
		P1	28° 6' 55.886" N	77° 29' 11.661" E
		P2	28° 6' 59.260" N	77° 29' 10.000" E
		Q1	28° 7' 2.766" N	77° 29' 9.457" E
		R1	28° 7' 13.205" N	77° 29' 12.799" E
		R2	28° 7' 18.063" N	77° 29' 12.912" E
		S1	28° 7' 22.419" N	77° 29' 12.698" 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)(Copy of LOI annexure-1)**

Based on the details in LOI dated 05-10-2023 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 Chandhut 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 1.80 kms

- d) **Key plan of the area**

Key plan: key plan on 1: 50,000 scales 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 (Plate no. 2)

- e) **Location map of the mining lease showing the details of the approach roads up to the mine**

Lease area is shown on the Key Plan Plate – 2. It forms a part of G. T. Sheet No's 53 H/8,12 .The area is approachable from nearest town of Palwal, Faridabad, Hodal and Hassanpur. These are located about from 17 Kms east of Palwal City. All these quarries are connected by metalled road branching off from GT road NH-2 and road connecting Palwal Kithwari Hamidpur via Chandhut. River quarries as shown in the plate no, 2

State Headquarters: Chandigarh is about 340 km in the North of the lease area and National Capital Delhi is about 110 km from the north edge of the proposed area.

- f) **Infrastructure facilities:**

10

261



Nearest railway station	Palwal , Railway station
Police station	Palwal
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,Balabgarh 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 1.80 km, working will be carried out in river bed. Sand Quarries in Yamuna has its outlet meeting the tar road on the nearby villages and from where the mineral will be 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.

CHAPTER-3
GEOLOGY & RESERVES

3.0 DETAILS OF EXISTING MINING PITS, THEIR DIMENSION AND LOCATIONS

Presently there is no pit available in the river bed. The monsoon waters/flooding in Yamuna River have peneplained the earlier worked river bed. Surface & geological plan & sections enclosed as Plate – 3.

Present Land use Pattern :- (in hectares)

S. No.	Particulars	Present land use in Acres
1.	Pit area	0.00
2.	Dump area	0.00
3.	Area for ancillary activities, office , rest shelter , mineral storage etc	17.34
4	Restricted area along lease boundry 7.5m= 8.96 acres), bedbar=2.21 acres, and ¼ restricted area of River banks=16.15 acres	27.32
5.	Plantation	0.00
6.	Area available for mining	200.73
Total		245.39

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 Mewat district, Eastern side by U.P. state and northern side by Faridabad district and falls in survey of India

topo sheets 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. CGWB has carried out groundwater exploration besides other hydro geological and geophysical studies in the district.

The river bed area is marked by North to South direction slope. Nearby area is almost flat topography of younger sedimentary formations, which are surrounded by fine-grained soil. Sand is transported and deposited in river bed during Monsoon. Sometimes floods cross 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/grid	River bank level (mRL)	River bed level (mRL)
N 1800- E1000	130.0	127.25
N1500 -E1000	129.80	126.74
N500- E1500	129.10	126.18
N300 E 1600	128.17	124.78

Highest elevation in river bed at extreme north end is 127.25 mRL and bank top level is 130.00 mRL where as the levels at the extreme south end in river bed is 124.78mRL and River bank top is 128.17 mRL

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 of 5.5 to 7.00m. The transmissivity 'T' value ranges between 55 to 200 m² / 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, semi arid 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° C (May & June)

Mean Minimum: 8° C (January)

Normal Rainy days : 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, 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, Sillimenite, Andalusite, phyllites, sandy phyllites.
Alwar series	Amphibole quartzite, marble, Amphibolites.
	Arkosic quartzites, quartzites & Interealated phyllite & schists. Magnetite & Hametite quartzites etc.
	Phyllite & schists.

• 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

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:

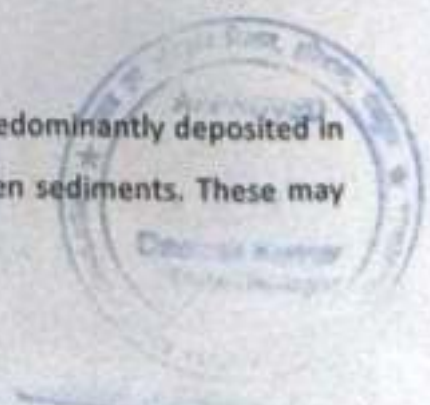
Soil/ alluvium: The finer sediments have been deposited in the flood plains of the River Yamuna.

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.



PHI - mm CONVERSION $\phi = \log_2 (d \text{ in mm})$ $1 \mu\text{m} = 0.001 \text{mm}$		Fractional mm and Decimal inches	SIZE TERMS (after Wentworth, 1922)	SIEVE SIZES		Intermediate diameters of natural grains equivalent to sieve size	Number of grains per mg		Settling Velocity (Quartz, 20°C)		
mm	ASTM No. (U.S. Standard)			Tyler Mesh No.	Quartz spheres		Natural sand	Spheres (Bibka, 1971) cm/sec	Crushed		
-8	256	10.1"	BOULDERS (7-80)								
-7	128	5.04"		COBBLES							
-6	64.0	2.52"	PEBBLES		2 1/2"	2"					
-5	53.9			very coarse	2.12"	2"					
-4	45.3			coarse	1 1/2"	1 1/2"					
-3	33.1	1.26"			1 1/4"	1.06"					
-2	32.0			medium	3/4"	.742"					
-1	26.9	0.63"			5/8"	.525"					
0	22.8			fine	7/16"	.371"					
1	17.0	0.32"			3/8"	3					
2	16.0			very fine	5/16"						
3	13.4	0.16"			4	4					
4	11.3		Granules	5	5						
5	9.52	0.08"		6	6						
6	8.00		SAND	7	7						
7	6.73			8	8						
8	5.66			10	10						
9	4.76			12	12						
10	4.00			14	14						
11	3.36			16	16						
12	2.83			18	18	1.2	.72	.4		10	
13	2.38			20	20	.86	2.0	1.5		7	
14	2.00			25	24	.59	5.6	4.5		6	
15	1.63			30	28	.42	15	13		4	
16	1.41		35	32	.30	43	35		3		
17	1.19		40	35	.215	120	91		2		
18	1.00		45	42	.155	350	240		1	1.0	
19	.840	1/2	50	48	.115	1000	580		0.5	0.5	
20	.707		60	60	.080	2900	1700		0.329		
21	.545		70	65					0.1		
22	.420	1/4	80	80					0.065		
23	.354		100	100					0.023		
24	.297		120	115					0.01		
25	.250	1/8	140	150					0.0057		
26	.210		170	170					0.0014		
27	.177		200	200					0.001		
28	.149		230	250					0.00036		
29	.125	1/16	270	270							
30	.105		325	325							
31	.088		SILT								
32	.074			coarse							
33	.062	1/32		medium							
34	.053			fine							
35	.044		very fine								
36	.037	1/64	CLAY								
37	.031			Clay/ill boundary for mineral analysis							
38	.02	1/128									
39	.016										
40	.01	1/256									
41	.008										
42	.006	1/512									
43	.004										
44	.003										
45	.002	1/1024									
46	.001										



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.

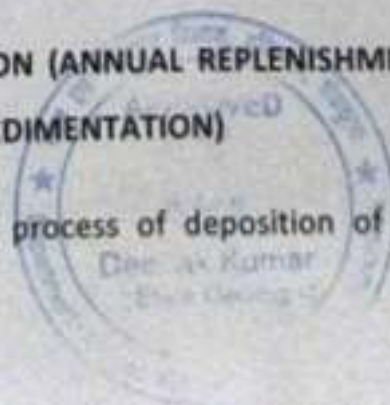
Sand Composition and Shape

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 sedimentology.

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

The factors which affect the "Computation of Sediment":

- Geomorphology & Drainage Pattern : The following geomorphic units play an important role :
 - Structural Plain
 - Structural Hill
 - Structural Ridge
 - Denudation Ridge & Valley
 - Plain & Plateau of Gangetic plain
 - Highly Dissected pediment
 - Un dissected pediment
- Distribution of Basin Area River wise (Area in Sq. Km or Sq. Miles)
- Drainage System/Pattern of the area (Drainage Density =Km/Sq. Km of Yamuna River)
- Rainfall & Climate : Year wise Rainfall data for previous 10 years of Yamuna Basin/River
- As per Dandy & Bolton study "Sediment Yield" can be related to
- Catchment Area and
- Mean Annual Run-off

Sand is an essential minor mineral used extensively across the country as a useful



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

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 Uttarkashi 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

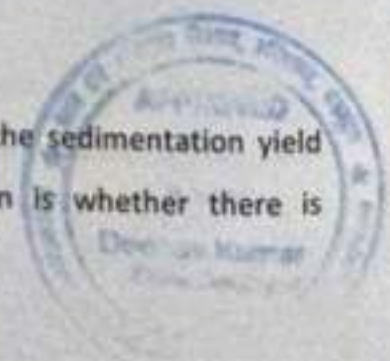
most extensive tributary of the Yamuna. Other tributaries in the area are the Rishi Ganga, Giri, Hanuman Ganga, Kunta & Bata, which sap the upper drainage basin of the huge Yamuna river. Subsequently, the river moves down the terrains of Doon basin at DakPathar close to Dehradun, in this place water 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

• HP	5799/2240 (1.6 %)
• UP & Uttrakhand	74208/142 (21.50 %)
• Rajasthan	102883/39739 (29.80%)
• Haryana	21265/8214(6.5%)
• Delhi	1485/574(0.4%)
• 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:

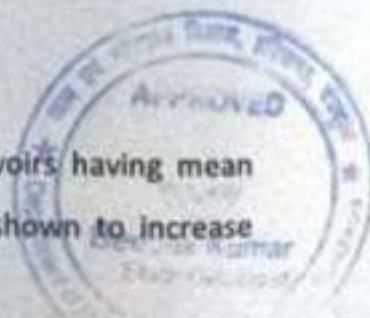
In which S = sediment yield in tons per square mile per year; SR = Reference sediment yield

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 Q_R = reference mean annual runoff $Q_R = 2$ 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, $Q_R = 2$ in., and $AR = 1$ mi², Eq. 15-12 reduces to the followings:

For $Q < 2$ in.: $S = 1280 Q^{0.46} (1.43 - 0.26 \log A)$

For $Q > 2$ in.: $S = 1965e^{-0.055Q} (1.43 - 0.26 \log A)$

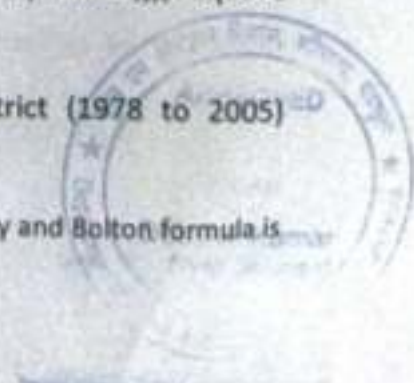
Equations 5-12 and 5-13 are based on average values of grouped data; therefore, they should be used with caution. In Certain cases, local factors such as soils, geology, topography, land use, and vegetation may have greater influence on sediment yield than either mean annual runoff or drainage area.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

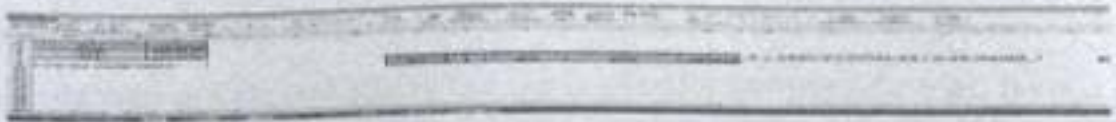
Calculation of Sediment Yield for Sand Mine of Chandhut (South) Block

Total Targeted Production is 43, 35,000 MT/year

- Drainage basin area of river Yamuna and its tributaries in Haryana : 8214 square miles
- Normal Annual Rainfall of Yamuna catchment area 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:





Dandy & Bolton 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 Much more than projected production of 45 Lakh Tones / Annum

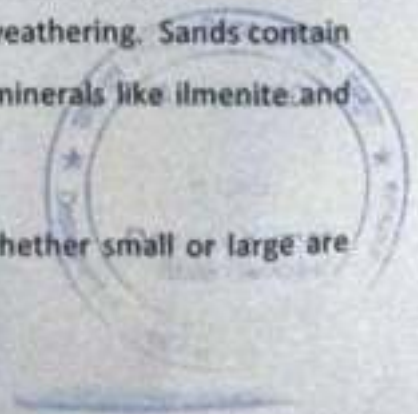
The equations express the general relationships between sediment yield runoff and drainage area. They may provide a quick rough approximation of mean sediment yields on a regional basis for preliminary watershed planning. Because Dandy & Bolton have derived the equation from average values computed sediment 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 from 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).

3.3 RESERVE

3.3.1 METHOD OF ESTIMATION OF RESERVE

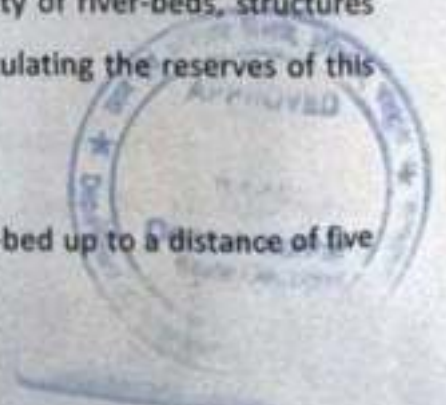
Volumetric method is adopted for calculating reserves of sand. Reserves are estimated on the basis of established width, thickness, and strike length based on influence of the mineralized formation in the river bed. Where good inferences are available only such area are considered for reserve estimation. 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

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



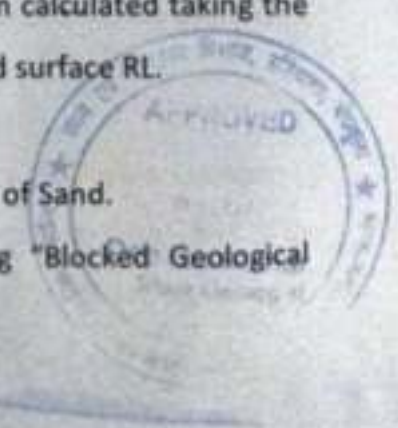
times of the span of a bridge on up-stream side and ten times the span of such bridge on down-stream side, subject to a minimum of 250 meters on the up-stream side and 500 meters on the down-stream side;

- (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.

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 river bed surface RL.

- 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.
- The bulk density of Sand is considered 1.80.
- Volumetric method is adopted for calculating reserves of Sand.
- 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”.

- 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”
- Replenishment report for the period Post-monsoon is enclosed as annexure-5

As this lease was auctioned during the rainy season and LOI was issued on 05-10-2023. Only partial report could be done. Therefore final replenishment report will be complete after next rainy season 2024 is over and only then final report will be submitted .

UNFC classification – Codes of UNFC are followed for reserve calculation

- 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.
- 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).
- Code (111): This code is provided for the economically mineable part of the measured mineral resources (proved category reserves).
- Code (121): This code is provided for the economically mineable part of the indicated mineral resources (probable category reserves).
- 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.
- 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

Reserves on account of river banks, lease boundary, railway line, highways, bridges, (where ever applicable) from total proved Geological Reserves”.

- 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”
- Replenishment report for the period Post-monsoon is enclosed as annexure-5

As this lease was auctioned during the rainy season and LOI was issued on 05-10-2023. Only partial report could be done. Therefore final replenishment report will be complete after next rainy season 2024 is over and only then final report will be submitted .

UNFC classification – Codes of UNFC are followed for reserve calculation

- 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.
- 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).
- Code (111): This code is provided for the economically mineable part of the measured mineral resources (proved category reserves).
- Code (121): This code is provided for the economically mineable part of the indicated mineral resources (probable category reserves).
- 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.
- 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.

- 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 and are 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
- Bulk density is based on the fact that the Regional Geology of the Sub-Himalyas comprising Subathu, Dhagsais, Kasaulis and Shiwaliks shows that the major mineral constituents in the catchment area of River Yamuna and its Tributaries are composed of clay, sand, silt, sandstone, shale, limestone, Marble, quartz, quartzite and ferruginous concretions etc. The bulk density of the constituent minerals is detailed as under.

Mineral	Bulk density(g/cm ³)
Clay	1.63 to 2.60
Silt	1.80 to 2.20
Sand	1.70 to 2.30
Sand stone	2.0 to 2.60
Shale	1.77 to 2.5
Limestone	1.93 to 2.90
Quartzite	2.70 to 2.80
Quartz	2.65
Marble	2.67 to 2.75

Sand is a mixture of above constituents mainly sand and silt. Therefore the average density of River Sediments namely river sand is considered as 1.80.

- 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



Total area in acres	Mining area in acres	Ancillary area in acres	Blocked area in acres including bed bar, 7.5m & ¼ of river banks	Geological Reserves MT	Blocked reserves MT	Mineable reserves MT	Targeted Production MT
245.39	228.05	17.34	27.32	49,25,880	5,90,112	43,35,768	43,35,000

• **PROVED RESERVES AS PER UNFC CODE (111)**

Total Geological reserves: 49, 25,880 MT

• **BLOCKED RESERVES AS PER UNFC CODE (211 & 222) =5,90,112 MT**

C) **MINEABLE RESERVES = (A-B) = 43, 35,768 MT**

D) **TARGETED PRODUCTION**

43, 35,000 MT per Year up to the lease period (or say 4.335 Million MT/year)

Note: Production from 2nd year onwards will depend on the quantity of mineral replenished. If the replenishment is more than the proposed production then production of 4.335 Million MT/year will be done. However, if the replenishment is less than the projected production then Production will be reduced proportionately based on the quantum of replenishment.

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.

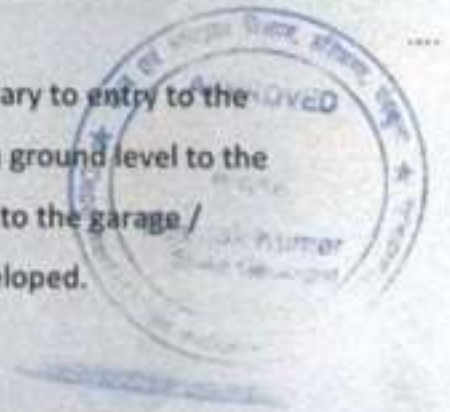


CHAPTER 4

MINING

DETAILS OF PRODUCTION & DISPATCHES OF FIVE YEARS: This is a new lease area allotted to the applicant. As it is a new mine. Area available for mining is 200.73 acres in district –Palwal. Total length of the area as per the description report stretches in the length of 1.80 km. Mining activity will be carried out in allocated areas only, enclosed as Annexure –I.

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

Semi-Mechanized mining with simultaneous reclamation yearly by rain fed waters and pollution free mining method shall be adopted. River sand used for construction industry is available in River Yamuna as well as 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, Sonapat, Faridabad and Palwal. The sand is a minor mineral and falls under the preview of the Mines and Geology Department, State of Haryana.

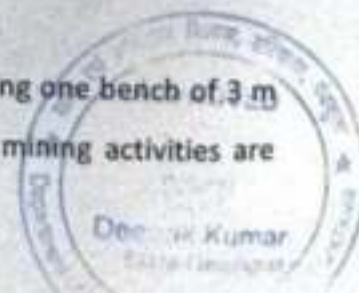
The sand mines of Chandhut (South) Unit District Palwal are approachable from Highway No.-2 and are about 15 -18 Kms on the East side from the highway. The village Chandhut and sand quarries are very well connected . The same will be used to take the mineral transported to various destinations. Katcha roads will be developed from Tar road to the mine site bypassing the villages.

4.2 Mine Roads

Both villages in the proposed lease area of Chandhut (South) Unit are connected by metal roads . The mine roads branching off the village roads, will be consolidated to prevent sinking of heavy truck wheels (IVA), the mine roads are proposed 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 suppressed by spraying roads with water at intervals of 3 hrs by using tractor/truck mounted water sprinklers. The water for this purpose will be obtained from tube wells located nearby/or permission will be taken to take/draw water from River Yamuna.

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 by 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) 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 10-05-2023.
- **No mining operation may be carried out from 01-07 to 15-09 every year (rainy season)**
 - Mining will be carried out about in about 268 days in a year.

Production Programme (Plate no.4)

Lease has been allotted for a period of 10 years only. Lease area consists of 245.39 acres in a total stretch of about 1.80 km. Out of this about 27.32 acres area is under restricted zone. About 200.73 acres 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 acres	Per production MT	day	Year wise production MT
					APPROVED

1	Chandhut (South) Unit)	200.73	16175	43,35,000
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Daily production proposed = 16175 tons

Production programme is 647 trips/ day @ 25 ton per trip

Working days have been taken as 268 days per annum.

Projected Production per Year = 268 x16175=43, 35,000 Tons

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

Year	Trips/ day	MMTPA
I	647	4.335
II	647	4.335
III	647	4.335
IV	647	4.335
V	647	4.335

CHAPTER-5

USE OF MINERAL

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



CHAPTER - 6

DETAILS OF MINING MACHINERY 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.
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35



1	Excavator cum loader	2.0 m ³	11
2	Tippers/ Trucks	25 tons	130
3	Water Tanker	10000 litres	2
4	Light vehicles	--	2

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 130 Dumper = $130 \times 100 = 13000$ Ltr	13000
2.	JCB	Diesel consumption 10ltr / hr working of 20 hrs diesel consumption = $11 \times 20 \times 10 = 2200$ ltr	2200
3.	Water Tankers	Diesel consumption 10 ltr/Hour $\times 10 \times 2 = 200$	200
4.	Light Vehicles	Diesel consumption 8 ltr/Hour $\times 10 \times 2 = 160$ ltr	160
		Total diesel requirements per day	15560

CHAPTER- 7

METHOD OF MINING

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 200.73 acres in district –Palwal. Total length of the area as per the description report stretches in the length of 1.80 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.

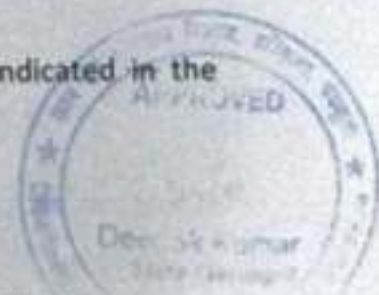
Bench will advance parallel to the banks of the river. Height of bench will be 3.0 m. Width of the bench will be around 20.0 m. Workings will be restricted within the lease area/ khasra as per the description report given by Mining Department. Mining activities will be carried out in a manner so that 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.

7.1 Proposed year wise development for five years

Sand lease has been granted for a period of 10 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 268 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	4.335	-
2	4.335	-
3	4.335	-
4	4.335	-
5	4.335	-

7.3 Mineable reserves and anticipated life of the mine

Lease will be granted for a period of 10 years only as per HMMCR, 2012. During rainy season there is replenishment of the mineral, which helps in sustaining the production.

Estimated Mineable reserves up to 3.0 m available are = 43,35,768 MT which are replenished every year during rains.

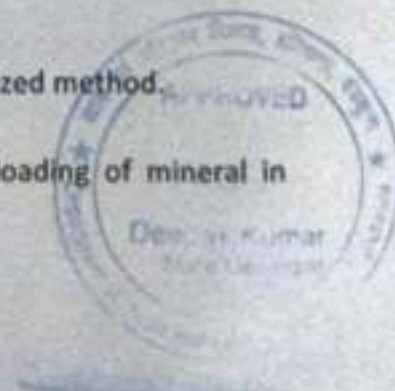
Proposed targeted Production= 43,35,000 MT/year

Anticipated production during lease period will be = 43.35 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 about 1.80 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. In 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: -

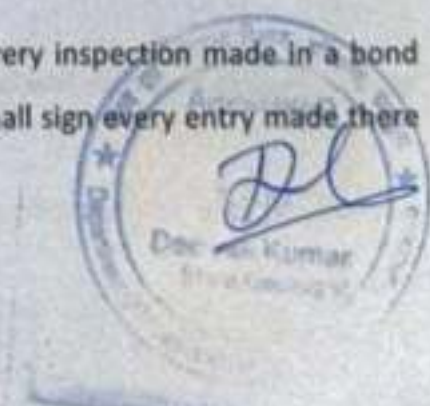
- Excavators will be provided with efficient warning devices, front & rear lights and efficient brakes.
- Excavator will be under the charge of a competent person authorized in writing by the manager designated as operator.
- No person other than the operator or his helper if any will ride on the excavator 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: -

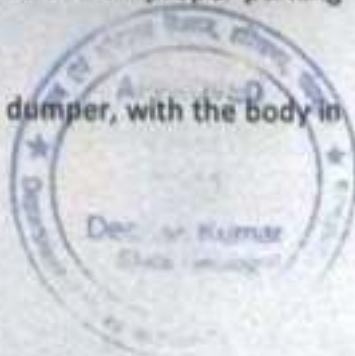
- At the commencement of every shift the operator will personally inspect and test the machine, paying special attention to the following details: -
 - The brakes and every warning device are in working order.
 - Lights are in working order.
 - The operator will neither take out the machine for work nor will he work the machine unless he is satisfied that it is mechanically shown and in efficient working order.
 - 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.



- The operator will keep the cab window clean so as to ensure clear vision at all times.
- The operator will not operate the machine when persons are in such proximity as to be endangered.
- Before leaving the machine, the operator will lower the bucket to the ground.
- 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.
- The operator will not allow any unauthorized person to ride on the machine.

Dumper: -

- Every dumper will be provided with efficient brakes.
- Efficient audible warning devices will be provided with the dumpers.
- The dumper, if required to work after daylight hours, efficient headlights and taillights will be used.
- Every dumper will be under the charge of a competent person, authorized in writing by the manager.
- No person, other than the driver or his helper, if any, will ride on a dumper.
- No person will be permitted to ride in the running board of a dumper.
- The loaded dumpers will not be reversed on gradients.
- Sufficient stop blocks will be provided at every tipping point and these will be used on every occasion when material is dumped.
- 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.
- When not in use, every dumper will be moved to and stood on proper parking places.
- 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.

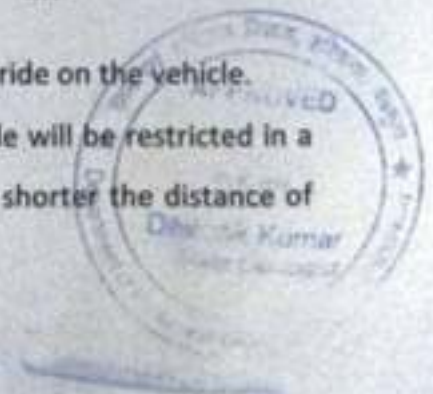
- The mechanical wised mechanism will not be depended upon to whole the body of a dumper in a rest position.
- No unauthorized person will be permitted to enter or remain in any turning points.
- While infiating tyres, suitable protective cages shall be used.
- Tyres will never be inflated by sitting either in the front or on the top of the same.
- 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.
- At least once in every two weeks the brakes of every dumper will be tested as below: -
 - 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.
 - 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.
 - 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 counter signed by the engineer and manager.
 - All vehicles shall be tested and examined once at least in every 6 months.
 - 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: -

- Tyre pressure, brakes, horn and the Lights are in working order.
- 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.
- 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.
- The driver will keep the cab window clean so to ensure clear vision at all times.
- Driver will ensure that the gear is in neutral position before stopping the engine. He will park the vehicle: -
 - In reverse gear, on level roads and down gradients.
 - In low gear, on up gradients.
- The driver will negotiate downhill gradients in low gear, so that minimum of braking is required.
- The driver will not drive too fast, avoid distractions and drive defensively.
- 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.
- The driver will not operate the dumper in reverse unless he has a clear view of the area behind the vehicle.
- The driver will see that : -
 - The vehicle is not overloaded.
 - The material is not loaded in a dumper so as to project horizontally beyond the sides of its body.
- The driver will not allow any unauthorized person to ride on the vehicle.
- 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.



- 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.

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.

- **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 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 river bed is varying from 2-3 m only.

- 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

- **Land use 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 (acres.)	At the end of 5 th year (acres.)
1.	Pit area	0.00	0.00
2.	Dump area	0.00	0.00
3.	Restricted area	27.32	27.32
4.	Mineral Storage and ancillary area, office etc	17.34	17.34
5.	Plantation (in safety zone and ancillary area)	0.00	5.00*
6.	Area for mining/Naturally reclaimed area	200.73	200.73
Total		245.39	245.39

*Plantation in 5.0 ha land will be done under social forestry on land to be taken from Gram Panchayat..

* 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 bed area is marked by North to South direction slope. Nearby area is almost flat topography of younger 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/grid	River bank level (mRL)	River bed level (mRL)
N 1800- E1000	130.0	127.25
N1500 -E1000	129.80	126.74
N500- E1500	129.10	126.18
N300 E 1600	128.17	124.78

Highest elevation in river bed at extreme north end is 127.25 mRL and bank top level is 130.00 mRL where as the levels at the extreme south end in river bed is 124.78mRL and River bank top is 128.17 mRL

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	Requirement in KLD	Source

1	Dust suppression	25.0	Tube wells
2	Drinking	4.0	Tube wells
3	Green belt	6.00	Tube wells
	Total	35.00	

CHAPTER 8.0



STACKING OF MINERAL REJECTS & DISPOSAL OF WASTE

As stated earlier no waste of any kind will be produced. No soil or any other waste will be generated during River bed Mining. Only Sand mineral is targeted for 16175 tons per day i.e. 4.335 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	4.335	-
2	4.335	-
3	4.335	-
4	4.335	-
5	4.335	-

Note: Production from 2nd year onwards will depend on the quantity of mineral replenished. If the replenishment is more than the proposed production then production of 4.335 Million MT/year will be done. However, if the replenishment is less than the projected production then Production will be reduced proportionately based on the quantum of replenishment.

CHAPTER 9.0



DETAILS OF EMPLOYMENT

In this project the semi mechanized mining is proposed for production of sand. The proposed organizational structure for the project is worked out in view of the type of mining system adopted and the need of effective environment Management Plan. The requirement of various technical and non-technical personnel is determined while adopting the following norms:-

Man power requirement and its distribution.

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

S. No.	Category	Numbers
1	Manager – 1 st Class	1
2	Assistant managers	2
3	Foreman/Mates	2
4	Supervisory staff	2
5	Skilled personnel	16
6	Semi-skilled personnel	140
7	Un-skilled personnel	12
Total		175

CHAPTER 10



ENVIRONMENT MANAGEMENT PLAN

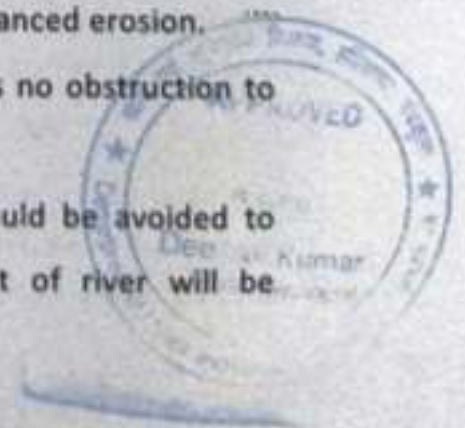
10.1 MEASURES TAKEN AND TO BE TAKEN FOR LAND RESTORATION, RECLAMATION AND PLANTATION IN/ OR NEARBY LEASE AREA

- 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:
 - Protection and restoration of ecological system
 - Prevent damages to the river regime
 - Protect riverine configuration such as bank erosion, change of water course gradient, flow regime etc.
 - 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

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 yearly.

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:-

- 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.

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.

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: Greenbelt Programme

Year	Saplings to be planted	Survival 80 %	Species	Place of Plantation
I	1000	800	Neem, Peepal, Mango, Shisham,	Along the roads, Along the river banks in schools and public building and other social forestry programme in consultation with gram Panchayat/Forest department..
II	1000	800	Sirish, Gulmohar and other local fruity plants	
III	1000	800		
IV	1000	800		

52

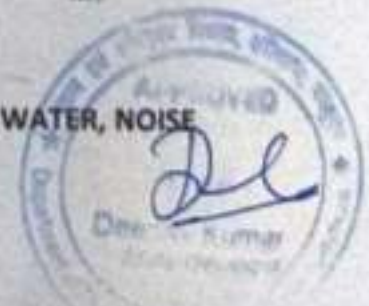
V	1000	800	
Total	5000	4000	

10.2 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.
- **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.

10.4 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:

- Plantation road side as it will prevent the spreading of dust.
- Water spraying will be done twice in a day over the haul road & roads leading to adjoining state roads.
- Dust respirators will be provided to the operators of the heavy earth moving machineries.
- Preventive maintenance shall be carried out of equipment.
- 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.
- 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
54			

			Industrial, Residential, Rural and Other Areas	Ecologically Sensitive Area (notified by central Government)
1.	2.	3.	4.	5.
1	Sulphur Dioxide (SO ₂), µg/m ³	Annual*	50	20
		24 hours**	80	80
2	Nitrogen Dioxide (NO _x), µg/m ³	Annual*	40	30
		24 hours**	80	80
3	Particulate Matter (Size less than 10 µm) or PM ₁₀ , µg/m ³	Annual*	60	60
		24 hours**	100	100
4	Particulate Matter (Size less than 2.5 µm) or PM _{2.5} , µg/m ³	Annual*	40	40
		24 hours**	60	60
5	Ozone (O ₃), µg/m ³	8 hours**	100	100
		1 hours**	180	180
6	Lead (Pb), µg/m ³	Annual*	0.50	0.50
		24 hours**	1.0	1.0
7	Carbon Monoxide (CO), mg/ m ³	8 hours**	02	02
		1 hours**	04	04
8	Ammonia (NH ₃), µg/m ³ -	Annual*	100	100
		24 hours**	400	400
9	Benzene (C ₆ H ₆), µg/m ³	Annual*	05	05
10	Benzo(O) Pyrene 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

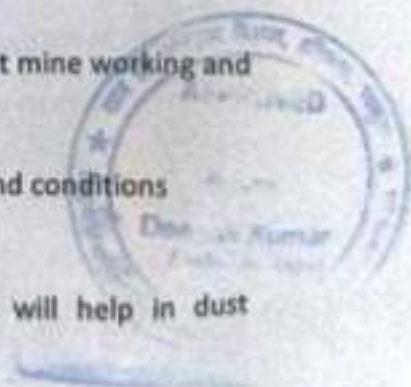
* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 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

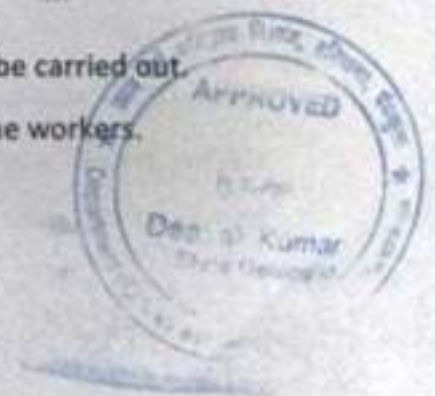
The source of NOx is due to vehicular emission. This can be controlled by proper maintenance and servicing of vehicles. Only P.U.C. certificated vehicles will be permitted

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.



• **DEMOGRAPHIC DETAILS OF THE STUDY AREA**

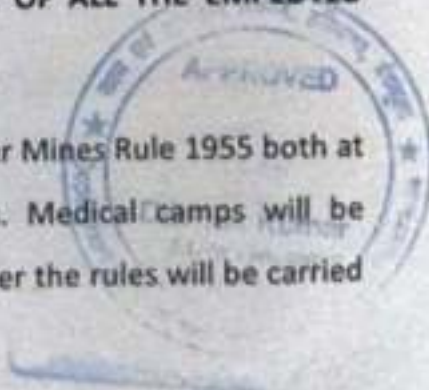
Total number of villages in which lease area falls is 1. Demographic details of the nearby villages are as follows. Main occupation is agriculture. The details are given below:-

Table: Demographic Details

Name	Households	Population	Males	Females
Thanthri	339	2190	1215	975
Rajapur Khadar	191	1246	666	580
Dostpur	30	273	152	119
Ghori	904	5977	3239	2738
Gurwari	92	628	334	294
Pahladpur	80	499	268	231
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

10.6 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.

10.7 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:

- 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 monetary assistance for adult education programme. Other activities proposed are:

- Targeted programmes for primary education for specially girl child
- Augmentation of infrastructure and equipments, furniture, blackboard, toilets etc inschools
- Scholarships to meritorious students
- Adult education & awareness about saving & investment plans.
- Partnerships in state sponsored education programmes
- School wall boundary maintenance
- Existing govt. school strengthening by boundary wall construction, construction of toilets, roof repair, drinking water taps, etc.
- Monetary contribution for expansion of govt. school from 6th to 12th class (construction of classrooms, field, toilets, taps etc.)

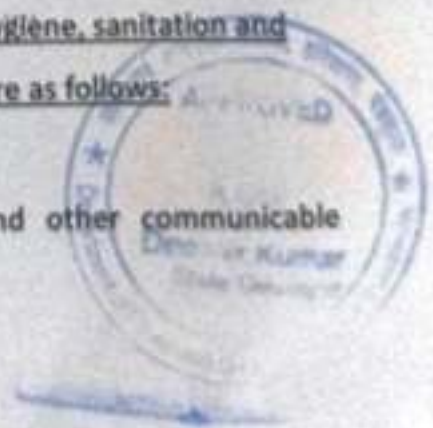
Capacity building activities such as following will be undertaken:

- Scholarship for ITI training outside for 20 persons
- Sponsorship of land losers / wards for full term courses
- Short term courses for skill up gradation
- Vocational training (dairy, poultry, bee keeping, sericulture)
- Specific Programmes for Ladies (stitching, embroidery, tailoring etc)

(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:

- Mobile Clinic with testing and diagnostic facilities
- Health Camps for Family Planning, HIV/AIDS and other communicable diseases.



- Addressing local health related issues through audio visuals and group meetings
 - Subsidized treatment in hospital with which tie-up will be there
 - Specific Programmes for hygiene and sanitation
 - Helping aids to each category of physically challenged as per requirement
 - Eye camps to address the issue of cataracts specially
- **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	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1	Health check up camps	2.50	2.50	2.50	2.50	2.50
2	Insurance cover of workers	5.0	5.00	5.00	5.0	5.00
3	Assistance to local schools, scholarship to students	5.0	5.0	5.0	5.0	5.0
4	Sanitations and drinking water facilities	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 ...	2.00	2.00	2.00	2.00	2.00
Total		17.00	17.00	17.00	17.00	17.00

10.8 Fund Provision for Environmental Management

It is proposed to create an Environment Management Fund. The contractor shall

deposit/pay an amount equal to 7.5 % of the due contract money along with installments towards the 'Mines and Minerals Development, Restoration and Rehabilitation fund & 2.5% of the due contract money along with the monthly installments towards the " District Mineral Fund".

- **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	1.50
4	Plantation including maintenance	1.50
5	Rainwater harvesting	3.0
6	Haul road and other roads repair and maintenance	3.0
7	Pre-monsoon and post monsoon survey for sedimentation in the river bed	3.0
	Total	20.00

CHAPTER 11



PROGRESSIVE MINE CLOSURE PLAN

1.0 Introduction

Name & address of the lessee

M/s Apex Project works, through h. Upender Kumar, Shop No.1, Manjeet Filling Station, Near Yamuna Pul, Village Manglora, District Karnal,132001 (Haryana)

(B) LOCATION OF THE LEASE AREA

Block Name	Name of Village	Pillar	Latitude	Longitude
Chandhut (South)	Chandhut	A1	28° 7' 22.4796" N	77° 29' 23.3988" E
		B1	28° 7' 15.652" N	77° 29' 21.692" E
		C1	28° 6' 51.324" N	77° 29' 38.139" E
		D1	28° 6' 49.868" N	77° 29' 45.677" E
		E1	28° 6' 46.099" N	77° 29' 50.988" E
		F1	28° 6' 39.589" N	77° 29' 55.700" E
		G1	28° 6' 33.250" N	77° 29' 54.415" E
		H1	28° 6' 25.798" N	77° 29' 51.588" E
		I1	28° 6' 19.887" N	77° 29' 46.534" E
		J1	28° 6' 15.97" N	77° 29' 36.67" E
		L1	28° 6' 22.16" N	77° 29' 24.65" E
		M1	28° 6' 31.708" N	77° 29' 29.316" E
		N1	28° 6' 43.035" N	77° 29' 33.998" E
		N2	28° 6' 45.131" N	77° 29' 32.411" E
		N3	28° 6' 46.154" N	77° 29' 24.476" E
		O1	28° 6' 48.827" N	77° 29' 18.139" E
		O2	28° 6' 52.236" N	77° 29' 14.026" E
		P1	28° 6' 55.886" N	77° 29' 11.661" E
		P2	28° 6' 59.260" N	77° 29' 10.000" E
Q1	28° 7' 2.766" N	77° 29' 9.457" E		
R1	28° 7' 13.205" N	77° 29' 12.799" E		
R2	28° 7' 18.063" N	77° 29' 12.912" E		
S1	28° 7' 22.419" N	77° 29' 12.698" E		

(C) EXTENT OF THE LEASE AREA

245.39 acres as explained at 2.0 in the main mining plan

(D) PRESENT LAND USE PATTERN

Details are given below:

S. No.	Particulars	Present land use in Acres
1.	Pit area	0.00
2.	Dump area	0.00
3.	Area for ancillary activities, office , rest shelter ,mineral storage etc	17.34
4	Restricted area along lease boundry 7.5m= 8.96acres), bedbar=2.21 acres, and ¼ restricted area of River banks=16.15 acres	27.32
5.	Plantation	0.00
6.	Area available for mining	200.73
Total		245.39

(E) METHOD OF MINING:

Lease area allotted for mining is 245.39 acres out of which 200.3 acres is free for mining. Total length of the proposed lease area as per the description report stretches in the length of 1.80 km. Mining activity will be carried out in allocated areas only,

Total production envisaged is 16175 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 98.156 ha 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.

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

& S.N.Sharma Qualified Person (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

2.2 Reserves-

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

Total area in acres	Mining area in acres	Ancillary area in acres	Blocked area in acres including bed bar,7.5m & ¼ of river banks	Geological Reserves MT	Blocked reserves MT	Mineable reserves MT	Targetted Production MT
245.39	200.73	17.34	27.32	49,25,880	5,90,112	43,35,768	43,35,000

- **PROVED RESERVES AS PER UNFC CODE (111)**

Total Geological reserves: 49,25,880 MT

- **BLOCKED RESERVES AS PER UNFC CODE (211 & 222) =5,90,112 MT**

C) **MINEABLE RESERVES = (A-B) = 43,35,768 MT**

D) **TARGETED PRODUCTION**

43,35,000 MT per Year up to the lease period (or say 4.335 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.

- **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 up to 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 80.292 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 (acres.)	Land use at the end of 5 years (acres.)
1.	Pit area	0.00	0.00
2.	Dump area	0.00	0.00

3.	Area for ancillary activities, office , rest shelter ,mineral storage etc	17.34	17.34
4	Restricted area along lease boundry 7.5m= 8.96 acres), bed bar=2.21 acres, and % restricted area of River banks=16.15 acres	27.32	27.32
5.	Plantation	0.00	5.0*
6.	Area available for mining	200.73	200.73
Total		245.39	245.39

Plantation will be done on the land available in gram Panchayat/schools or as advised by forest department.

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 10 -15 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 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.

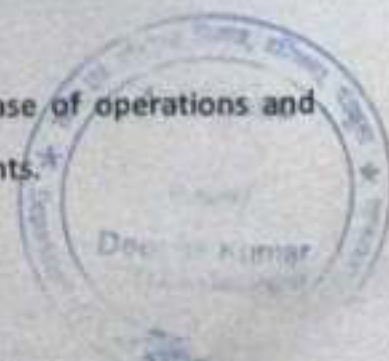
4.8 Disposal of mining machinery:

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.

- Safety measures will be implemented as per Mine Act 1952, MMR 1961, Mines Rules 1955.
- 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.
- Excavation will be not more than 3 m depth.
- Width of bench will be kept around 20.0 m for ease of operations and provide sufficient room for the movement of equipments.



- Protective equipment like dust masks, ear plugs/ muffs and other equipments shall be provided for use by the work persons.
- Notices giving warning to prevent inadvertent entry of persons shall be displayed at all conspicuous places and in particular near mine entries.
- Danger signs shall be displayed near the excavations.
- Security guards will be posted.
- 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 10 years only. As per the production programme envisaged, at the end of lease period, still sufficient mineral 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	5.00
Plantation cost	10000 0	10000 0	10000 0	100000	10000 0	including maintenance	

Wire fencing (meter)	500	500	500	-	-	@ of 200Rs per meter	3.00
Total							8.00

8.0 FINANCIAL ASSURANCE

Total 98.156 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 (acres.)	Land use at the end of 5 years (acres.)
1.	Pit area	0.00	0.00
2.	Dump area	0.00	0.00
3.	Area for ancillary activities, office , rest shelter ,mineral storage etc	17.34	17.34
4	Restricted area along lease boundry 7.5m= 8.96 acres, bedbar=2.21 acres, and ¼ restricted area of River banks=16.15 acres	27.32	27.32
5.	Plantation	0.00	5.00*
6.	Area available for mining	200.73	200.73
Total		245.39	245.39

Plantation will be done on the land provided by village panchayat/forest department.

Calculation for Financial Assurance

5. 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	80.292	80.292	0.0	80.292
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	6.948	6.948	0.0	6.948
5.	Infrastructure (Workshop, Adm. Building & Road) in ancillary area only	-	0.60	0.60	0.00	0.60
6.	Safety zones	0.0	10.928	10.928	0.0	10.928
7.	Green belt	0.0	5.0*	5.00	4.00	0.0
8.	Tailing pond	0.0	0.0	0.0	0.0	0.0
9.	Effluent treatment plant	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 specify reclaimed	to 98.156	0	0.0	0.0	0.0*

Total	98.156	98.156	98.156	0.0	98.156
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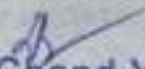
Total 98.156 ha area will be put in use. Against this area the total financial assurance (@15000/- per ha. Comes out to Rs 14,72,340 / which will be deposited in the form of Surety bond/ bank guarantee to the Director Mines & Geology Haryana.

9.0 CERTIFICATE

It is enclosed with the report.

10.0 PLAN AND SECTION

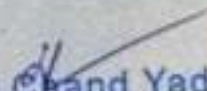
Plan and section are prepared and enclosed with the mining plan.


Duli Chand Yadav
DMG/HRY/RQP/2018/03



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 & Progressive Mine Closure Plan of SAND (Minor Mineral) over an area of 245.39 acres (98.156 hectares) of M/s Apex Project works, through h. Upender Kumar, Shop No.1, Manjeet Filling Station, Near Yamuna Pul, Village Manglora, District Karnal,132001 (Haryana) of Chandhut (South) Unit falling under Survey of India toposheet No . 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


 Duli Chand Yadav
 D.C.Yadav
 DMG/HRY/RQP/2018/03

RQP/DMG/HRY/2018/03.





[Signature]

Department of Mines and Geology
Government of Haryana
e-Auction Notice

Date 7th August, 2023

No. DMG/HY/Auction/Palwal/2022/4443

It is hereby notified for the information of the General Public that for grant of mining contracts / mineral rights, for excavation of minor mineral namely "Sand" from the minor mineral mines of the district Palwal, the e-Auction process (Registration/ User ID) and submission of bidding will be as per schedule given below:

Sr. No	Titles	From	To
1	Registration and Creation of user ID and uploading of documents	09/08/2023 10:00 AM	07/09/2023 Upto 05:00PM
2	Deposition of EMD	09/08/2023 10:00 AM	07/09/2023 Upto 05:00PM
3	E-service fee	09/08/2023	07/09/2023 Upto 05:00PM
4	Bidding	11/09/2023 10:00 AM	Till the conclusion of Auction

Note: The Online Training Videos for prospective bidders shall be available on e-Auction portal.

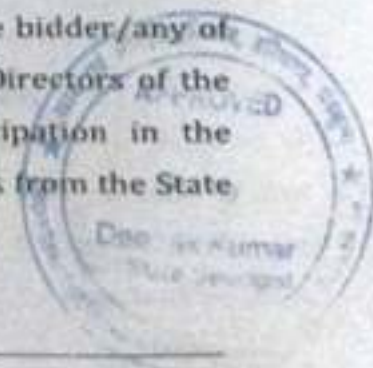
The important instructions for participation in the online e-Auction are as under:

- The bids shall be made online on the e-Auction web portal, link of which is available on website of the Department <https://minesharyana.gov.in/>.
- The intending bidders before participation in the e- Auction/bidding process will be required to create a User Account and to obtain a User-ID and Password for the e-Auction Platform by following the link given on the website of the Department of Mines and Geology, Haryana i.e.; minesharyana.gov.in,
- The intending bidders once registered/ having created the "User account" would not be required to get registered again.

Department of Mines and Geology, Haryana, 2nd Floor, D.H. Square, Plot No. 9, Sector 22, Panchkula

Page 1 of 20

4. On successful Registration a **Wallet** for the bidder will get created in the name of bidder/ intending bidder for keeping additional amount.
5. The detailed instructions for participation in e-Auction can be perused at "**Bidders Manuals**" attached as Annexure A. The copy of same can also be downloaded from link "**Download Manuals**" at e-Auction web portal.
6. The prospective/intending bidders having created user account shall upload following documents (in PDF format not exceeding limit of 10 MB for individual document)
 - i. **No-Dues-Certificate(s)** from the concerned Officer In-Charge(s) of the District Mining Office (s) or an affidavit sworn before any Magistrate to the effect that no amount of contract money, royalty, dead rent or surface rent is due in respect of any mining lease/contract or mineral concession held by him (or any of his family members) currently or in the past.
 - ii. **Copy 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;
 - iii. **A copy of the authority letter** by the Partnership Firm (where bidding entity is a partnership firm) or a copy of the resolution of the Board of Directors (BoD) of the Company (where bidding entity is a registered Company) in favor of the person (authorized representative) who shall be offering the bids online on behalf of the bidding entity.;
 - iv. **An affidavit by the authorized representative** of the bidding entity participating in the bid to the effect that the bidder/any of the partners of the partnership firm/any of the Directors of the Company have not been debarred from participation in the auction and from obtaining a mineral concession/s from the State of Haryana.



7. **Deposition of amount of Earnest Money Deposit (EMD): Earnest Money for participation in bidding process for any mining area/site/ unit/ block shall be equal to 10% of the reserve price rounded by an amount of Rs. 10,000/-**
8. The prospective bidders would have option to select one or more mines of their interest for participation in the auction and would have option to change the same before the last date for deposit of EMD.
9. The prospective bidders shall deposit lumpsum amount of EMD, which shall not be less than 10% of the highest amount of reserve price among the mines opted to be participated by the bidder.
10. The prospective bidders for participation in the bidding shall transfer (RTGS/NEFT) funds in lumpsum amount, to be deposited as EMD and other amount of bid security etc., online to the Escrow Account of the Department as per detail given below:

TYPE OF ACCOUNT: CURRENT ACCOUNT

Account No: DMGZ9999

MICR Code: 160751005

SWIFT BIC CODE: IDFBINBB

IFSC CODE: IDFB0010209

Note: All amount will be accepted in INR and refunds, if any, will also be in INR.

The prospective bidder is required to make single transaction for the EMD amount.

11. On successful transfer of lumpsum amount as EMD and other amount/s towards bid security etc. in the above said Account of the Department up to **07.09.2023 till 05:00 PM** and successfully verification [UTR 22 digits (in case of RTGS) or 16 digits (in case of NEFT) Verification on the e-Auction portal, as a part of e-Auction process] of the EMD deposited along with the prospective bidder having already submitted other documents as per clause 6 shall be eligible to offer further bid for mine.
12. In case the amount deposited is not verified (UTR Verification on the e-Auction portal) within stipulated time frame, the intending bidder will not be allowed to enter in e-Auction of mine(s)/block(s). In case of highest bidder of any of the mine, the amount equal to 10% of the reserve price rounded by Rs. 10,000/- will be deducted from the lumpsum EMD already deposited and such highest bidder will be able

to offer bids for further mines, if so desire, only in case the balance amount is equal or more than 10% of the reserve price of next mine selected for bidding. If the balance amount is less than the 10% of the reserve price of next mine selected for bidding, the bidder may add additional amount before commencement of bidding time for mine to participate in the e-auction.

13. **Process for Top-up of EMD from wallet of the bidder:** The prospective bidder, in addition to depositing EMD in the Account of the Department, may deposit and keep additional amount in his wallet, by clicking the link **"My Account"** available on top right corner on portal;

Note: It is clarified that amount of EMD to be deposited initially has to be deposited as per steps given in clause (10) above and in case of deposits (Top-up of EMD) in wallet by following payment gateway by clicking link **"My Account"**.

14. **Refund of the EMD**

On completion of the auction process of all the mines in this list, the amount of EMD of the un-successful bidders or balance amount of EMD out of lumpsum amount to the successful bidders, if any, would be refunded, provided the same is otherwise not ordered to be forfeited. The prospective bidders shall furnish details of their account for **refund of EMD** (a) Refund Account Name (b) Refund Account No. (c) IFSC code of the Bank.

Note: Please cross check the information to be submitted online before saving the same as the information is non-editable.

15. **Refund from the wallet:**

Bidder may request for refund by clicking on **'Request for Refund'** button available under the section **"My Account"** and will get refunded to his Refund Account.

16. **Deposition of amount of E-service fee for participation in the e-auction** the prospective bidders shall have to pay e-Service Fee/Administrative Charges of Rs. 11000/- plus GST online for each of the mine to participate in e-auction through Debit Card/Internet Banking by using the service of secure electronic payment gateway available on the e-Auction portal itself with the link titled as **'Pay Now'**.

The secure electronic payments gateway is an online interface between contractors and online payment authorization networks. The Payment for e-Service Fee/Administrative Charges of the bank can be made by eligible bidders/contractors online directly through **Debit Cards & Internet Banking Accounts**.

17. **Furnishing of wrong information or documents:** In case any of the information furnished for creation of User Account and/or any of the documents uploaded as above are found to be wrong/false at any stage during or after the e-Auction, the same shall be liable for action as under:

- i. The Department shall be entitled to invoke revocation/cancellation of bid;
- ii. The Department shall be entitled to forfeit the amount deposited (EMD or any other amount) at the time of auction;
- iii. Even in case, the false information/document is detected after the award of mineral concession, the Department shall be entitled to terminate the mineral concession.
- iv. The Department shall debar the bidder from participation in any subsequent auction for a period of 5 years.

18. **Information /training/ clarification/ difficulty for participation in the e-auction process:** In case of any query regarding process of e-Auction and for undertaking training, the intending bidder can contact **Help-desk support for e-Auction Portal** for offering Technical Support Assistance over telephone from Monday to Friday (**Exclusions: GAZETTED HOLIDAYS**) between **10:00 A.M to 06:30 P.M** as per details given below:

Following helpdesk No. shall be open between 10: 00 AM to 18:30 PM IST		
Contact Person	Email ID	Tel. No.
1. Ms. NeetiBala Chandra	neeti.bala@cIndia.com	+91-7291981128
2. Mr. Chandan Kumar	chandan.kumar@cIndia.com	+91-9015145373
3. Mr. Sandeep	sandeep@cIndia.com	+91-9050287464
4. Mr. SachinShrivastva	sachin.shrivastva@cIndia.com	+91-8750139866

Department of Mines and Geology, Haryana, 2nd Floor, DIII Square, Plot No. 9, Sector 22, Panchkula

In case the issue is not resolved by the above team, kindly contact on contact given below		
I. Mr. Mukesh Kumar	mukesh.kumar@c1india.com	+91-7291981127
Monday to Friday (Exclusions: Gazette Holidays)		
Dedicated centralized email id: auctions@c1india.com		

- i. The bidders may also send queries to the help-desk through e-mail by sending an email to auctions@c1india.com along with appropriate screenshots or error description.

19. Bidding Process:

Serial auction of mines: The mines shall be put-up for auction serially from top to bottom as per list notified in the Auction Notice.

- i. The bidding process shall start on **11.09.2023 at 10:00 AM**.
- ii. On the start of the bidding process, the name and the particulars of the mine at Sr. No. 1 to be put-up for e-Auction shall be displayed to the bidders.
- iii. The prospective bidder would be allowed to offer bids only in case the mine put to auction is selected for participation in bidding.
- iv. In case no bid is received during first 60 minutes after the commencement of bidding process the first round of auction of said mine/block offered shall conclude. The new mine/next in the Sr. no., from the list of mines being taken up for auction, would be offered for auction on 10:00 AM of the following day.
- v. If a bid/s is/are received during first 50 minutes but no bid is received during last 10 minutes of the auction (50 minutes to 60 minutes), the bidding shall be concluded by the system after 60 minutes of commencement of bidding.
- vi. In case a bid is received during last 10 minutes (50 minutes to 60 minutes) the auction shall be extended by blocks of 10 minutes till such time that no bid is received during the last extended block of 10 minutes. Thus, the bidding shall be concluded when no bid has been received in the last 10-minute extended block.

Note: To illustrate, if a bid is received in say, the 55th minute, the bidding process shall extend by 10 minutes from 60 to 70 minutes. If a bid is now received, say in the 69th minute, the bidding process shall again get extended for another block of 10 minutes from 70 to 80 minutes. If

no bid is received from 70 to 80 minutes the bidding process will conclude after expiry of 80 minutes.

- vii. **Fresh Round of auction for unsuccessful mines:** The mines which fail to attract bidders during first round of auction, completed serial wise, shall again be offered for e-auction for second time to explore the possibility of attracting bidders.

Note: To illustrate say there are total 02 mines offered/notified for auction. The mine at Sr. no 1 fails to attract any bid during first 60 minutes and the auction gets concluded as explained in Sub Clause (iv) above. The mine at Sr. no 2 will be offered for e-auction/bidding on next day (day two). Finally, after concluding auction process for all mine in serial, the mine says at Sr. no 1 which failed to attract bidders in first round will be again offered for bidding. The same process will be followed for any other mine which fails to attract bid in first round.

- viii. **Incremental amount:** Minimum incremental bid amount shall be Rs. 5,00,000/- and its multiples.
- ix. **Auction without any break:** Auction of any mine that has started at 10:00 AM shall be completed, without any break, irrespective of the number of days taken in the process.
- x. **Auction of new mine on following day of conclusion of auction:** Any new mine, from the list of mines being taken up for auction, would be offered for auction on 10:00 AM of the following day on which the ongoing auction of last mine was/ is concluded.
- xi. **Confidentiality of bids/Display of the bids:** All bidding participants shall be able to view the quoted highest bid value during online bidding process and they will be able to have details of all of their own quoted bids at their end. However, the names/identity of any of bidder in any manner will not be accessible to anyone during auction.
- xii. **Payment of balance amount of initial bid security by highest bidder:**

On conclusion of the bid/auction for any particular mine, a system generated confirmation of highest bid offered by the highest bidder shall be sent automatically on the registered email and SMS will be sent on the registered mobile number, directing the highest bidder

to deposit an amount equal to 10% of the highest bid after adjusting the EMD deposited for said mine/ block, as 'Initial Bid Security' within 24 hours of such confirmation. The payment has to be made through RTGS/NEFT mode (as process mentioned in clause 10). The payment is required to be made into Department's account directly and a 22 digits (in case of RTGS) or 16 digits (in case of NEFT) UTR number will be required to be verified through the option available on portal for Verification of UTR by the highest bidder. Further, it may also be noted that the highest bidder is not allowed to adjust the amount available in the wallet for payment of difference account. The highest bidder is required to make a single independent transaction for the balance amount.

- xiii. In case the highest bidder of preceding mine has funds available in Account (after retention of amount equal to EMD for his successful bid by the Department) equal to EMD for any subsequent mine being offered for auction, he may opt for participation in the bidding like any of the other bidders.
- xiv. **Non-payment of balance amount of initial bid security by the highest bidder:** In case the bidder is not able to deposit the initial bid security within period allowed as above, the EMD shall be forfeited and he shall be debarred for 5 (five) years to participate in any further/future auction.
- xv. **Prospective Effect of Debarment:** The highest bidder of any mine, may participate in subsequent bids for other mine/s in the auction list during the period of 24 hours provided he pays the balance amount towards initial bid security for earlier highest bid. The following scenarios may emerge:
- The bidder fails to deposit the balance amount for the first mine for which he was the highest bidder. The EMD for the mine in question shall be forfeited and he shall be debarred from participating in future auctions for a period of 5 years. The system shall block the bidding by this bidder in all ongoing/ subsequent bids. Any other highest bids offered subsequently by the bidder thus debarred shall automatically stand cancelled.
 - The bidder deposits the balance amount for the first mine for which he was the highest bidder but fails to deposit the

balance amount for the subsequent mine for which he was also the highest bidder. The bid for the first mine shall be accepted. The EMD for the mine for which the balance amount was not deposited shall be forfeited and the bidder shall be debarred from participating in future auctions for a period of 5 years.

XVI. Refund of EMD: After the completion of the bidding process the EMD amount of the unsuccessful or any balance amount of the highest bidder after adjustment of amount to be deposited, would be refunded/transferred to the account of the bidders on conclusion of the auction process. The unsuccessful bidder may request for refund through "Refund EMD" available under "My Account" section.

20. The details of the areas of the Mining Units along with reserve price and period of mining contract, are given below:

Sr. No.	Name of Unit	Name of the Village	Details of Khuzra Nos.	GPS reading of all corner point taken by ISARLAC by using DGPS			Area (in acre) as per Revenue record		Total Mineral Concentration Area (in acre)	Reserve Price (in crore)	Period
				Filter	Latitude	Longitude	Area	Surplus for mining activity			
1	2	3	4	5			6	7	8	9	10
1	Pharwadpur	Pharwadpur	For Mining 1// 11 min, 12, 13, 14, 16, 17, 18, 19, 20 min, 21 min, 22, 23, 24, 25 3// 10, 11, 20, 21, 22 4// 1/1, 1/2, 2, 9, 10, 11, 12, 19, 20, 21, 22 5// 1 min, 2, 3/1, 3/2, 4, 5, 6, 7, 8, 9, 10 min, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20 min, 21 min, 22, 23, 24, 25 6// 2/1, 2/2, 3/1, 3/2, 4, 5, 6/1, 6/2, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18/1, 18/2, 19/1, 19/2, 20, 21, 24/1, 24/2, 25 9// 1, 2, 9, 10, 11/1, 11/2, 12, 19/1, 19/2, 20, 21, 22, 40/1, 1, 2, 9, 10/1, 10/2, 11, 12, 19, 21, 22 11// 1 min, 3, 4, 5/1, 5/2, 6, 7, 8, 9 min, 10 min, 11, 14, 15, 16, 17, 18, 19/1 min, 20 min, 24, 25 13// 1 min, 4, 5, 6, 7 min, 14/1 min, 14/2 min, 25 min, 10 min, 25 min 18// 1, 10, 11/1, 11/2, 21 min	T 28° 26' 16.406" N 77° 28' 55.362" E U 28° 26' 21.317" N 77° 28' 56.774" E V 28° 26' 27.209" N 77° 28' 45.990" E W 28° 26' 30.657" N 77° 28' 43.812" E X 28° 26' 33.828" N 77° 28' 43.442" E Y 28° 26' 36.689" N 77° 28' 43.278" E Z 28° 26' 32.178" N 77° 28' 42.985" E	182.41	00	247.87	13.44	10		
			Garwall	For Mining 7// 7 min, 14 min, 17 min, 18, 23, 24 min 8// 1, 1/1, 1/2 min, 7 min, 8, 12, 13, 14 min, 17 min, 18, 19, 22, 23, 24 min 15// 1, 4 min, 7/2 min, 8, 10 min, 10 min, 19, 22, 23 min, 21// 1 min, 11, 14 min, 17 min, 24 min, 25 min 18// 1, 2 min, 4, 5/1 min, 5/2 min, 14 min, 15 min, 15, 16, 17 min, 25 min 24// 10 min, 11 min, 13 min, 20, 21, 22 min 28// 1 min, 2, 9 min, 10 min, 11 min, 12, 13, 14 min, 17 min, 18, 19, 24 min, 25 min	A 28° 26' 31.355" N 77° 29' 4.849" E B 28° 26' 29.809" N 77° 29' 4.109" E C 28° 26' 32.400" N 77° 29' 1.609" E D 28° 26' 30.000" N 77° 29' 4.000" E E 28° 26' 25.440" N 77° 29' 2.914" E F 28° 26' 33.969" N 77° 29' 10.100" E G 28° 26' 4.100" N 77° 29' 20.100" E H 28° 26' 32.500" N 77° 29' 23.600" E I 28° 26' 36.718" N 77° 29' 26.272" E J 28° 26' 34.200" N 77° 29' 25.965" E K 28° 26' 32.465" N 77° 29' 13.564" E L 28° 26' 37.838" N 77° 29' 15.229" E	141.38	13.47				



			<p>22, 23, 24 min, 25 min 41// 2 min, 3, 4, 5 min, 6 min, 7, 8, 9 min, 12 min, 13, 14, 15, 16, 17/1, 17/2, 18, 19 min, 20 min, 23, 24, 25 42// 11 min, 20 min, 21 min 48// 1 min, 10 min, 11 min, 20 min, 21 min 49// 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12 min, 13, 14, 15, 16, 17, 18, 19 min, 22 min, 23, 24, 25 81// 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12/1 min, 12/2 min, 13, 14, 15, 16, 17, 18, 19 min, 22 min, 23, 24, 25 82// 1 min, 10 min, 11 min, 20 min, 21 min 86// 1 min 87// 2 min, 3, 4, 5, 6, 90 min</p> <p>For Auxiliary area 33// 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 25 38// 1, 2, 3, 4, 5, 7, 8, 9, 12/1</p>	<p>M 28° 41.802' N 77° 29' 16.100' E N 28° 42.132' N 77° 29' 14.200' E O 28° 42.530' N 77° 29' 13.677' E P 28° 43.019' N 77° 29' 13.240' E Q 28° 43.349' N 77° 29' 13.000' E R 28° 43.644' N 77° 29' 12.700' E S 28° 43.860' N 77° 29' 12.450' E</p>						
		Chandigarh (North)	<p>For Mining 66// 6, 7, 14, 15 min, 16 min, 17, 24, 25 min 67// 10 min, 77// 8, 9 min, 6 min, 7, 201 min</p>	<p>U 28° 7' 21.813' N 77° 29' 12.000' E A1 28° 7' 22.476' N 77° 29' 23.1000' E</p>	2851	0				
2	Chandigarh South	Chandigarh (South)	<p>For Mining 77// 14, 15 min, 16 min, 17, 24 min, 25 min 187// 4 min, 7 min, 14 min, 25 min, 16 min, 17, 24, 25 min, 115// 1, 2 min, 10 min, 11 min, 12 min, 19 min, 20, 23, 22 min, 116// 1, 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 23, 24, 25; 146// 1, 3, 4, 5, 6, 7, 8, 9, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20 min, 21 min, 22, 23, 24, 25, 147// 1, 2 min, 3 min, 11 min, 9, 10, 11, 12, 13 min, 17 min, 18, 19, 20, 23, 22, 23, 24 min 151// 10 min, 11 min, 12 min, 13 min, 10 min, 19, 20, 21, 22, 23, 24 min 152// 17, 18, 19, 20, 21 min, 22 min, 23, 24, 25 153// 1 min, 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12 min, 13 min, 14, 15, 16, 17 min, 18 min, 19 min, 25 min 181// 2 min, 3 min, 4, 5, 6, 7, 8 min, 13 min, 14, 15, 16, 17, 18 min, 23 min, 24, 25 183// 1, 2, 3, 4 min, 5 min, 6 min, 7, 8, 9, 10, 11, 12, 13, 14, 15 min, 16 min, 17, 18, 19, 20, 21, 22, 23, 24, 25, 186// 1, 2, 3, 4, 5 min, 6 min, 7, 8, 9, 10, 11, 12, 13, 14, 15 min, 16 min, 17, 18, 19, 20, 21, 22, 23, 24, 25 min 187// 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12 min, 13, 14, 15, 16, 17, 18, 19 min, 21 min, 22 min, 23, 24, 25, 215// 16 min 214// 1 min, 2, 3, 4, 5, 6, 7, 8, 9, 10 min, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 min, 22 min, 23, 24, 25 217// 1, 2, 3, 4, 5 min, 6 min, 7 min, 8, 9, 11, 12, 13, 14 min, 17 min, 18, 19, 20, 21, 22, 23 min 220// 1, 2 min, 3 min, 4 min, 10 min 221// 1 min, 4 min, 5, 6 min 283 min</p> <p>For Auxiliary area 195// 21, 22, 23, 24, 25 198// 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15</p>	<p>Pillar Latitude Longitude A1 28° 7' 22.476' N 77° 29' 23.1000' E B1 28° 7' 15.632' N 77° 29' 21.042' E C1 28° 4' 51.224' N 77° 29' 20.109' E D1 28° 4' 49.860' N 77° 29' 45.677' E E1 28° 4' 46.999' N 77° 29' 50.960' E F1 28° 4' 29.509' N 77° 29' 55.700' E G1 28° 4' 33.250' N 77° 29' 56.413' E H1 28° 4' 25.790' N 77° 29' 51.500' E I1 28° 4' 19.007' N 77° 29' 46.534' E J1 28° 4' 15.57' N 77° 29' 26.67' E K1 28° 4' 12.16' N 77° 29' 24.65' E M1 28° 4' 31.700' N 77° 29' 29.710' E N1 28° 4' 41.015' N 77° 29' 33.990' E O1 28° 4' 45.131' N 77° 29' 32.411' E P1 28° 4' 46.154' N 77° 29' 24.470' E Q1 28° 4' 48.813' N 77° 29' 18.139' E R1 28° 4' 52.236' N 77° 29' 16.016' E S1 28° 4' 55.886' N 77° 29' 13.561' E T1 28° 4' 39.260' N 77° 29' 10.000' E U1 28° 7' 27.000' N 77° 29' 9.657' E V1 28° 7' 13.205' N 77° 29' 12.790' E W1 28° 7' 18.063' N 77° 29' 12.917' E X1 28° 7' 22.419' N 77° 29' 12.000' E Y1 28° 4' 33.417' N 77° 29' 6.010' E</p>	228.05	17.34	245.29	10.44	00	
3	Kashipur	Kashipur	<p>For Mining 58// 9, 10 min, 11 min, 12 min, 19 min, 19, 20 min, 23, 22, 23 min 67// 25 min 69// 1, 2, 3 min, 4 min, 5, 16, 14, 15, 16 min, 10 min, 19, 20, 21 68// 5 min, 6 min, 14 min, 15</p>	<p>Pillar Latitude Longitude U 28° 4' 27.100' N 77° 31' 23.100' E V 28° 4' 22.613' N 77° 31' 20.913' E T 28° 4' 17.100' N 77° 31' 18.077' E X 28° 4' 16.709' N 77° 31' 27.670' E Y 28° 4' 12.219' N 77° 31' 23.570' E</p>	22.97	14.4	209.06	1.84	00	



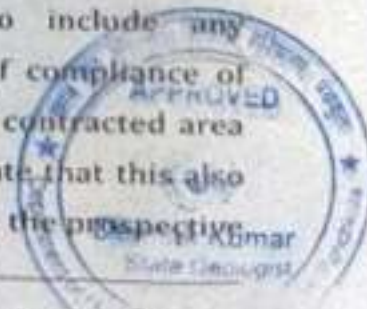
Block	For Mining	Pillar	Latitude	Longitude	Area	No.			
							For Auxiliary area		
Forstabil-nagar	16// 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	F1	28° 43' 00.00" N	77° 31' 25.000" E	44.48	18.78			
	For Auxiliary area	G	28° 43' 00.00" N	77° 31' 25.000" E					
	For Mining	H	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	I	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	J	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	K	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	L	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	M	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	N	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	O	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	P	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	Q	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	R	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	S	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	T	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	U	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	V	27° 57' 37.71" N	77° 32' 1.91" E					
	Hauzarpur	118// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	F1	27° 57' 37.71" N			77° 32' 1.91" E	37.31	8.78
		For Auxiliary area	H	27° 57' 37.71" N			77° 32' 1.91" E		
For Mining		I	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		J	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		K	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		L	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		M	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		N	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		O	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		P	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		Q	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		R	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		S	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		T	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		U	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		V	27° 57' 37.71" N	77° 32' 1.91" E					
For Mining		W	27° 57' 37.71" N	77° 32' 1.91" E					
Mubail		84// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	F1	27° 57' 37.71" N	77° 32' 1.91" E	24.85	9.8		
		For Auxiliary area	H	27° 57' 37.71" N	77° 32' 1.91" E				
	For Mining	I	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	J	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	K	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	L	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	M	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	N	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	O	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	P	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	Q	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	R	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	S	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	T	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	U	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	V	27° 57' 37.71" N	77° 32' 1.91" E					
	For Mining	W	27° 57' 37.71" N	77° 32' 1.91" E					



				Sl. No.	Sl. No.				
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21. The terms and conditions of the Auction:

- i) The period of contract shall commence w.e.f. the date of grant of the Consent to Operate (CTO) by the State Pollution Control Board followed by Environmental Clearance by the Competent Authority, or on expiry of the period of 12 months from the date of issuance of Lol, whichever is earlier.
- ii) Any site/area/ mine offered for auction can be withdrawn from the Auction without assigning any reason;
- iii) Due care has been taken in specifying the details of the areas of the mining blocks. However, in case of any inadvertent clerical mistake in area detail/Khasra number etc., the same shall be got rectified/corrected even after the completion of the auction but before execution of contract agreement;
- iv) The contract areas are Tentative and are being notified on 'as is where is' basis and all prospective bidders are expected and presumed to have surveyed the areas to make their own assessment for the potential of the areas for which bids are to be offered.
- v) The bidders are expected and presumed to have 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 in land/area or any other loss to the bidders/contractors 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.
- vi) No request regarding reduction in bid amount on account of reduction in land/area of the Mining Block, on any 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 above and the prospective



Department of Mines and Geology, Haryana, 2nd Floor, B.H. Square, Plot No. 9, Sector 22, Panchkula

Page 12 of 28

- bidder shall give their bids taking account of all such eventualities;
- vii) No person shall be eligible to participate in the Auction, who or any of his family members is a defaulter of any mining dues in respect of any mineral concession granted in the past or any other current mineral concession. In case any of the partners of a Partnership Firm or a Director of a company participating in the auction process or any of their family members are found to be defaulter, the bidder firm/company would be held ineligible. Further, any person, firm or company as the case may be who had been specifically debarred to participate in the auction would not be eligible to participate in the auction;
- viii) In case any bidder participated in the auction is found to be default in arrears of government dues on account of any mineral concession obtained from the State of Haryana at any stage, his bid shall be revoked/cancelled with forfeiture of the amount deposited in order to obtain the said mine on contract;
- ix) All intended participant can view the highest quoted bid during online bidding process. The highest bidder will be informed for confirmation of the same through e-mail and SMS alert at his online registered email and Mobile Number respectively on the conclusion of the respective mine;
- x) The highest bid received/quoted shall become the 'annual contract money' amount payable by the bidder/contractor. The amount of annual contract money initially determined on the basis of competitive bids/auctions shall be increased by 10% on completion of each block of three years; for every three years.
- Explanation:** If the initially determined annually bid/ contract money is Rs. 100/-, it shall be increased to Rs. 110/- with the commencement of the fourth year and to Rs. 121/- with the commencement of the 7th year and so on and so forth for the next each block of three years.
- xi) The highest bidder would be informed about the same- confirmation that he being declared as highest bidder- as per which he shall be liable to deposit 25% of the annual bid/ contract money amount as "security" and one month's advance contract money. The above said amount shall be deposited as per following schedule:

Department of Mines and Geology, Haryana, 2nd Floor, DHI, Square, Plot No. 9, Sector 22, Panchkula

- i. an amount equal to 10% of the annual bid amount/ highest bid, after adjusting the EMD deposited for said mine/ block, as 'initial bid security' within 24 hours of conclusion of the bidding process as per details given in clause 19 (xii).
- ii. balance amount of bid security i.e. 15% of an annual bid amount 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 where the Letter of Intent holder/contractor having taken all steps on his part, 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
<p>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.</p>		

- xii) In case the highest bidder fails to deposit 10% of the annual bid amount online towards the "Initial bid Security" within 24 hours given for the same, the earnest money deposited shall stand forfeited.

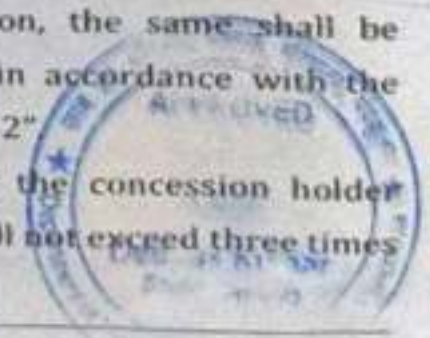
- Further such bidder(s) shall not be eligible to participate in any future auctions/Tenders/ competitive bidding process in respect of any area for obtaining mineral concession in the State for a period of 5 years;
- xiii) The bids offered/received during the e-auction process shall be provisionally accepted and shall be regarded as successful bid only after acceptance by the State Government;
- xiv) The LOI would be issued through e-auction portal/online itself on registered e-mail of the bidder, after validating all the documents and approval from the State Government.
- xv) After deposit of 10% of the bid amount (as initial bid security) after the conclusion of auction by the highest bidder(s), no request from the highest bidder(s) regarding revocation or the withdrawal of the highest bid shall be considered. In case, any such request is made, the same shall be followed by the Penal Action i.e. 10% amount deposited towards initial bid security shall stand forfeited and such bidder(s) shall 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;
- xvi) The earnest money deposited by the bidders other than highest bidders shall be refunded upon completion of the auction proceedings;
- xvii) After the acceptance of highest bid by the State Government and on issuance of Letter of Intent, the LoI holder shall execute an agreement in **Form MC-I** appended to the 'Haryana Minor Mineral Concession, Stocking, Transportation of Minerals and Prevention of Illegal Mining Rules, 2012' within a period of 90 days of the order of grant of LoI;
- xviii) The agreement executed shall be got duly registered under relevant law with concerned Registering Authority and they shall be liable to pay applicable stamp duty and registration fee etc. as per the applicable rates and demanded by the Registering Authority/Revenue Department.
- xix) In case of failure to execute the agreement, after issuance of acceptance of bid/LOI within prescribed period of 90 days from the date of issuance of LOI, the acceptance/LOI shall be deemed to have been revoked and 10% amount deposited towards "initial bid security" shall stand forfeited and such bidder shall 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.;

- xx) After execution of agreement, either before commencement of the mining operation or before expiry of the time allowed, if any, as per clause 21(xi)(b) above, in case of failure to deposit the balance 15% amount towards security (as required under clause 21(xi)(b) above) the acceptance of bid/issuance of Lol/execution of agreement shall be deemed to have been revoked and 10% amount deposited towards initial bid security after the conclusion of auction shall stand forfeited. Further, such bidder shall 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.
- xxi) In case of default as per clause 17(IV) and 19 (XIV) above, wherever the bidder/contractor are debarred from participation in future auctions/tenders/competitive bidding process, it may be noted that in case of such default by a company, the said company and all of its Promoter/s and Director/s, in case of Partnership Firm along with such firms and all of its partners shall be debarred from participation whether individually or as partner/ proprietor/director in a company in bids for the period prescribed.
- xxii) 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'
- xxiii) 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'.
- xxiv) The contractor shall be liable to pay advance Income Tax as per provisions of Section 206 (c) of the Income Tax Act, in addition to the contract money payable as per terms and conditions of the contract agreement;
- xxv) On enhancement of the contract money by 10% with expiry of every three years period, the contractor shall deposit the balance amount of security so as to upscale the security amount equal to 25% of the

revised annual contract money as applicable for one year with respect to the next block of three years;

- xxvi) No interest, whatsoever, shall be payable on the security amount deposited under proper security head of the government;
- xxvii) The Lol holder/contractor shall also furnish a solvent surety for a sum equal to the amount of the annual bid for execution of the agreement. In case the surety offered by the contractor(s) during the subsistence of the contractor is not found solvent, the contractor (s) shall offer another solvent surety and a supplementary deed to this effect shall be executed;
- xxviii) The mining contractor shall get prepared 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 mining area granted on contract and shall get the same approved by an officer authorized by the Director, Mines & Geology, in this behalf.
- xxix) The contractor / Lol holder shall obtain prior Environmental Clearance for the Mining block(s)/area from Competent Authority as required under notification dated 14/09/2006 issued by the MoE&F, GoI or as amended from time to time and also other required approvals for mining including Consent to Establish and Consent to Operate before commencement of actual mining operations;
- xxx) 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.
- xxxi) 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"
- xxxii) 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 at any point of time.

- xxxiii) 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";
- xxxiv) 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 an 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;
- xxxv) The 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 3 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. In case of 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 on either side of all other rivers/ rivulets in case of river Yamuna. (This clause is applicable for

- mining outside riverbed area);
- 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 riverbeds.
- vii. No mining operation may be carried out from 1st July to 15th September, every year (rainy season)
- xxxvi) 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;
- xxxvii) 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.
- xxxviii) 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;
- xxxix) 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, Forest (Conservation) Act, 1980 and Environment (Protection) Act, 1986 and the rules made there under Wild Life (Protection) Act, 1972, Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981;
- xl) Further information, if any required, can be had on any working day from the office of the Mining Officer, Mines & Geology Department, Faridabad/Palwalor from the O/o the Director, Mines and Geology, Haryana, DHL Square, Plot No 9, IT Park, Sector 22, Panchkula, Haryana.


 Director,
 Mines & Geology, Haryana.



Department of Mines and Geology, Haryana, 2nd Floor, DIII, Square, Plot No. 9, Sector 22, Panchkula

Annex-2

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 Apex Project works,
Through Sh. Upendra Kumar, Shop No. 1, Manjeet filling Station,
Near Yamuna Pul, Village Manglora, Distt. Karnal, 132001 Haryana

Memo No. DMG/HY/Chandhut (South) Sand Unit/Palwal/2023/5724
Dated Panchkula, the 5/10/2023

Subject: Acceptance of the highest bid in respect of the minor mineral Sand contract of "Chandhut (South) Unit" having tentative area of 245.39 Acre in the district Palwal, offered in e-auction held on 12.09.2023/issuance of Letter of Intent (LoI)- regarding.

You participated in the e-auction held on 12.09.2023 on the e-Auction web portal (<https://minesharyana.cauctions.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/2022/4433 dated 07.08.2023 in order to obtain mining contract of minor mineral sand mine of the district Palwal.

2. You offered the highest bid of Rs. 13,19,00,000/- (Rs. Thirteen Crores Nineteen Lakhs only) per annum against the Reserve Price of Rs. 13,14,00,000/- for obtaining the Mining Contract of Minor Mineral Mine namely 'Chandhut (South) Unit' for extraction of 'Sand' having total area of 245.39 Acre. 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. 13,19,00,000/- per annum offered by you in respect of 'Chandhut (South) 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 has accepted the aforementioned highest bid of Rs. 13,19,00,000/- 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 'Chandhut (South) Unit' subject to the following terms and conditions:

4.1 The period of the contract shall be 10 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. 21 (iv) 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. 21 (iii) 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. 21 (vi) 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. 13,19,00,000/- (Rs. Thirteen Crores Nineteen 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	13,19,00,000
2	Second Year	13,19,00,000
3	Third Year	13,19,00,000
4	Fourth Year	14,50,90,000
5	Fifth Year	14,50,90,000
6	Sixth Year	14,50,90,000
7	Seventh Year	15,95,99,000
8	Eighth Year	15,95,99,000
9	Ninth Year	15,95,99,000
10	Tenth Year	17,55,58,900

4.7 As per the terms and conditions of the grant, you are liable to deposit Rs. 3,29,75,000/- i.e. equal to 25% of the annual bid amount as "Security" out of which you have already deposited an amount of Rs. 1,31,90,000/- (Rs. One Crore Thirty One Lakhs Ninety 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. 1,97,85,000/- 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;

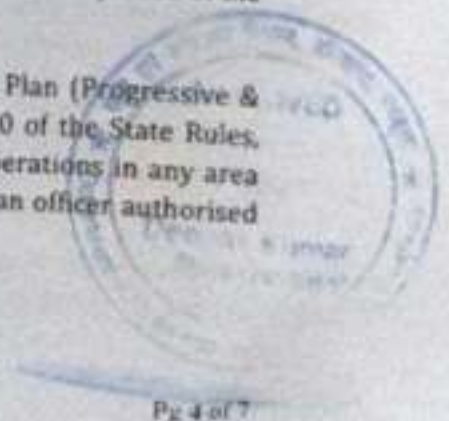
4.10 The Contract Agreement executed shall be got duly Registered under relevant laws with concerned Registering Authority and you will be liable to pay applicable stamp duty and registration fee etc. as per the applicable rates and as demanded by the Registering Authority/Revenue Department at the time 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 Agreement. The documents in support of solvency of the surety shall be submitted duly evaluated as per current Collector Rates by the concerned Revenue Authority along with Non Encumbrance Certificate from the concerned Revenue Authority. In case, the surety offered by the For execution of 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.

Further, Surety will submit an affidavit to the effect that the property in question has not been offered as surety to the department of Mines and Geology, Haryana in some other case.

- 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 Lol/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 be barred 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 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 Lol 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 License 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;

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 there under 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 Lol.


Director
Mines & Geology, Haryana


Speed/Registered Post

Endst. No. DMG/HY/Chandbut (South) Sand Unit/Palwal/2023/

Dated

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

1. Additional Chief 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.


Director
Mines & Geology, Haryana

Annexure A

Sr. No.	Name of Unit	Name of the Village	Details of Khasra Numbers	Area in acre as per revenue record	Total Mineral Concession Area (in acre)	Period (in years)
1	Chandhan South	Chandhan South	For Mining 277// 18, 15 min, 16 min, 17, 14 min, 25 min, 187//, 4 min, 7 min, 14 min, 15 min, 16 min, 17, 24, 25 min, 115//, 1 min, 10 min, 11 min, 12 min, 15 min, 26, 21, 22 min, 116//, 1, 4, 5, 6, 7, 8, 11, 14, 15, 16, 17, 18, 23, 24, 25, 26//, 1, 4, 5, 6, 7, 8, 9, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20 min, 21 min, 22, 23, 24, 25, 147//, 1, 2 min, 3 min, 8 min, 9, 10, 11, 12, 17, 18 min, 19, 20, 21, 22, 23, 24 min 151//, 10 min, 11 min, 12 min, 13 min, 14 min, 18, 20, 21, 22, 23, 24 min 152//, 13, 16, 19, 18, 21 min, 22 min, 23, 24, 25 153//, 1 min, 2 min, 3, 4, 5, 6, 7, 8 min, 17 min, 23 min, 24, 25, 16, 17 min, 18 min, 24 min, 25 min, 182//, 2 min, 3 min, 5, 6, 7, 8 min, 13 min, 14, 15, 16, 17, 18 min, 23 min, 24, 25 183//, 1, 2, 3, 4 min, 5 min, 6 min, 7, 8, 9, 10, 11, 12, 13, 14, 15 min, 16 min, 17, 18, 19, 20, 21, 22, 23, 24, 25 184//, 1, 2, 3, 4, 5 min, 6 min, 7, 8, 9, 10, 11, 12, 13, 14, 15 min, 16 min, 17, 18, 19, 20, 21, 22, 23, 24, 25 min, 187//, 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12 min, 13, 14, 15, 16, 17, 18, 19 min, 21 min, 22 min, 23, 24, 25, 213//, 16 min 214//, 1 min, 2, 3, 4, 5, 6, 7, 8, 9, 10 min, 13 min, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 min, 22 min, 23, 24, 25 217//, 1, 2, 3, 4, 5 min, 6 min, 7 min, 8, 9, 10, 11, 12, 13, 14 min, 17 min, 18, 19, 20, 21, 22, 23 min 229//, 1, 2 min, 3 min, 4 min, 10 min, 225//, 3 min, 4 min, 5 min 243 min. For Auxiliary area 105// 21, 22, 23, 24, 25 110// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	128.95	143.34	18



GSTIN :
PAN :



MOE. +91 98128 44250
E-mail : vipin.shrm001@gmail.com

APEX PROJECT WORKS

H OFFICE :
Shop No.-1, Manjeet Filling Station,
Near - Yamuna Pul, Vill - Manglora
Distt - Karnal -1322001 (HR)

SITE ADDRESS :
Att - Chandhut South Block,
Distt - Palwal, Haryana

CONSENT LETTER FROM APPLICANT (Annexure-3)

The mining plan in respect of M/s Apex Project works, through Sh. Upender Kumar, Shop No.1, Manjeet Filling Station, Near Yamuna Pul, Village Manglora, District Karnal,132001 (Haryana) for the Sand quarries of Chandhut (South) Unit, over an area of 245.39 acres in District- Palwal State -Haryana is being prepared by Dr. S.N.Sharma & D.C.Yadav RQPs .

We request The Director Mines and Geology, Haryana to make further correspondence regarding modification of the mining plan with the said RQPs on the following address:-

D.C.Yadav RQP/DMG/HRY/2018/03.& Sh.S.N.Sharma (Qualified Person)


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 RQPs 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.

Thanking You,

For M/s  Apex Project Works

Approved
11/11
Authorized Signatory

Amended 11/2

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

(Signature)
 (Sanjay Kumar) Director,
 Mines & Geology, Haryana,
 Chandigarh.





छद्म योग्य तैयार करने हेतु
योग्य व्यक्ति के रूप में
मान्यता का प्रदान करना

Renewed/नवीनीकरण up to 29/3/2021
Amended (11)

Schoofy
28/3/11
क्षेत्रीय खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
Indian Bureau of Mines

(खनिज रियायत विन्यासही 1960 के नियम 22(डी) के अंतर्गत)

की एस. एन. शर्मा

पत्त श्री के. सी. शर्मा

निवासी हाउस नं 2181, सेक्टर-16, फरीदाबाद, हरियाणा

द्वारा अपनी योग्यताओं और अनुभव का संतोषजनक प्रमाण प्रस्तुत करने के कारणवश
खनिज रियायत विन्यासही, 1960 के नियम 22(डी) के अंतर्गत उन्हें एतद्वारा छद्म
योग्य तैयार करने हेतु योग्य व्यक्ति के रूप में मान्यता प्रदान की जाती है।

उनका पंजीयन क्रमांक RAP/DDN/135/2001/A है।

यह मान्यता दिनांक 29.03.2011 को समाप्त

होने वाली है।

स्थान : देहरादून
दिनांक : 30.03.2001

Sharma
क्षेत्रीय खान नियंत्रक
भारतीय खान ब्यूरो
Regional Controller of Mines
भारतीय खान ब्यूरो
Indian Bureau of Mines



Am-5.

INDEX

Sr.No.	Description	Page No.
1	The Project	1
1a	Object of Replenishment Study	2
2	Period of Replenishment Study	2
3	Need for present annual Replenishment Study	2
4	Experts Deployed	2
5	Software & Equipment Deployed	3
6	Replenishment Study	3-5
6.1	General Information	3-5
6.2	Physiography	5
6.3	Drainage	6
6.4	Sedimentation, Assessment & Infrastructure	6-8
7	Approach & Methodology	8-14



SUBJECT: REPORT ON REPLENISHMENT STUDY FOR RIVER BED MINING PROJECT OF MINOR MINERAL SAND OF CHANDHUT(SOUTH) BLOCK, DISTRICT : PALWAL (HARYANA) OF M/s Apex Project works, through Sh. Upender Kumar, Shop No.1, Manjeet Filling Station, Near Yamuna Pul, Village Manglora, District Karnal,132001 (Haryana)

References:

- Letter of Intent (LOI) : A Letter of Intent (LOI) has been issued by the Director Mines & Geology Haryana vide letter no. DMG/HY/Chandhut (South) Unit/Palwal/2023/5727 dated 05-10-23 for Mining of Sand (Minor Mineral) in Chandhut (South)Unit , over an area of 245.39 acres (98.156 hectares) in district Palwal, Haryana for a period of 10 years

- **The Project :**

- MINOR MINERAL SAND OF CHANDHUT(SOUTH) BLOCK, DISTRICT : PALWAL(HARYANA) OF M/s Apex Project works, through Sh. Upender Kumar, Shop No.1, Manjeet Filling Station, Near Yamuna Pul, Village Manglora, District Karnal,132001 (Haryana)
- Sand (Minor Mineral) in Chandhut (South)Unit , comprising Chandhut (South) village over an area of 245.39 acres (98.156 hectares) in district Palwal, Haryana for a period of 10 years It forms a part of G. T. Sheet No's 53 H/8,12 . The area is approachable from nearest town of Palwal, Faridabad, Hodal and Hassanpur. These are located about from 17 Kms east of Palwal City. All these quarries are connected by metalled road branching off from GT road NH-2 and road connecting Alawalpur Hassanpur-Palwal via Chandhut (and up to the river quarries .



Co-ordinates of the lease area as under

Block Name	Name of Village	Pillar	Latitude	Longitude
Chandhut (South)	Chandhut	A1	28° 7' 22.4796" N	77° 29' 23.3988" E
		B1	28° 7' 15.652" N	77° 29' 21.692" E
		C1	28° 6' 51.324" N	77° 29' 38.139" E
		D1	28° 6' 49.868" N	77° 29' 45.677" E
		E1	28° 6' 46.099" N	77° 29' 50.988" E
		F1	28° 6' 39.589" N	77° 29' 55.700" E
		G1	28° 6' 33.250" N	77° 29' 54.415" E
		H1	28° 6' 25.798" N	77° 29' 51.588" E
		I1	28° 6' 19.887" N	77° 29' 46.534" E
		J1	28° 6' 15.97" N	77° 29' 36.67" E
		L1	28° 6' 22.16" N	77° 29' 24.65" E
		M1	28° 6' 31.708" N	77° 29' 29.316" E
		N1	28° 6' 43.035" N	77° 29' 33.998" E
		N2	28° 6' 45.131" N	77° 29' 32.411" E
		N3	28° 6' 46.154" N	77° 29' 24.476" E
		O1	28° 6' 48.827" N	77° 29' 18.139" E
		O2	28° 6' 52.236" N	77° 29' 14.026" E
		P1	28° 6' 55.886" N	77° 29' 11.661" E
		P2	28° 6' 59.260" N	77° 29' 10.000" E
		Q1	28° 7' 2.766" N	77° 29' 9.457" E
R1	28° 7' 13.205" N	77° 29' 12.799" E		
R2	28° 7' 18.063" N	77° 29' 12.912" E		
S1	28° 7' 22.419" N	77° 29' 12.698" E		

Objective for Replenishment Study

The Mining Plan & Progressive Mine Closure Plan has already been prepared. Department of Mines & Geology Haryana has advised to prepare and submit the replenishment study report along with the Mining Plan for approval. Although it is a fresh lease for which LOI was issued recently and replenishment could only be measured/assessed after mining up to 15th June and then replenishment by rainy water during rainy season up to 15th Sept. Therefore the existing surface level of River Yamuna after the rainy season is over is the same as Surface Geological plan. However detailed surface level surveys carried out to know the quantity of sand deposits. Applicant has assigned the work of assessment of replenishment/ sand deposition in the area to M/s JBB Technocrat PVT.LTD. Faridabad. who carried out the surveys for the assessment of sand deposits. The replenishment study comprises of Post Monsoon survey and Pre-monsoon survey will be carried out during the next year after 15th of June 2024 and again post monsoon survey after 15th of Sept 2024 and only then could arrive at volume calculation of sand replenished.

- **Period of Replenishment Study (2023)**

- The At the time of issue of LOI : 25 to 27 Oct.-2023

- **Need for present Annual Replenishment Study**

- By large as per prevailing EC& CTE conditions the Project Proponent should carry out replenishment study annually to ascertain the quantity of material replenished.
- As directed Department of Mines & Geology Haryana.
- The project proponent will submit the replenishment study report to Regional Office, MoEF&CC every year. The proponent should carry out a comprehensive replenishment study considering data collected at same location and at same time for at least three years and same needs to be

submitted to Regional Office, MoEF&CC.

- To fulfill to objective of the replenishment study and to comply with the direction of Director Mines & Geology Haryana Project Proponent assigned the work to M/s JBB Technocrat with "Monitoring Committee" of following experts for this purpose:
 - S.N. Sharma : Mining Expert
 - DC Yadav : Sr. Geologist
 - Yogeshwar P Mishra : Environmental Expert cum Drone Survey expert
 - Arafat Khan : GIS cum Survey Expert

5. Software & Equipment Deployed

Equipment:

- DGPS
- Drone

Software:

- Drone Mapper (Software)
- DJI Mavic GPS & Glonass Based Software
- Arc Gis 10.8 (Software)
- AutoCAD 2011 (Software)

Project Proponent appointed M/S JBB Technocrat Private Limited, Faridabad (Haryana), an Environmental Consulting Company for undertaking the replenishment

study.

- Pre-monsoon survey and replenishment study
- Post-monsoon survey and replenishment study
- To prepare composite sections of pre and post monsoon survey findings
- To calculate the volume of sand replenished during study period.
- Finally to prepare "Replenishment Study Report"

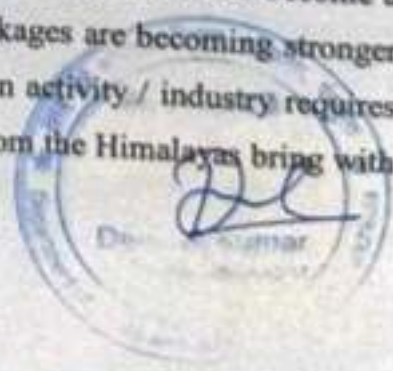
However as the Mine has not yet started, the actual mineral mined and replenishment of mineral after next coming rainy season is over will be assessed.

6. Replenishment Study

6.1 General Introduction:

Sediment is a naturally occurring material that is broken down by processes of weathering and erosion, and is subsequently transported by the action of wind, water, or ice or by the force of gravity acting on the particles. 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. But its over-exploitation and indiscriminate mining supersedes replenishment & optimum extraction is overtaken by profits, extraction has exceeded its replenishment rate and it neglects laws of mineral conservation.

Sand mining has become a widely spread activity and does not require a huge set up or technology, the number of ventures has increased extensively and it has become a footloose industry in itself but the backward-forward linkages are becoming stronger as many are getting employed as well as the construction activity / industry requires this mineral at consistent rates. 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.

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 km). This encompasses 40.2 % of the whole Ganga valley, prior to joining Ganga at Triveni Sangam in Allahabad (UP)

Itinerary of Yamuna River:

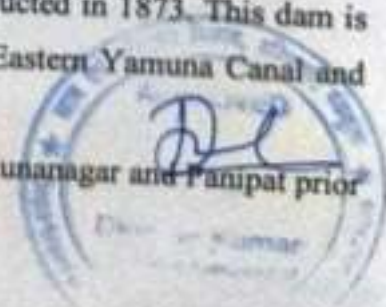
The river passes through many states such as Uttrakhand, UP, Haryana, going across to HP and then Delhi. With yearly discharge of around 10,000 cubic billion meters (cbm) and consumption of 4400 cbm (of which irrigation comprises 96%), the river represents above 70% of water provision of Delhi. Yamuna 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 2320 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 DakPatharclose 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 Uttarakhand & 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.

Drainage system is the pattern formed by streams, rivers and lakes in a drainage basin. In a drainage system, streams or rivers always connect together to form networks. Many factors such as topography, soil type, bedrock type, climate & vegetation cover influence input, output and transport of sediment and water in drainage basin (Charlton, 2008). These factors also influence the nature of the pattern of water bodies (Twidale, 2004). As a consequence, drainage pattern can reflect geographical characteristics of a river network to a certain extent. There are several types of drainage pattern. So far, much research has been done on the description of drainage patterns in geology and hydrology (e.g. Howard, 1967; Lambert, 1998; Twidale, 2004; Pidwirny, 2006).

In addition, sediment transport knowledge is important in river restoration, ecosystem protection, navigation, watershed studies and reservoir management. Bed load represents the lower portion of sediment load in natural rivers. Fluvial sediment load materials are transported by rivers. Sediment load can be divided into bed load and suspended load based on the mode of transport. Bed load is transported close to the bed where particles moved by rolling, sliding, or dissolving (Adegbola, 2012). Xiaoping (2003) explained that bed load transport in natural rivers is a complicated event. Its movement is quite uneven in both the transverse & longitudinal directions, which vary considerably.

6.2 Physiography:

The area forms a part of the Indo-Gangetic plains and exhibit flat terrain with general slope from north to south. The area is devoid of any prominent topographic features. However, a natural slope of topography in the District Palwal along the Great River Yamuna. Topographically the Yamuna Belt area and its flood plains (Active flood plains along the present day course of the river Yamuna) in eastern part of the district.

These are generally bordering the active flood plains and are wider, low lying flat tracts.

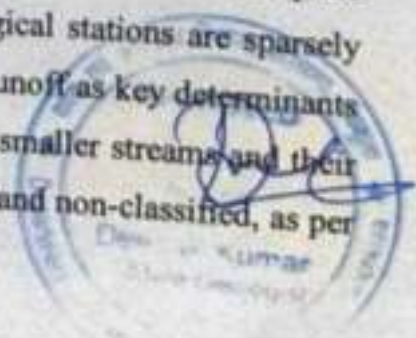
6.3 Drainage:

The Yamuna which marks the eastern boundary of the Haryana State provides the major drainage in the area. The River Yamuna emerges from Yamnotri off the Bansur-Punch glacier in Tehri-Garhwal district of Uttarakhand at an elevation of 6330 meters. It emerges into the plains from the foothills at Kalesar just north of Tajewala. The area constitutes alluvial plain without any conspicuous topographical features and forms a part of the vast Indo-Gangetic plain. The general slope of the area is southwards.

The Yamuna Rivers are plays an important role for the nation and provide water required by various sectors such as irrigation, drinking, recreation and industrial requirements etc. Besides, mining activities are also being carried out in the rivers for the developmental process. Di-siltation (remove of excess sand and stone from river bed) of the river helps to maintain the carrying capacity and provides protection from flooding during monsoon season. Further, continuous flow of river is essential for ecological and economic needs such as irrigation and biodiversity etc. Drainage study of the river helps to understand potential carrying capacity of water during pre-monsoon & post monsoon season which is generated from rainfall in the watershed and quantity of di-siltation of rivers under mining affected areas. Drainage and replenishment study was carried out in Yamuna River, Haryana was found with ephemeral streams. Quantification and estimation of river bed material (RBM) was accomplished by followed three scientific approaches i. e. mapping of watersheds by using Arc GIS software & and ERDAS software using analysis, survey of proposed mining area and grain size distribution of sand and gravel.

6.4 Sedimentation. Assessment and Infrastructure

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



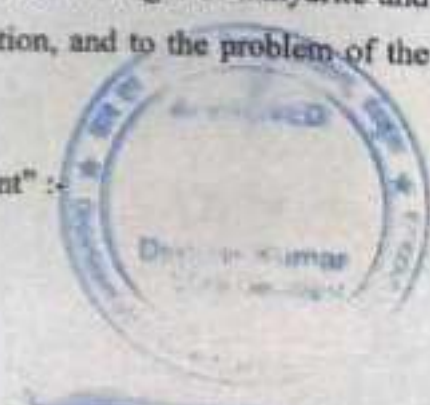
the latest hydrological data for unclassified River basins; there are 122 GDSW (Gauge, Discharge, Sediment & Water Quality) sites in 12 such basins, the number was 147 in 2005. This brings in context the whole issue of scientific mining, thereby indicating that the monitoring of sediment yield in rivers / 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'. **sedimentation**, in the geological sciences, 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 sedimentology.

Sedimentation is generally considered by geologists in terms of the textures, structures, and fossil content of the deposits laid down in different geographic and geomorphic environments. Great efforts have been made to differentiate between continental, near-shore, marine, and other deposits in the geologic record. The classification of environments and criteria for their recognition is still a subject of lively debate. The analysis and interpretation of ancient deposits has been advanced by the study of modern sedimentation.

Chemical sedimentation is understood in terms of chemical principles and laws. Although the famous physical chemist J.H. van't Hoff applied the principles of phase equilibrium to the problem of crystallizing brines and the origin of salt deposits as early as 1905, little effort was made to apply physical chemistry to the problems of chemical sedimentation. More recently, however, there has been investigation of the role of the redox (mutual reduction and oxidation) potential and pH (acidity-alkalinity) in the precipitation of many chemical sediments, and a renewed effort has been made to apply known thermodynamic principles to the origin of anhydrite and gypsum deposits, to the chemistry of dolomite formation, and to the problem of the ironstones and related sediments.

The factors which affects the "Computation of Sediment" :-



- Geomorphology & Drainage Pattern : The following geomorphic units plays important role :
 - Structural Plain
 - Structural Hill
 - Structural Ridge
 - Denudation Ridge & Valley
 - Plain & Plateau of Gangetic plain
 - Highly Dissected pediment
 - Un dissected pediment
- Distribution of Basin Area River wise (Area in Sq. Km or Sq. Miles)
- Drainage System/Pattern of the area (Drainage Density = Km/Sq. Km of Yamuna River)
- Rainfall & Climate : Year wise Rainfall data for previous 10 years of Yamuna Basin/River
- As per Dandy & Bolton study "Sediment Yield" can be related to i) Catchment Area and ii) Mean Annual Run-off

7. Approach & Methodology Followed for Replenishment Study of Chandhut(South) Sand Unit (Minor Mineral Sand Mine):-

- a) To draw post-monsoon contour map (Base map considered as per mining plan under consideration)
- b) Post-monsoon survey of River bed with the help of GPS and Drone.



- c) Same Grid pattern (30 m x 20 m) or part thereof was considered for survey.
- d) To draw post-monsoon contour map (Base map considered as per approved mining plan)
- e) To draw composite sections of Pre and post monsoon maps. This will determine the depth and volume of sand replenished.
- f) Finally to calculate the volume of sand with grid pattern of 30 m x 20 m multiplied by depth of replenishment.
- i) The tonnage of replenishment will be volume of sand multiplied by density of sand (which is 2 T per Cubic m).It will be completed after the next rainy season is over.



- **Contour Map at the time of issuance of LOI (Grid Pattern : 20m x 20m or Part Thereof)**

Enclosed at the end of report.



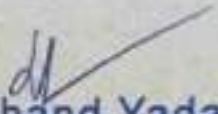
- **Tonnage calculation of Sand Replenished.**

ONLY post Moonsoon Grid, grid area and elevatioos are given in the calculation sheet.

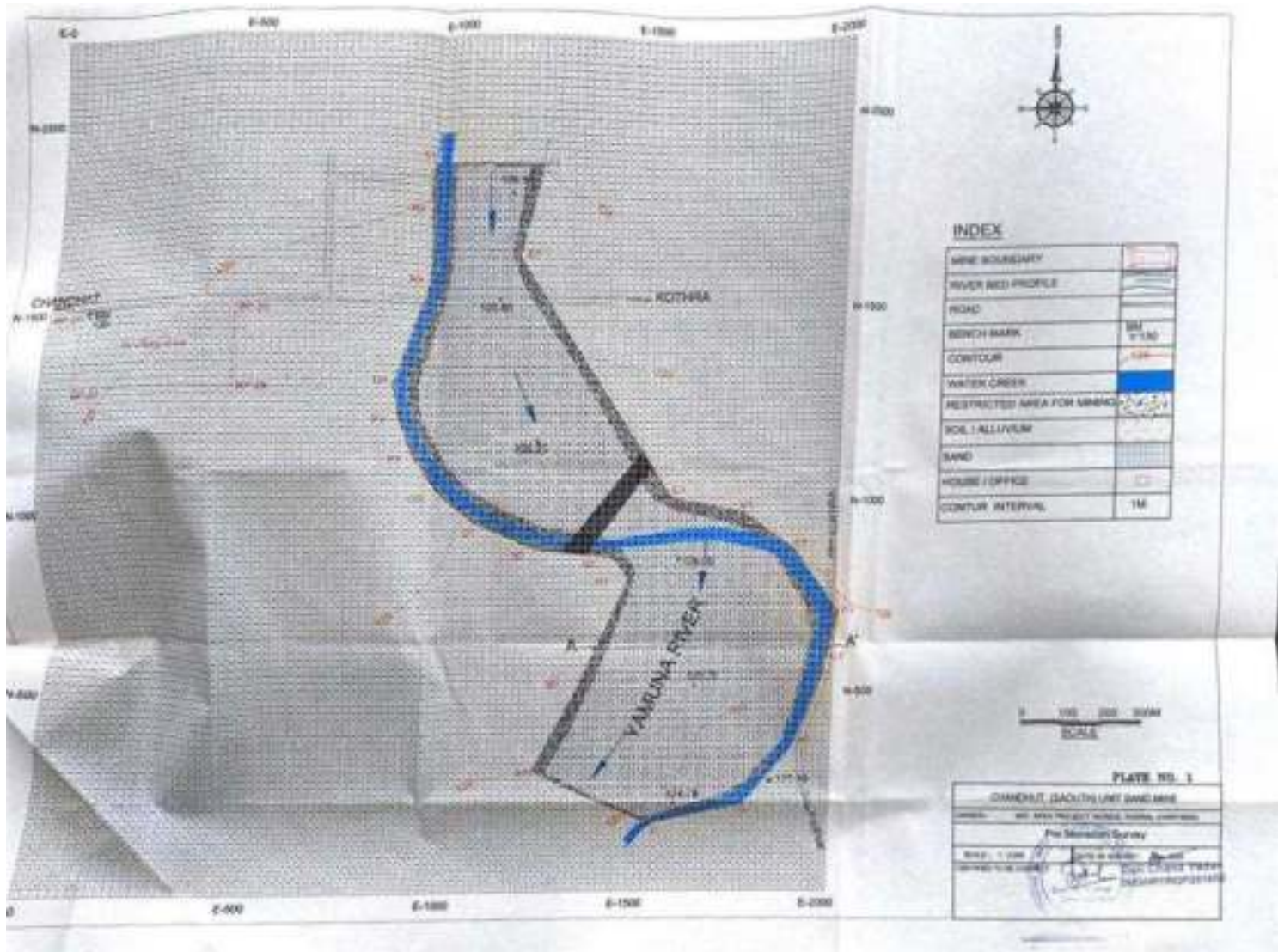
Grid	Grid Area	Pre Monsoon Elevation	Post Monsoon Elevation	Difference of Elevation (Pre And Post Monsoon) in m	Tonnage
Enclosed	Enclosed	NA	<i>Recorded on Map as shown in plate no. replenishment map/ Oct.2023.</i>	<i>Cannot be assessed now</i>	<i>Will be submitted after the next rainy season is over</i>

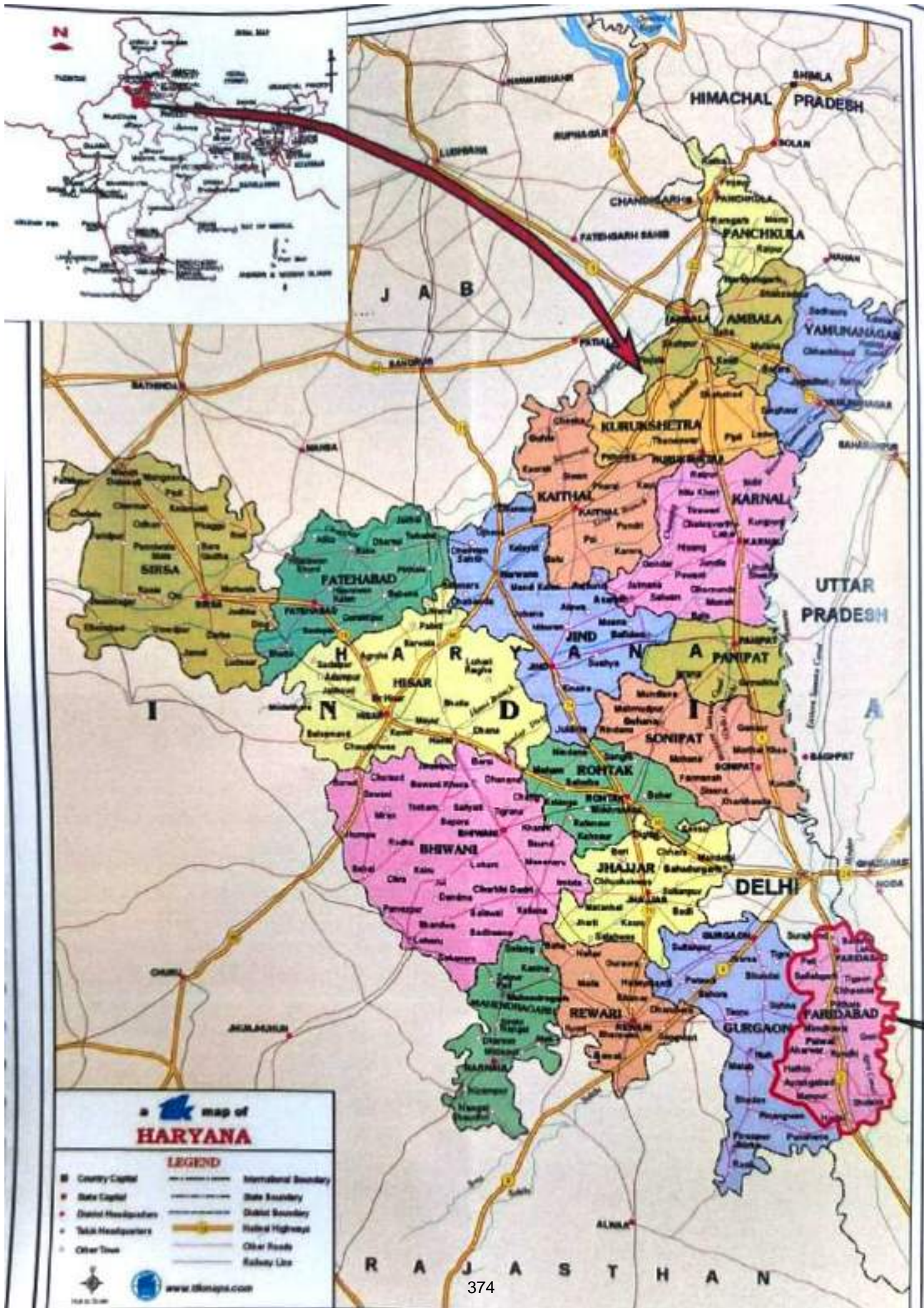
Conclusion

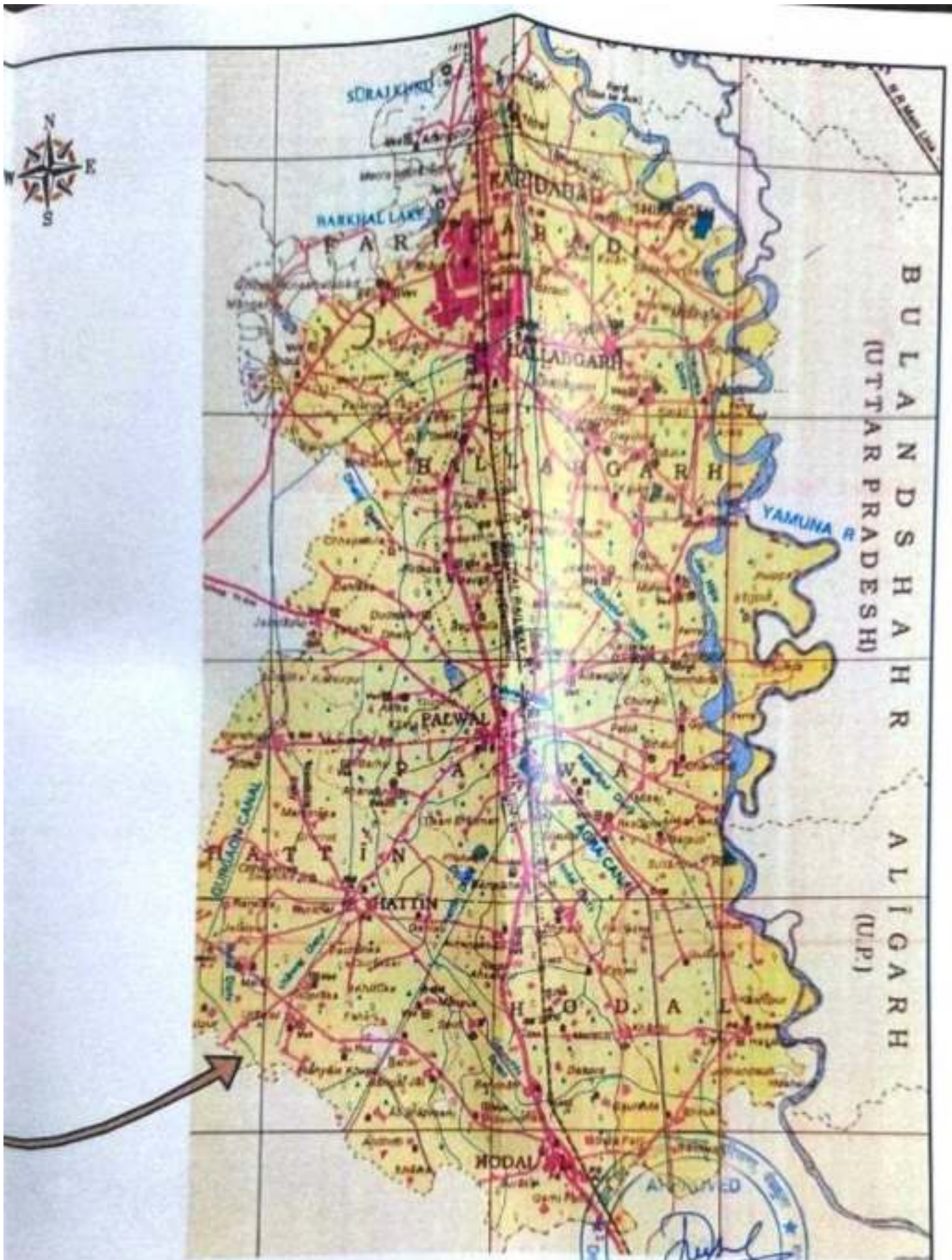
Present study is only the surface level measurements only after deposition/replenishment of the old worked mines if any. As The LOI was issued on 05-10-2023. No pre-monsoon study could be conducted as River Yamuna was full of water during the month of July, August and part of Sept 2023. It will be conducted during the coming years and final result of the study report will come out after the next rainy season is over.


Duli Chand Yadav
DMG/HRY/ROP/2018/03





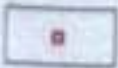




B U L L A N D S H A H R
(U T T A R P R A D E S H)

A L L I G A R H
(U.P.)

INDEX

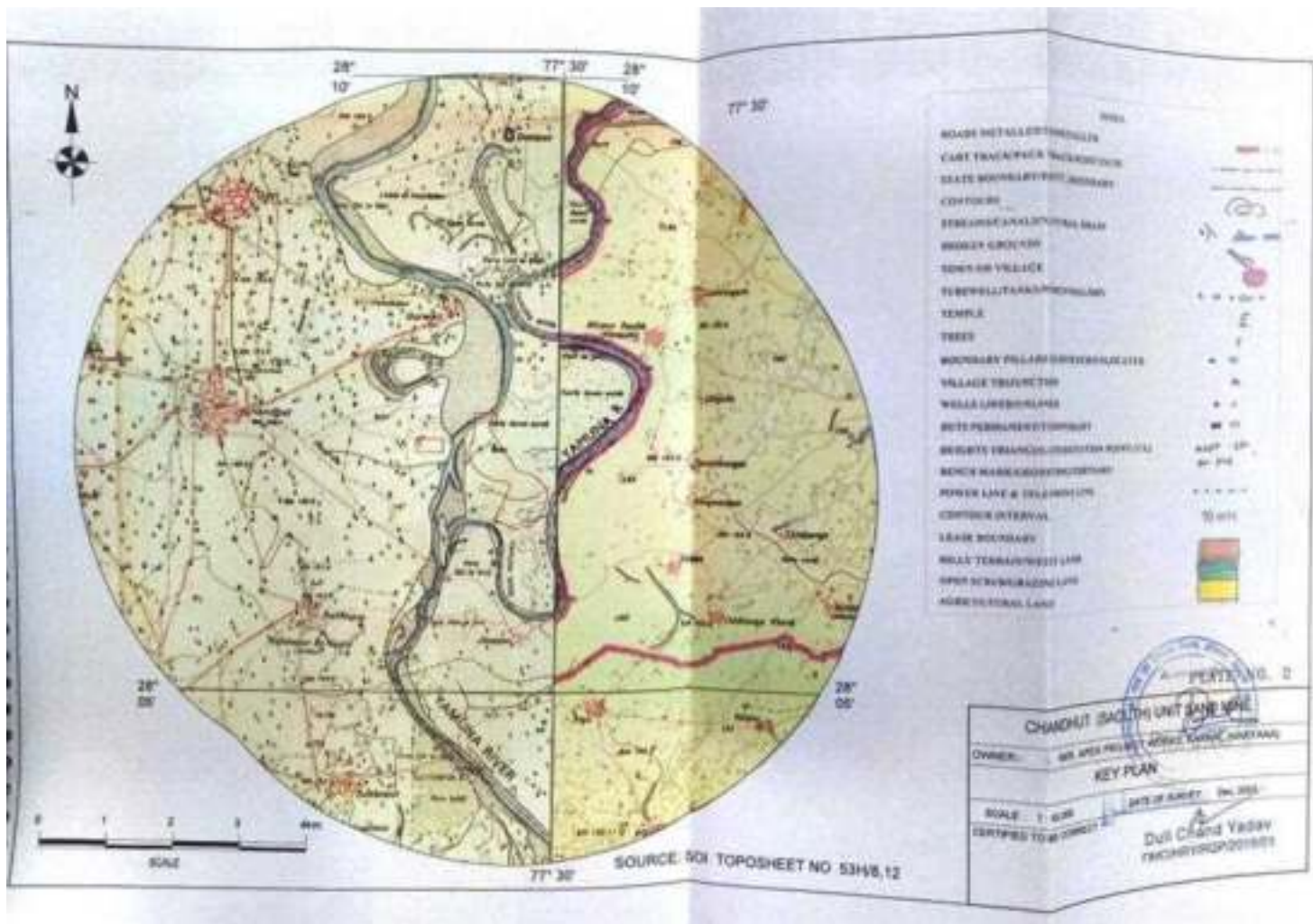


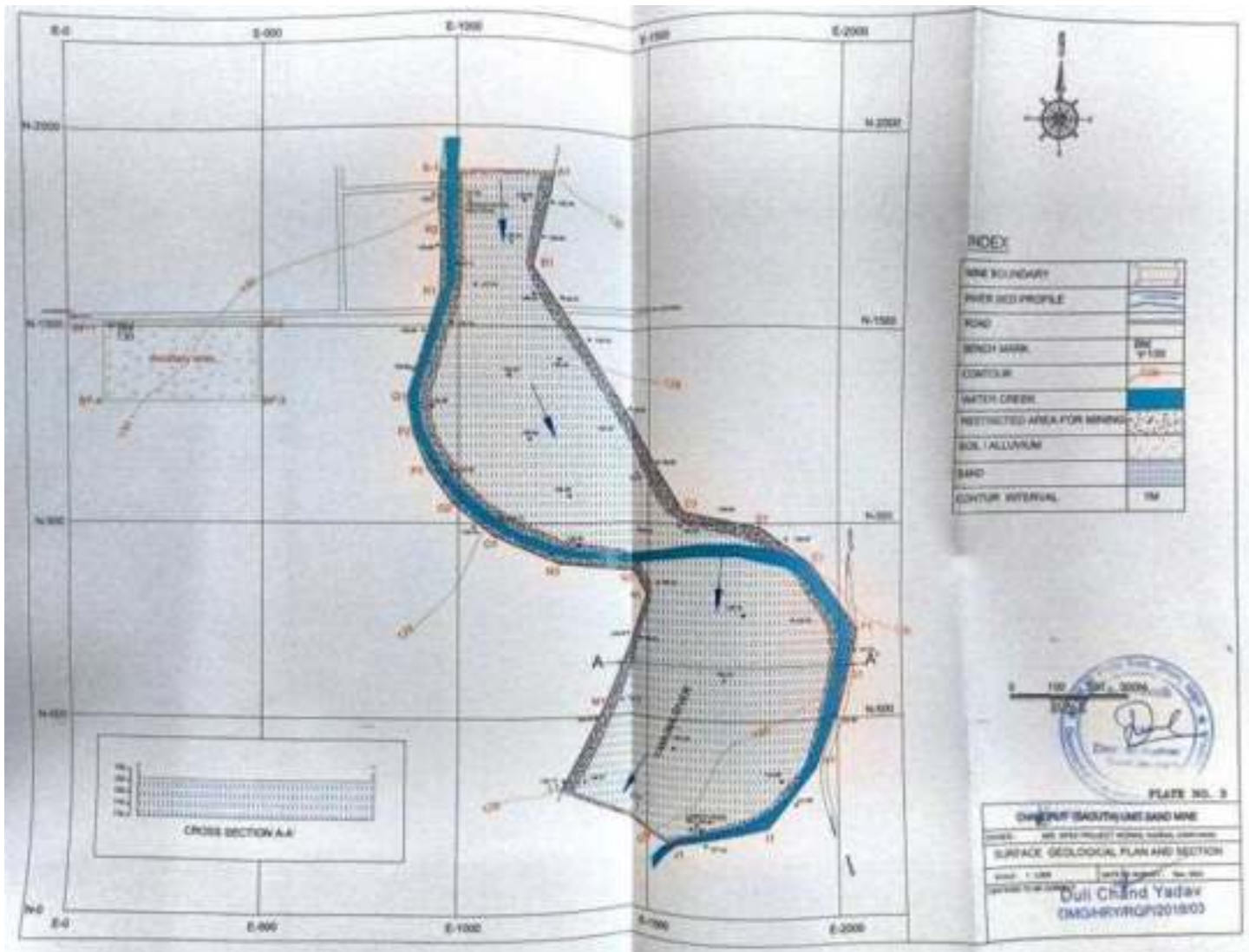
PROJECT SITE

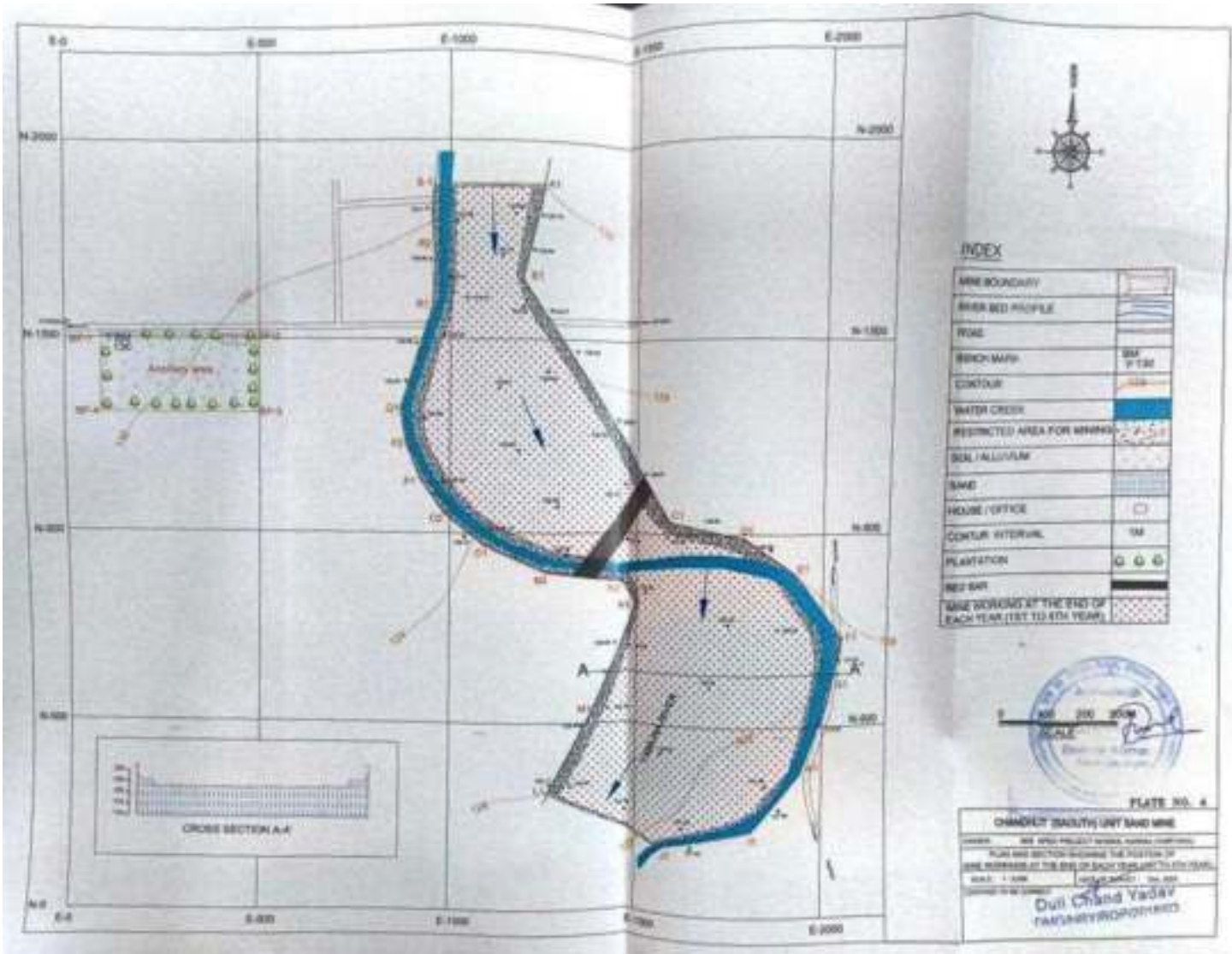
APPROVED
Date: 16/03/2018
Signature: Duni Chand Yadav

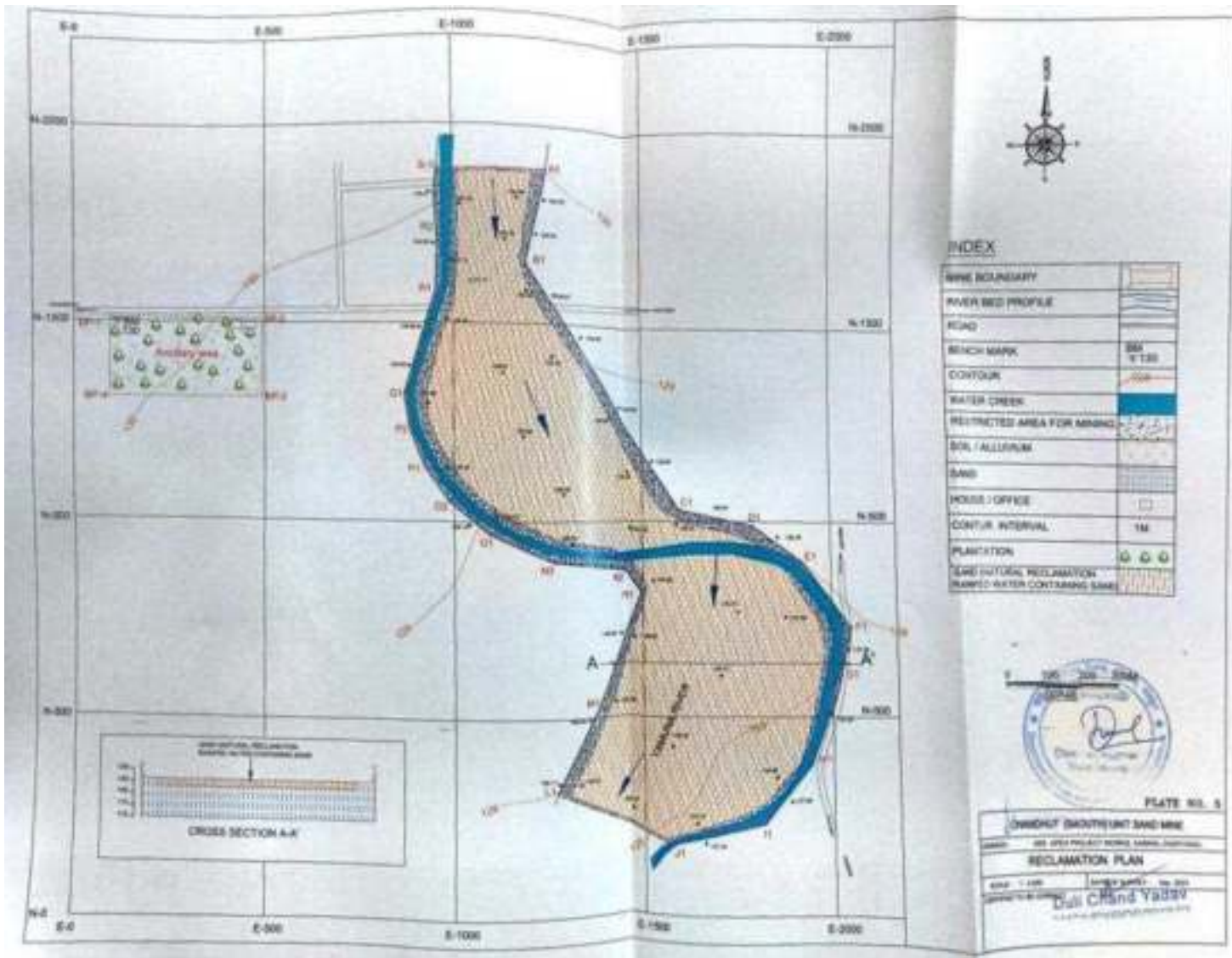
PLATE NO. 1

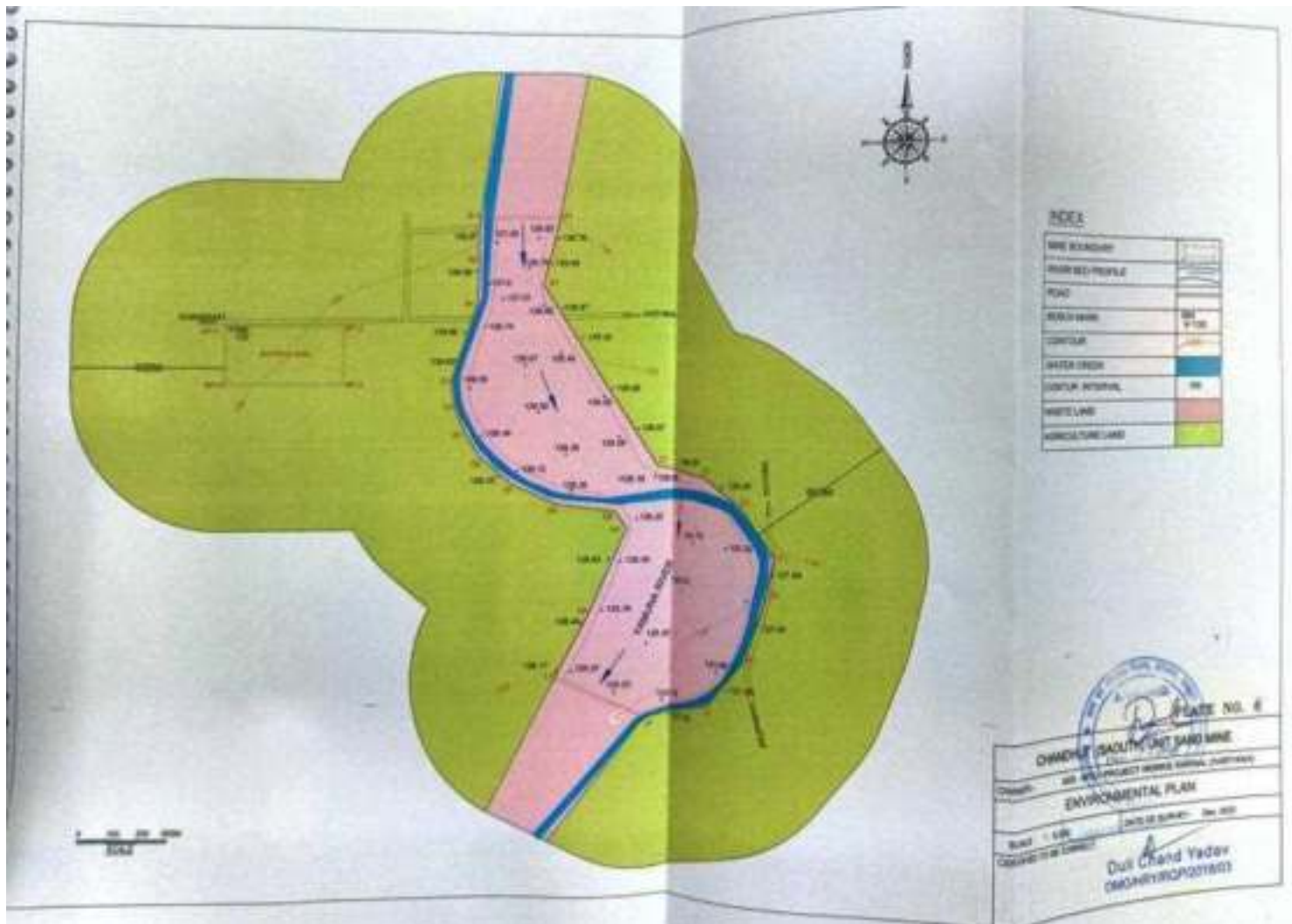
CHANDHUT (SAOUTH) UNIT SAND MINE	
OWNER: MS. HARYANA STATE SANDS CORPORATION (HSSC)	
LOCATION PLAN	
SCALE: NOT TO SCALE	DATE OF SURVEY: 16/03/2018
DRAWN BY: Duni Chand Yadav	
CERTIFIED TO BE CORRECT	
DMG/HRY/RQP/2018/03	











ANNEXURES – 1.4

**NOC FROM FOREST
DEPARTMENT**

OFFICE OF DY. CONSERVATOR OF FORESTS
PALWAL FOREST DIVISION, PALWAL.
 BHANGOORI RAJWAH, NEAR JAWAHAR NAGAR, CAMP, PALWAL-121102
 Tel : 01275-248978, E-Mail: dlopalwal@gmail.com

No. 3693
 In

Date 12/12/2023

Authorized Signatory,
 M/s Apex Project Works,
 Add. Shop No. 3 Mangrot Filling Station Near Yamuna Pul
 Village Mangrola Distt. Karnal 132001
 E-mail ID: apjindia@gmail.com

Subj: Clarification regarding applicability of forest laws on the land.
 Ref.: Your office letter dated 14.10.2023

Applicant Authorized Signatory, M/s Apex Project Works, Add. Shop No.3 Mangrot Filling Station Near Yamuna Pul Village Mangrola Distt. Karnal vide letter no NA dated 14.10.2023 made a request in connection with clarification regarding applicability of forest laws on non forest land for sand mining project at village Chandhul South - Ehasara No. 77//14,15 min,16 min,17, 24 min,25 min, 105//4 min,7 min,14min, 15 min,16 min,17,24,22 min,115//,1 min,10 min,11 min,12 min,18 min,20,21,22 min,118//,1,4,5,6,7,8,13,14,19,16,17,18,23,24,25,146//,1,4,5,6,7,8,9,11 min,12,13,14,15,16,17,18,19,20 min,21 min,22,23,24,25, 147//,1,2 min,3 min,8 min,9,10,11,12,13 min,17,18 min,19,20,21,22,23,24 min,151//,10min,11min,12 min, 13 min,18 min,19,20,21,22,23,24 min,152//,17,18,19,20,21 min,22 min,23,24,25,153//,1 min,2 min,3,4,5,6,7,8,9 min,12 min,13 min,14,15,16,17,18 min,24,25,183//,1,2,3,4min,5min,6min,7,8,9,10,11,12,13,14,15min,16min,17,18,19,20,21,22,23,24,25,186//,1,2,3,4,5min,6min,7,8,9,10,11,12,13,14,15min,16min,17,18,19,20,21,22,23,24,25,187//,1min,2,3,4,5,6,7,8,9min,12min,13,14,15,16,17,18,19min,21min,22min,23,24,25,215//,1 min,2,3,4,5 min,6 min,7 min,8,9,10,11,12,13,14 min,17 min,18,19,20,21min,22min,23,24,25, 118//1,2,3,4,5,6,7,8,9,10,11,12,13,14,15 in Continuation of report submitted by RFD, Palwal. Vide letter No. 1171 dated 21.11.2023, it is made clear that


As per records available above said land is not part of notified Reserved Forest, Strip Protected Forest land or any area closed under Section 4 & 5 of Punjab Land Preservation Act, 1900

As per records available as explained in para (a) to (c) of files of forest department is applicable on the said land

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.

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.

It shall be the responsibility of user agency/ applicant to get necessary clearances/ permissions under various Act and Rules applicable if any, from the respective authorities/department.


 Dy. Conservator of Forests
 Palwal

ANNEXURES – 1.5

APPROVED DISTRICT

SURVEY REPORT

From

Deputy Commissioner
Palwal

To

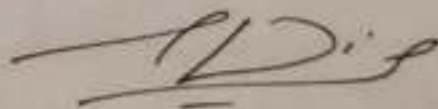
The Chairman
State Environment Impact Assessment Authority(SEIAA)
Bays no. 55 – 58 Paryatan Bhawan,
1st Floor Sector- 2, Panchkula, Haryana

No. 10814

Dated :- 31/10/23

Subject:- Regarding correction in the district survey report (DSR) of Palwal District, Haryana.

Apropos the above noted subject, it has been reported by Mining Officer, Palwal / Faridabad vide letter No. MO/FBD/3266 dated 16.10.2023 that District Survey Report of Palwal district was approved on dated 13.02.2023 but in that some clerical mistake were found (copy of letter enclosed). The report of Mining Officer with necessary corrections in the DSR with a request to consider the corrections and accept them as an integral part of the District Survey Report (DSR) of district Palwal, is hereby sent for your kind information and necessary action please.



Deputy Commissioner,
Palwal.

Department of Mines & Geology, Faridabad



To be substitute
Some No. & date

Memo No. :- MO/FBD/ 3266

Dated :- 16/10/2023

From,

Mining Officer
Deptt. of Mines & Geology
Faridabad / Palwal

To,

The Deputy Commissioner,
Palwal

Subject: Regarding correction in the district survey report (DSR) of Palwal District, Haryana

Ref: Your letter no. 9245 dated 06.1.2023

On the subject noted above, it is intimated that District Survey Report was approved on dated 13.02.2023 but in that some clerical mistake were found by the competent authority i.e. SEIAA, following corrections has been done in the available DSR of district Palwal and the same are mentioned below for your reference:

(1) No. of villages as mentioned in the DSR has been corrected and the correct number of tehsil subtehsil, Towns and villages (Revenue Estates) are below. Total length in district of river Yamuna is 28 KM.

Tehsils	-	03
Sub Tehsils	-	02
Towns	-	03
Villages (Revenue Estates)	-	28

Correct name is district Palwal shows a geographical boundary with Mewat, Aligarh, Gurugram and Faridabad.

(1.2) In district Palwal Aravali Hills are in the south.

(3.1) As per rough estimate total river bed passing through district Palwal is about 28 KM.

(3.2) Highest bidder Unit -1- 27.56 cr. And unit 2 – 29.5 cr.

(3.11) In point no. 3.11 correct name is district Palwal.

(11.2) In point no. 11.2 correct name is district Palwal.

प्रथम तल, जिला उद्योग केंद्र, नजदीक खजाना अधिकारी कार्यालय, नीलम चौक, फरीदाबाद - 121001
1st Floor, DIC Building, Near Treasury Office, Neelam Chowk, Faridabad - 121001
E-Mail - mominingfbd@gmail.com, Office Telephone No. 0129-2425530.

(14 & 16) Based on the study conducted and the surveys done the mineable mineral potential (MT) 60 percent of total mineral potential has been corrected and the correct figures are 2,01,93,157 MT in place of 2,74,05,000 MT respectively which is mentioned in para no. 14 and 16.

Hence forth Methodology adopted for calculation of Mineral Potential is corrected as follows:-

Portion of the river or stream recommended for mineral concession	Length of area recommended for mineral concession (in Kilometer)	Average width of area recommended for mineral concession (in meters)	Area recommended for mineral concession (in square meter)	Mineable potential (in metric tonne) (60./ of total mineral potential)
28 KM	28KM	290 M.	8,120,000 sqm	2,01,93,157 MT

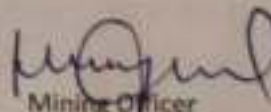
Mineral potential is corrected as follows:-

Sand (MT) min.	Total Mineable Mineral Potential (MT)
2,01,93,157	2,01,93,157
Annual Deposition	
3,27,12,914	3,27,12,914

Recommendation

From the above, it is clear that about 2,01,93,157 MT of mineral is available up to depth of three meters in the river bed of Yamuna River in Palwal District. The annual deposition is 3,27,12,914 MT. Hence 2,01,93,157 /- MT of mineral can be safely removed and disposed off every year.

Hence you are requested to kindly consider the above corrections and accept this letter as an integral part of the District Survey Report (DSR) of district Palwal, Haryana and same is forwarded to SEIAA for further necessary action.


 Mining Officer
 Deptt. of Mines & Geology
 Faridabad / Palwal

District Palwal

Palwal	Sr. No.	Name of village	Area earlier auction (in hectare)	Re-verified area (in hectare)	Area ancillary activity for like weighbridge, stocking etc
Sand Unit (I)	1	Maksudpur	28.00	10.00	Nil
	2	Hassapur	40.00	32.10	12.78
	3	Thanthari	43.34	47.00	14.30
	4	Rajupur Khaddar	34.80	69.94	8.75
	5	Dostpur	49.60	70.14	11.70
	6	Pehladpur	27.60	38.20	9.85
	7	Ghori	30.12	00.00	00.00
	8	Gurwari	60.90	55.40	17.57
Sand Unit (II)	9	Chandhut	88.40	60.99	19.15
	10	Rahimpur	07.50	00.00	00.00
	11	Sultanpur	Nil	18.00	09.83
	12	Atwa	Nil	17.10	10.00
	13	Kashipur	39.68	13.80	10.20
	14	Pataskonagar	85.90	00.00	00.00
	15	Hasanpur	Nil	39.54	20.00
Total			535.84	455.11	134.13

DISTRICT SURVEY REPORT

The main objective of the preparation of District Survey Report, as per "The Sustainable Sand Mining Guideline" is to identify the areas of aggradations or deposition where mining can be allowed; and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area.

1. Introduction

Minor Mineral Deposits:

- 1.1 Palwal district of Haryana is located in South-eastern part of Haryana State and lies between $28^{\circ}15'57.00''$ to $27^{\circ}51'34.0''$ North latitudes and $77^{\circ}07'12.9''$ to $77^{\circ}32'38.46''$ East longitudes. The total area is **1359 square kilometers**, in which there are 62 villages, 2 towns, 2 tehsils and 1 sub-tehsils. Large part of the district of Faridabad is situated between Aravalies in west and river Yamuna in east. Faridabad district is bounded by the state of Delhi in the north, by the state of Uttar Pradesh in the east, in west by Gurugram district and south by Palwal and Mewat Districts.
- 1.2 The district has a sub-tropical continental monsoon climate where we find seasonal rhythm, hot summer, cool winter, unreliable rainfall and great variation in temperature. In winters, frost sometimes occurs during December and January. The district also gets occasional winter rains from cyclones. The rain fall is mostly restricted to rainy season. The district has Aravali hills in the West and flood - plain along the Yamuna river in the east.
- 1.3 River Sand (Minor Minerals) finding use as construction material are found in the river bed areas and flood plain areas. The size and the concentration of material

gradually reduce towards down stream as the heavy material of larger size settles with reduction in flow of water stream. The material deposits are found in villages of the districts located along the river or their flood plains and abandoned water courses/drains.

Quartzite (Minor Minerals) is also found in hilly areas of Aravali within jurisdiction of district Palwal in West of the district sharing with District Mewat.

- 1.4 The water of river Yamuna is diverted partly towards Uttar Pradesh and Haryana for different Canal Systems for Irrigation purposes. In the main river bed area, the maximum water is only due to release of water from Kalindikunj Barrage during rainy seasons. The water released in the river during rainy season brings huge quantity of Sand which gets deposits in the river bed area.
- 1.5 Part area of river Yamuna in the State of Uttar Pradesh and part area falls in the State of Haryana. Though in general river Yamuna acts as natural boundary between the two state i.e eastern part in Haryana and western part in Uttar Pradesh. However at certain places, the entire area of river (both sides of river bank) falls in either of the State. In other words there are areas of river where entire riverbed area falls within the jurisdiction of Haryana or Uttar Pradesh.

Location Map of Mineral Bearing Areas:

- 1.6 The minor mineral deposits in the district Palwal can be divided mainly in two locations / blocks marked on a map of the area (Annexure "D"). The areas broadly can be divided in following Two categories for the purpose of location and type of areas :
- (i) Area in river Yamuna for excavation of Sand [Location A].
 - (ii) Area in Aravali hill range [Location B].

This report primarily relates to Location A as a litigation regarding location B is pending adjudication in Hon'ble Apex court.

Apart from above, Ordinary Clay/Ordinary Earth/Brick earth is also extensively available through the district.

2 Overview of Mining Activity in the District

Grant of Mineral Concessions for Mining of Minor Minerals.

2.1 Mode of grant of mineral concession

Before giving details of actual sites / number of sites or mineral concessions it would be appropriate to explain that the Mineral Concession in respect of minor minerals are granted as per provisions of the State Rules, framed by the respective State Governments in exercise of power under section 15 of the Mines and Minerals (D&R) Act, 1957.

2.1.1 The State of Haryana at the time of bifurcation in 1966, opted prevailing Rules namely "Punjab Minor Mineral Concession Rules 1964". These Rules were amended from time to time as per policy of the State Government for Minor Minerals. The Hon'ble Supreme Court vide its order dated 27.02.2012 directed all State Governments to revise their State Rules making provisions in accordance with various recommendations contained in the report of the 'Group' of MoE&F, GoI, on mining of minor minerals and the Model draft guidelines issued by the Ministry of Mines, GoI.

2.1.2 Accordingly, the State of Haryana comprehensively revised its State Rules namely, the "Haryana Minor Mineral Concession, Stocking, Transportation of Minerals, and Prevention of Illegal Mining Rules, 2012", repealing the prevailing Rules namely "Punjab Minor Mineral Concession Rules 1964".

2.1.3 The mineral concessions in the Haryana are being granted in the form of "Mining Contract" or "Mining Lease" through online competitive bidding process. The Mining Contracts are granted for a minimum period of 07 years and maximum period of 10 years. Whereas the Mining Leases are granted for a minimum period of 10 years and maximum period of 20 years

2.1.4 In district Palwal mineral concessions for Yamuna River bed are/were granted in the form of Mining contracts. The areas selected for mining in river bed are allowed to excavate mineral in the central 3/4th of river bed that too up to a maximum depth of 03 meters from existing level of river bed. Further following conditions are also being imposed 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 meters measured 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;

2.1.5 The method of excavation for mineral as stated above takes place only up to a maximum depth of 03 meters in the Central 3/4th part of the river bed. The area left on both side of the river bank not only ensures the safety of banks (bank cutting due to water stream) but also ensures that in the central part of river, water stream

requirements
through

flows smoothly during rains and process of river meandering does not occur. mineral from river bed is remove up to maximum depth of 03-meter layer from general level of the bed of the River Yamuna. The mineral excavated is directly loaded in the vehicles/dumpers and the vehicles owners and drivers take away the mineral directly to the consumers. In certain cases, mineral concession holders stacks mineral on the river bank in case, are not able to sell the material on actual mining itself

2.1.6 Further, In case of excavation of Ordinary Clay/Ordinary Earth/Brick Earth, Short Term Permits are being issued to either the owner of the land or to a person/owner of Brick Kiln, having consent from the owner of the land. The Short-Term Permits are being issued under rule 6, 30 and 31 of the "Haryana Minor Mineral Concession, Stocking, Transportation of Minerals, and Prevention of Illegal Mining Rules, 2012".

2.A. Method of Mining in river bed areas (semi-mechanized/mechanized or manual)

2.A.1 The Hon'ble NGT with regards to river bed mining has specifically desired to examine the mode of mining - shall the same be semi mechanized /mechanized or manual.

2.A.2 There is no specific definition of Semi - Mechanized Mining. The term Semi - mechanized mining in general is used were method of working in general are undertaken mechanically, however, some operations are also undertaken manually. Therefore, the semi mechanized mining or mechanized mining, is the same method of working. Sometime mechanized mining with light machines are also referred as semi- mechanized mining. The term semi mechanized mining is being used in general parlance where in the very same mining area in part area as per requirement manual mining is also under taken along with mechanized mining of manual sand/river bed mining.

2.A.3 Whereas Manual mining operations are undertaken using conventional hand tools only like chisel, hammer and crowbar etc. and operations are only labour intensive. As per

requirement manual lifting of sand and directly loading the sand in tractor trolleys etc. through labours itself.

2.A.4 The **Mechanized** mining operations in respect of sand mining are undertaken with the help of excavator-cum-loaders. In this process sand is lifted/excavated from the river bed through excavator-cum-loaders and directly loaded in dumpers or other mode of transport. The vehicles carrying the mineral from mines to site of use/ site of construction or sale stocks outside lease hold areas (*an independent business than that of mining*).

2.A.5 In the current scenario, it is impractical to undertake manual mining because :

- (i) The labours are not easily available;
- (ii) Manual mining cannot be undertaken in systematic and scientific manner as compared to mechanical mining which can be undertaken systematic/scientific and controlled mining.
- (iii) In case of manual mining to achieve desired level of production more number of manpower would be required meaning thereby human interface within river bed area would increase and more ecological damage would be caused.

2.A.6 The method of mining even otherwise can not be uniform even for same area and all the methods have their own pros and cons, however, considering the current scenario wherever feasible mechanized (semi-mechanized or mechanized is same thing) mining should be preferred over manual method.

2.B Regulation relating to Mining

2.B.1 As per prevailing State Rules, the Mineral Concession holders are required to get a Mining Plan for the area prepared from a "Registered Qualified Persons". The mining plan includes the area specific details along with the Mine Closure Plan (Progressive & Final) taking into consideration the details of the geology and lithology of the area including the estimated mineral reserves of the area. Proposed method of mining/ development of mines, use of explosives and blasting operations, if any, stacking and disposal of minerals, mine-drainage pattern, handling of the overburden, location of weigh bridges, and mineral

(i)

processing, if any. The extent of manual mining or mining with the use of machinery and mechanical devices along Level of Production (production from year-to-year for a period of five years), Mechanization, Type of Machinery to be used, nature and extent of the mineral body/ spot or spots where the mining operations are proposed to be undertaken; natural water courses, limits of mineral reserves and other forest areas and density of trees, if any, assessment of impact of mining activity on land surface and environment including air and water pollution i.e. the environment management plan. In addition to this Mining plan also suggests the details of scheme of restoration/ rehabilitation of the area through land reclamation, use of pollution control devices and such other measures as may be directed by the State Government from time to time.

2.B.2 The Mining Plan are to be got approved from the authorized officer of the State Government. Based on mining plan prior environmental clearance from the competent authority as per provisions of EIA Notification dated 14.09.2006 of MoEF, CC, Gol.

2.B.3 After obtaining the Environmental Clearances as Further, to comply with requirement of Air Act, 1981, the consent to establish and "consent to operate" from State Pollution Control Board are also obtained before actual mining

2.B.4 The above said provisions mainly relates to mineral conservation and environmental protection. With regards to provisions related to safety in mines and welfare of labors provisions under the Mines Act, 1952 are ensured by the Directorate General Mines Safety a department under the Ministry of Labour, Government of India.

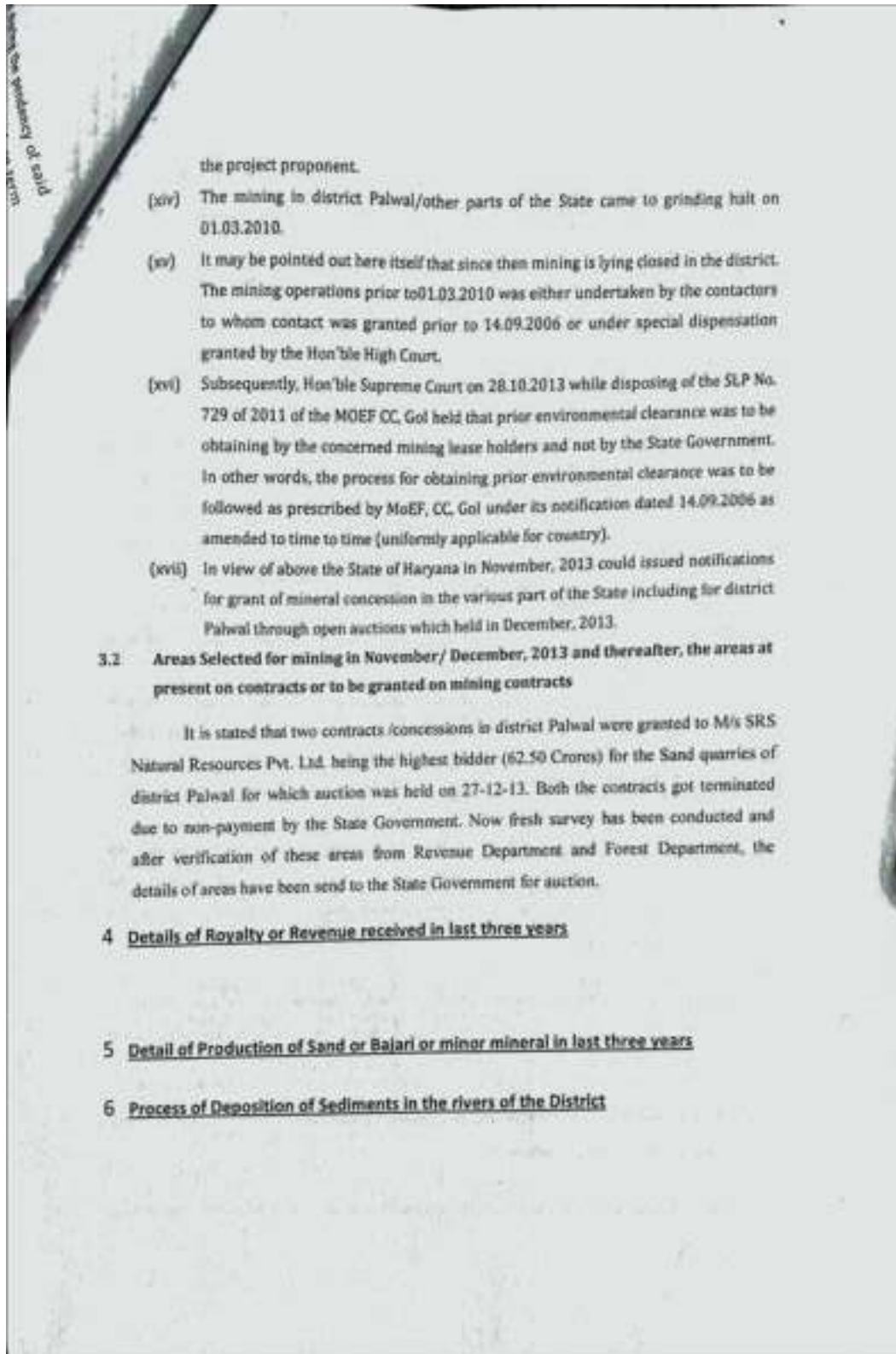
3 The List of Mining Leases in the District with location, area and period of validity

Areas selected for Mining in District Palwal

3.1 As per rough estimate total area of rivers beds passing through district Palwal is about 9 sq. km. As regards selection of area for mining it may be pointed out that:

- (i) Earlier, (about 16-18 years back) mineral concession/mining contracts were being granted for extraction of sand from river Yamuna of district Palwal on revenue estate basis, subject to various restrictions. The mineral concession holders used to undertake mining in areas after leaving restricted area.
- (ii) Initially about 28 villages (Includes 12 villages of present district Palwal) during joint Faridabad were being offered for mining, as area of some of the villages came under other restrictions either because of construction of some bridges on river bed or due to other development projects including habitation.
- (iii) The mode of grant of mining contracts of individual quarries/revenue estates in Palwal district was changed in late nineties and instead granting individual quarries on contract, number of adjoining quarries were clubbed for the purpose of granting mineral concession. On 18.04.2000, three zones namely Agwanpur- Basantpur Zone, Chandpur Zone and Murtzabad Zone were auctioned for three years. This mode was further changed and all minor mineral quarries of the district were given "as one unit". In this way their used to be a single contractor for all minor mineral quarries of a "district as one unit" from 03.06.2003 for a period up to 28.02.2010.
- (iv) *Needless to state that such mineral concession areas use to have even the areas having no mineral deposits the areas otherwise not permissible for mining. The mineral concession holders were under obligation to undertake mining only in the areas free from all restriction and as per prevailing all Rules and Regulations. Mineral Concessions for minor Mineral prior to 14.09.2006 were not required to obtain Environmental Clearance.*
- (v) The EIA notification dated 14.09.2006 became applicable for fresh contacts/ leases and in the year 2008 for grant of mineral concessions in respect of other areas in the State fresh auction was notified subject to condition that mining will be allowed to be undertaken only after prior environmental clearance is obtained as per requirement of EIA notification dated 14.09.2006 of MoEF,CC, Gol. However, said condition was challenged by some prospective bidders on the plea that the notification dated 14.09.2006 was not applicable for mining of minor minerals.
- (vi) The operation of notification dated 14.09.2006 for mining of minor mineral was stayed by the Hon'ble Punjab and Haryana High Court vide its interim order dated 07.04.2008 in CWP No. 4578 of 2008- Chandi Mandir Stone Crusher Consumer Company Vs. Union of India and Others.

- (vii) The State could not have granted long term contracts during the pendency of the case because operation of the notification was under stay and in case long term contracts were granted the mineral concession holders would have claimed that at the time of grant the notification was not applicable for them or may have sought to cancel the contract.
- (viii) Subsequently, the Hon'ble High Court on 15.05.2009 while disposing of the above said writ petition (along with CWP no 20134 of 2004 Vijay Bansal V/s State) upheld that notification dated 14.09.2006 was applicable for mining of minor mineral also.
- (ix) However, as regards the process of obtaining the prior environmental clearance, the Hon'ble High Court directed the process to be followed in two parts. In the first stage, it was directed that the state of Haryana would submit the ToRs to the EAC and the EIA report will be prepared by Expert Appraisal Committee (EAC) in the MoEF, Gol before conducting the auctions. Subsequent to the holding of the auctions, the successful bidder shall obtain the prior environmental clearance from the competent authority.
- (x) The Hon'ble High Court, considering that some time would be required for completing the process as per above, and general public would face problems due to sudden closure of mining, permitted mining without environmental clearance for the period up to 28.02.2010.
- (xi) Accordingly, no long-term contract in Faridabad area could be granted due to above litigation and after expiry of the last contract the mining operations was allowed in district Faridabad (as well as in other part of the state) for the period of up to 28.02.2010 without environmental clearance as per orders of Hon'ble High Court.
- (xii) However, the order dated 15.05.2009 of Hon'ble High Court relating to preparation of EIA report by the State Government was not acceptable to the MoEF, CC, Gol. The MoEF was of the view that state being regulating agency can not prepare the said report at its own. Therefore, the applications submitted by State of Haryana for approval of ToR were not considered.
- (xiii) The MoEF initially filed a Review Application before the Hon'ble High Court and thereafter SLP before the Hon'ble Supreme Court. During the pendency of said matter the state of Haryana neither could take further action relating to preparation of EIA report nor could auctioned its minor mineral areas for grant of mineral concessions subject to condition that Environmental Clearance shall be obtained by



Description of formations

Description of formations found in the area is as under:

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

6.1 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.

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.

6.2 Origin and control of mineralization (annual replenishment of mineral in river bed area vis-a-vis sedimentation)

Yamuna basin is bordered by river Yamuna from Yamunanagar to Delhi and National Highway

No. 1 from Nilokheri to Delhi. Between Nilokheri and Delhi the National Highway No. 1 is aligned on the levee of River Yamuna and acts as water divide between the ancient River Saraswati and Yamuna. The Riverine action deposited several meter thick sand layers in the riverbed. Slow shifting of river Yamuna towards east left behind several meter deep sand deposits, which was subsequently covered by alluvium consisting sand, silt and clay to form topsoil. The Yamuna basin measuring around 1700 sq km is estimated to have 300 billion cu m of sand deposits in the basin.

River sediment is transported based on the strength of the flow that carries it and its own size, volume, density, and shape. Stronger flows will increase the lift and drag on the particle, causing it to rise, while larger or denser particles will be more likely to fall through the flow. Rivers and streams carry sediment in their flows. This sediment can be in a variety of locations within the flow, depending on the balance between the upwards velocity on the particle (drag and lift forces), and the settling velocity of the particle

If the upwards velocity is approximately equal to the settling velocity, sediment will be transported downstream entirely as suspended load. If the upwards velocity is much less than the settling velocity, but still high enough for the sediment to move (see Initiation of motion), it will move along the bed as bed load by rolling, sliding, and saltating (jumping up into the flow, being transported a short distance then settling again). If the upwards velocity is higher than the settling velocity, the sediment will be transported high in the flow as wash load.

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 sedimentology. Sedimentation is generally considered by geologists in terms of the textures, structures, and fossil content of the deposits lay down in different geographic and geomorphic environments. The factors which affects the "Computation of Sediment":

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 10 years of Yamuna Basin/River

e) As per Dandy & Bolton study "Sediment Yield" can be related to

- i) Catchment Area and
- ii) Mean Annual Run-off

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

Sand mining has become a widely spread activity and does not require a huge set up or technology, the number of ventures has increased extensively and it has become a footloose industry in itself but the backward-forward linkages are becoming stronger as many are getting employed as well as the construction activity / industry requires this mineral at consistent rates. In the state of Punjab, sand has been declared as an essential commodity so as to control its extraction and sale price. Andhra Pradesh on the hand is heading towards a lottery system. Riverine environmental systems are unique in them selves and provide environmental services, natural resources to meet variety of needs of urban and rural communities. 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 pathar barrage leaves Uttarakhnad 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 Triveni Sangam in Allahabad (UP) Itinerary of Yamuna River.

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 Ultrakashi 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 2320 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 Oak Pathar 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 Mamdubas village near Hatnikund in the YAMUNANAGAR district of Haryana where a Barrage is being constructed. This Barrage/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 Kamal, 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 Doad 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 & Ultrakhand	74208/28662 (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)

The closest mountain system in all these places is the Shivaliks i.e. Outer Himalayan region where the sub-mountainous regions begin and eventually expand into plains. As the river flows further down, the reach of its active floodplains increase.

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. 'WE' 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 basin 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 increased from 0 to 2 inches. Thereafter, for mean annual runoff from 2 to 50 inches, annual sediment yield per unit area decreased exponentially. This led to the following equations.

For $Q \leq 2$ in.:

For $Q > 2$ in.:

In which $OR =$ reference mean annual runoff $OR = 2$ in.

Dandy and Bolton combined above equations into a set of equations to express sediment yield in terms of drainage area and mean annual runoff (Q).

For $Q < 2$ in.:

For $Q > 2$ in.:

Sediment Productions/yield.

For $S = 1645$ tons/mi²/y, $Q = 2$ in., and $A = 1$ mi², reduces to the followings:

For $Q < 2$ in.: $S = 1280 Q^{0.46} (1.43 - 0.26 \log A)$

For $Q > 2$ in.: $S = 1965e^{-0.055Q} (1.43 - 0.26 \log A)$

Above equations 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 regional assessment of sediment yield for watershed planning purposes.

Calculation of Sediment Yield for Sand Mines of Palwal-

- Area under riverbed: 9 square KM

- Drainage basin area of river Yamuna in Haryana : 21265 square kilometers
 - Average Annual Runoff from Yamuna Nagar to Palwal district: 140.50 mm
(the data used for runoff calculation is of the year 2004-2008 of district Yamunanagar, Karnal, Panipat, Sonapat, Faridabad and 25% is being taken as runoff)
- With above inputs, the calculation of the sediment yield by the Dandy and Bolton formula is illustrated below:

Formulas

For $Q < 2$:

$$S = 1280 Q^{0.44} [1.43 - 0.26 \log(A)]$$

For $Q \geq 2$:

$$S = 1965 e^{-0.004A} [1.43 - 0.26 \log(A)]$$

[Q (mm), A (km²), Y (tons/km²/yr)]

Reference

Ponce, V. M., 1989. Engineering Hydrology. Principles and Practices. Prentice Hall, pages 547-548.

With above formula the value of S = 209.39 T/ square KM /annum

Therefore the Total Sediment Yield per annum for drainage basin of 21265 square kilometers will be = 21265 x 209.39 = 44,52,678 T per annum.

Dandy & Bolton 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 basin comprises of sediment rocks with good average rainfall and high drainage density therefore there are fair chances of yield of sediments to be 50 fold of computed results hence Annual Sediment Yield will be : 44,52,678 T x 50 fold = 22,26,33,900 T / Annum. Even if calculated on lower side of 10 folds then also the Annual Sediment Yield will be 44,52,678x10= 4,45,26,780 T / 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 from 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 from individual drainage basins may vary 10-fold or even 100-fold from computed yields.

The sediments are river borne and are the product of sedimentary process. The entire river bed is having ample quantity of sediments. The size of the sediments depends upon the velocity of flow of water in the river.

River sediment are transported based on the strength of the flow that carries it and its own size, volume, density, and shape. Stronger flows will increase the lift and drag on the particle, causing it to rise, while larger or denser particles will be more likely to fall through the flow. Rivers and streams carry sediment in their flows. This sediment can be in a variety of locations within the flow, depending on the balance between the upwards velocity on the particle (drag and lift forces), and the settling velocity of the particle

If the upwards velocity is approximately equal to the settling velocity, sediment will be transported downstream entirely as suspended load. If the upwards velocity is much less than the settling velocity, but still high enough for the sediment to move (see Initiation of motion), it will move along the bed as bed load by rolling, sliding, and saltating (jumping up into the flow, being transported a short distance then settling again). If the upwards velocity is higher than the settling velocity, the sediment will be transported high in the flow as wash load.

7 General Profile of the District

As regards to the profile of the district is concerned on the western edge of the district there are varieties of formations of Delhi Super Group ranging from 200 at bottom and 315 at top. On the eastern edge of the district is river Yamuna

8 Land Utilization Pattern in the district:

Forest, Agriculture, Horticulture, Mining etc. In district Palwal, part area is under Agriculture and Horticulture, part area is for mining and few part of land is also forest.

9 Physiography of the District;

9.1 Physiography, Hydrogeology, Drainage and Climate

The area of is marked by flat topography of sedimentary formations, which are surrounded by fine-grained blown soil overlying the sand deposits. Highest elevation is 191.70 mRL & lowest 181.10 mRL in the proposed lease area.

The Yamuna river flows from N to S direction. The alluvial ground surface area over lying sand some distance away from the riverbed is under cultivation. It is believed that in the past, the River Yamuna used to flow closer to the present GT road which has now moved about 5-15 kms towards east.

9.2 Hydrogeology

Ground water occurs in alluvium and the underlying weathered/ fractured quartzite. 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. 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 of 5.5 to 7.00m. The transmissivity 'T' value ranges between 55 to 200 m²/day was determined. Shallow tube wells for irrigation use are generally constructed upto a depth of 40 m. The discharge of these shallow tubewells range 360 -600 litres per minutes. The depth to water level ranges from 2.00 m bgl to 10.75 m bgl during pre-monsoon period (Plate1), and m. bgl village. 2 to 9.40 m. bgl. during post monsoon period (Plate 2). The water level trend during pre-monsoon period indicates average fall of 0.20m/year. The long term water level trend is show small decline and other places rise in district.

10 Rainfall:

ENVIRONMENT STATISTICS (CLIMATE)
Monthly Normal Rainfall by Districts Average of 5 years (2004-2008)

No. 4.2

District	Monthly					(Millimetres)
	January	February	March	April	May	
1	2	3	4	5	6	
Ambala	28.00					
Panchkula	30.06	51.00	46.50	12.30	47.70	
Yamunanagar	28.36	48.40	56.40	3.80	24.80	
Kurukshetra	17.40	41.56	32.96	18.56	33.70	
Kaithal	7.48	24.90	21.10	4.80	24.90	
Karnal	16.80	19.48	23.12	5.64	29.26	
Paripat	13.80	34.90	18.50	6.10	29.80	
Sonapat	10.80	16.00	22.00	3.20	17.20	
Rohatak	3.40	17.60	19.60	4.70	38.90	
Jhajjar	3.44	12.80	18.70	6.40	27.20	
Fatehabad	4.64	17.48	21.24	6.80	38.92	
Gurgaon	1.72	15.64	19.96	8.06	30.04	
Mewat	0.0	24.58	24.32	2.04	34.52	
Rewari	2.64	18.32	7.20	1.00	21.24	
Mehendragarh	4.68	23.24	22.04	3.84	31.38	
Bhiwani	3.20	21.96	14.30	6.66	28.82	
Jind	10.74	18.08	18.72	6.44	35.24	
Hisar	6.78	32.66	27.94	5.06	43.34	
Fatehabad	7.50	15.90	15.68	6.18	22.22	
Sirsa	2.80	16.16	17.86	10.10	23.36	
		14.60	16.50	3.30	11.10	

ENVIRONMENT STATISTICS (CLIMATE)

Monthly Normal Rainfall by Districts Average of 5 years (2004-2008)

No. 42 (Contd.)

(Millimetres)

District	Monthly								Annual
	June	July	August	September	October	November	December	Total	
1	7	8	9	10	11	12	13	14	
Ambala	12.10	295.36	271.10	104.37	33.50	1.20	1.10	1004.08	
Rohtak	75.40	238.40	239.00	115.24	22.40	0.00	1.20	677.90	
Yamuna Nagar	159.30	234.30	171.90	81.40	10.70	1.20	4.30	619.20	
Karnal	94.00	93.50	70.70	40.70	0.00	0.00	1.10	355.50	
Rudra	38.74	96.10	104.00	87.90	2.94	0.00	0.00	483.28	
Haridwar	25.70	85.20	108.00	90.40	12.90	1.00	0.00	442.50	
Pheroze	10.00	108.00	118.00	22.40	0.20	1.40	0.30	483.30	
Dehra	17.10	128.70	140.00	37.30	21.40	0.00	0.20	383.72	
Dehra	90.40	90.40	110.00	30.40	10.00	2.00	2.40	460.70	
Jaipur	10.00	17.30	115.10	80.00	7.40	0.00	0.00	463.80	
Faridkot	40.00	127.10	130.70	30.00	25.00	0.40	0.00	497.20	
Chang	31.30	94.20	112.20	80.00	20.00	0.40	2.04	401.08	
Muz	47.00	51.00	31.00	14.30	0.00	0.00	0.00	193.44	
Meerut	7.20	112.30	100.00	30.20	2.00	0.00	0.30	304.80	
Mahendragarh	120.10	80.20	70.00	90.10	0.00	2.04	1.50	393.62	
Meerut	30.20	80.00	112.30	30.00	10.00	1.10	0.70	404.30	
Meer	30.70	120.00	112.00	80.30	12.40	2.00	1.20	590.08	
Meer	30.10	80.00	112.00	30.20	5.20	2.00	1.40	299.08	
Meer	30.20	80.40	112.00	30.00	1.20	0.04	1.40	335.76	
Meer	30.20	40.00	30.20	27.30	2.00	1.00	1.50	205.30	

Source: Director of Land Records, Haryana.

11 Geology and Mineral Wealth

III Regional Geology

The regional geology of Dist. Faridkot & Patiala (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 Heon (1928) in the Alwar & Ajabgarh series of Delhi system & intruded by basic granitic rocks.

The general succession of Delhi system can be represented as follows: (Dix, Gupta S.P. 1968)

Series	Rock Types
Recent intrusives	Alluvium, dune sand, soil, ankerite, chert, quartz veins, younger basic dykes, Granites, Pegmatites,

		Quartz veins Older basic rocks.
Ajithgarh 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. Staurolite, 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.

11.2 LOCAL GEOLOGY

River sand found in Distt. Faridabad & 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.

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

In district Faridabad there is only one source of river sand i.e. river Yamuna.

12. Drainage system with description of main rivers

S. No.	Name of the river	Area drained (Sq. Km)	% Area drained
1	Yamuna River (1376 km)	21265	6.5

13. Salient Feature of Important Rivers and Streams:

S. No.	Name of the River or Stream	Total Length in the District (in Km)	Place of origin	Altitude at Origin
1	River Yamuna	38.50	Yamnotri	3291 mts Or 10797 feet

14. Methodology adopted for calculation of Mineral Potential

Portion of the River or Stream Recommended for Mineral Concession	Length of area recommended for mineral concession (in kilometer)	Average width of area recommended for mineral concession (in meters)	Area recommended for mineral concession (in square meter)	Mineable mineral potential (in metric tonne) (60% of total mineral potential)
35 km	35	290 meters	1,01,50,000 Sqm	2,74,05,000 MT

15. Present Status of mining**16. Mineral Potential**

Sand (MT) min.	Total Mineable Mineral Potential (MT)
2,74,05,000	2,74,05,000
Annual Deposition	
4,45,26,780	4,45,26,780

Recommendation:

From the above, it is clear that about 2,74,05,000 MT of minerals is available up to depth of three meters in the river bed of Yamuna River in Faridabad District. The annual deposition is 4,45,26,780 MT. Hence, 2,74,05,000/- MT of mineral can be safely removed and disposed off every year.

Further, if any new area with mineral deposit is available in future, inadvertently left out or received under any scheme of the Government from neighboring state then the same will also be part of the mineral concession.

ANNEXURES – 1.6
TERMS OF
REFERENCE ISSUED
BY SEIAA, MP



File No.:
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Level Expert Appraisal
Committee(SEAC), HARYANA)



Dated 12/06/2024



To,

M/s APEX PROJECT WORKS
Shop No. 1, Manjeet Filling Station, Near Yamuna Pur, Manglora, Manglora, KARNAL, HARYANA,
Manjeet Filling Station, 132001
apexprojectswork@gmail.com

Subject: Standard Terms of Reference (ToR) to the proposed for Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 245.39 acres (98.156 ha) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Sir/Madam,

This is in reference to your application submitted to SEAC vide proposal number SIA/HR/MIN/473999/2024 dated 23/05/2024 for grant of Terms of Reference (ToR) to the project under the provision of the EIA Notification 2006-and as amended thereof.

2. The particulars of the proposal are as below :

(i) ToR Identification No.	TO24B0107HR5295893N
(ii) File No.	
(iii) Clearance Type	Fresh ToR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals Environment Clearance for Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 245.39 acres (98.156 ha) located at Village Chandhut South, Tehsil & District Palwal and State Haryana
(vii) Name of Project	
(viii) Name of Company/Organization	APEX PROJECT WORKS
(ix) Location of Project (District, State)	PALWAL, HARYANA
(x) Issuing Authority	SEAC
(xii) Applicability of General Conditions	YES

3. The **SEAC** has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after detailed examination hereby decided to grant Standard Terms of Reference to the instant proposal of **M/s.APEX PROJECT WORKS** under the provisions of the aforementioned Notification.
4. The brief about products and by products as submitted by the Project proponent in Form-1 (Part A, B) and Standard Terms of Reference are annexed to this letter as Annexure (1).
5. The Ministry reserves the right to stipulate additional TORs, if found necessary.
6. The Standard Terms of Reference (ToR) to the aforementioned project is under provisions of EIA Notification, 2006 and as amended thereof. It does not tantamount to approvals/consent/permissions etc required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.
7. The granted letter, all the documents submitted as a part of application viz. Form-1 Part A and Part B are available on PARIVESH portal which can be accessed by scanning the QR Code above.

Copy To

apexprojectwork@gmail.com
scy.seachr@gmail.com

Annexure 1

Standard Terms of Reference for conducting Environment Impact Assessment Study for Mining of minerals and information to be included in EIA/EMP report

1. Project Details

Sr. No.	Terms of Reference
1.1	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. The production details need to submit since inception of mine duly authenticated by Department of Mines & Geology, State Government.
1.2	A copy of the document in support of rightful lessee of the mine should be submitted. In case of new mines copy of LoI granted by State Government to be submitted. PP should ensure that LoI is valid at the time of grant of ToR. PP should submit the copy of lease deed/supplementary lease deed/extension letter/transfer deed, from its initial grant to subsequent renewals/ transfer/extension of validity.
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.
1.4	PP should submit the District Survey Report (DSR) as per S.O. 3611(E) dated 25.07.2018 in case of minor minerals.
1.5	Brief of proposal to be submitted which include total excavation of the material required for the

Sr. No.	Terms of Reference
	production of certain quantity of the minerals, location of the project, mining lease area, latitude longitude, seismic zone etc. In case of expansion project details of expansion viz. expansion in mining lease area or expansion in production of any particular mineral or expansion in total excavation, latest certified Compliance report (CCR) from IRO of conditions granted in existing EC needs to be submitted.
1.6	The PP should submit the real-time aerial video footage & video of the mining lease area and of the transportation route.
1.7	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).
1.8	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.
1.9	The PP should collect the Baseline data (BLD) in respect of initial level of the mining lease. For this permanent bench marks (BM) needs to be established at prominent location preferably close to mining leases in question and should have precisely known relationship to the level datum of the area, typically mean sea level.
1.10	In case of sand mining, the entire mining lease area should be divided suitably into grids of 25 m x 25 m with the help of sections across the width of river and along the direction of flow of the river. The levels (MSL & RL) of the corner point of each grid needs to be recorded. Each Grid should be suitably numbered for identification. PP should identify grids which will be worked out and grids which will come under no mining zone i.e. safety barriers from the river bank. PP should comply with the sustainable sand mining management guidelines 2016 and enforcement and monitoring guidelines, 2020 etc.
1.11	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.
1.12	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
1.13	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.
1.14	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
1.15	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.
1.16	Compliance of the Ministry's Office Memorandum No. F: 3-50/2017-IA.III (Pt.), dated 30.05.2018 on the

Sr. No.	Terms of Reference
	judgment of Hon'ble Supreme Court, dated the 2nd August, 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India needs to be submitted and included in the EIA/EMP Report.

2. Forest

Sr. No.	Terms of Reference
2.1	PP shall submit a certificate from Chief Conservator of Forests regarding involvement of Forest Land in the mining lease area if any. In case forest land is involved i) PP should submit the proof of application made for obtaining forest clearance and ii) a map clearly showing the forest & non-forest area.
2.2	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.
2.3	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.
2.4	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

3. Court Matters

Sr. No.	Terms of Reference
3.1	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

4. Land Environment

Sr. No.	Terms of Reference
4.1	PP should submit the details of survey number [viz. survey no, area in hectare, classification of land (government, private, forest, grazing land etc.), villages] duly authenticated by State Government, falling in the mining lease area.
4.2	The study area will comprise of 10km 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.
4.3	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
4.4	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.

5. Wildlife

Sr. No.	Terms of Reference
5.1	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.
5.2	A detailed biological study of the study area [core zone and buffer zone] 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. PP shall submit list of Schedule-1 species present in core and buffer zone duly authenticated by CWLW. 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/Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost. Proof of its submission of conservation plan to the CWLW needs to be submitted.
5.3	PP shall submit a certificate from Chief Wildlife Warden regarding distance of mining lease from the protected area falling within 10 KM of the mining lease. In case project requires clearance under Wildlife (Protection) Act, 1972 then copy of application made for the same needs to be submitted.

6. Baseline Environment

Sr. No.	Terms of Reference
6.1	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.
6.2	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 windrose showing pre-dominant wind direction may also be indicated on the map.
6.3	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this, PP should submit the original test reports and certificates of the labs from which samples were analyzed.

7. Water Environment

Sr. No.	Terms of Reference
7.1	The water requirement for the Project, its availability and source should be furnished. Quantity of surface or ground water to be used for the Project should be indicated. A detailed water balance should also be provided. Submit the year wise target for reduction in consumption of the ground/surface water by

Sr. No.	Terms of Reference
	developing alternative source of water through rain water harvesting measures. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. The capital and recurring expenditure to be incurred needs to be submitted.
7.2	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.

8. Hydro Geology

Sr. No.	Terms of Reference
8.1	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.
8.2	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.
8.3	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 bench 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. In case of surface water is proposed to be utilized then Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

9. Transportation

Sr. No.	Terms of Reference
9.1	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.

10. Land Acquisition and R&R

Sr. No.	Terms of Reference
10.1	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.
10.2	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

Sr. No.	Terms of Reference
	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.

11. Socio-Economic Environment

Sr. No.	Terms of Reference
11.1	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.
11.2	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.
11.3	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.
11.4	Activity-wise time-bound action plan on the issues raised and commitment made during public hearing to be submitted as part of the final EMP Report in compliance of the Ministry's OM F.No.22-65/2017-IA.III dated 30th September, 2020.

12. Environmental Monitoring and Management

Sr. No.	Terms of Reference
12.1	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 proposed safeguard measures in each case should also be provided.
12.2	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.

13. Critically Polluted Areas, Aravali & CRZ

Sr. No.	Terms of Reference
13.1	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.

Sr. No.	Terms of Reference
13.2	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).

14. Risk Assessment & Disaster Management

Sr. No.	Terms of Reference
14.1	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.
14.2	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.
14.3	A Disaster Management Plan shall be prepared and included in the EIA/EMP Report.

15. Miscellaneous

Sr. No.	Terms of Reference
15.1	The 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.

16.

Sr. No.	Terms of Reference
16.1	An EIA-EMP Report would be prepared for a combined peak capacity ofMTPA for OC-cum-UG project which consists of MTPA in an ML/project area of ha for OC and MTPA for UG in an ML/project area of ha based on the generic structure specified in Appendix III of the EIA Notification 2006.
16.2	An EIA-EMP Report would be prepared for MTPA rated capacity to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for..... MTPA of coal production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.
16.3	The ToRs prescribed for both opencast and underground mining are applicable for opencast – cum-underground mining.
16.4	Information on the following aspects of the corporate Environment Responsibility should also be provided for opencast, underground and opencast-cum-underground Min
16.5	Corporate Environment Responsibility:
16.6	The Company must have a well laid down Environment Policy approved by the Board of Directors.
16.7	The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/ conditions.
16.8	The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.
16.9	To have proper checks and balances, the company should have a well laid down 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
16.10	The condition prescribed in standard ToR separately for opencast and under ground mine to also be followed and also of coal washery if located within lease area or near to the mine lease area
16.11	An EIA-EMP Report shall be prepared for..... MTPA peak capacity in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.
16.12	An EIA-EMP Report would be prepared for..... MTPA peak capacity to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for MTPA of coal production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.
16.13	If the washery is located within the mine lease or near to the mine lease its location should be cited separately also, providing pillar cordinates and site layout plan. Insuch cases cumulative impact of mine operation with washery to be assessd and EMP measure to be drawn to the worst scenario
16.14	Plan of mechanized transportation of coal to coal washery also for rejects and washed coal to be drawn

Sr. No.	Terms of Reference
16.15	Propoer KML file with pin drop and coordinate of mine at 500-1000 m interval be provided
16.16	A toposheet specifying locations of the State, District and Project site should be provided.
16.17	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines, washery and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also.
16.18	Land use map (1: 50,000 scale) based on a recent satellite imagery of the study area may also be provided with explanatory note on the land use.
16.19	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.
16.20	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.
16.21	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, CHP, ETP, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.
16.22	In case of any proposed diversion of nallah/canal/river, the proposed route of diversion/modification of drainage and their realignment, construction of embankment etc. should also be shown on the map as per the approval of Irrigation and flood control Department of the concerned state.
16.23	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need elaboration in form of lengthe, quantity and quality of water to be diverted
16.24	Prior in principle approval from the respective state govt shall be required in cases where PP proposes diversion of river/ stream/ nallah/ drains. However, state approval shall not be finally considered before the appraisal by EAC. PP shall have submitted detailed project report in case where diversion is required with emphasis on hydrological study
16.25	Similarly if the project involves diversion of any road/railway line passing through the ML/project area, the proposed route of diversion and its realignment should be shown in the map along with the status of the approval of the competent authority.

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16.26	<p>Break up of lease/project area as per different land uses and their stage of acquisition should be provided. LANDUSE DETAILS FOR OPENCAST PROJECT should be given as per the following table:</p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Landuse</th> <th>Within ML area/project area (ha)</th> <th>Outside ML area/project area (ha)</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Agricultural land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Forest land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Wasteland</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Grazing land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Surface water bodies</td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>Settlements</td> <td></td> <td></td> <td></td> </tr> <tr> <td>7</td> <td>Others (specify)</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>Total</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Sl. No.	Landuse	Within ML area/project area (ha)	Outside ML area/project area (ha)	Total	1	Agricultural land				2	Forest land				3	Wasteland				4	Grazing land				5	Surface water bodies				6	Settlements				7	Others (specify)					Total			
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16.27	Break-up of lease/project area as per mining plan should be provided.																																													
16.28	Impact of changes in the land use due to the project if the land is predominantly agricultural land/forestland/grazing land, should be provided.																																													
16.29	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.																																													
16.30	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.																																													
16.31	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.																																													
16.32	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided																																													

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16.33	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.
16.34	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.
16.35	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.
16.36	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted
16.37	Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.
16.38	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.
16.39	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.
16.40	Forest diversion shall be only proposed for coal bearing areas. No non-essential infrastructure, office, workshop etc shall be propsoed or developed in forest area. No forest area shall be used for OB dump, accordingly Mine plan to be prepared
16.41	Detail of OB recovery for reutilization of minerals from mining shall be explored
16.42	OB dump management from its extraction, transportation to reutilization, disposal / backfilling, to be carry on in a manner to mininmize its impact. A detail to be furnished in EIA/EMP report
16.43	Detailed water balance should be provided. The break-up of water requirement for the various mine operations should be given separately.
16.44	Flow chart of water balance should be provided. Treatment of effluents from workshop, township, domestic wastewater, mine water discharge, etc. should be provided. Details of STP in colony and ETP in mine should be given. Recycling of water to the max. possible extent should be done.
16.45	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of

Sr. No.	Terms of Reference
	Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs
16.46	PP shall propose and explore to use LNG/CNG based mining machineries and trucks for mining operation and transportation of coal. The measures adopted to conserve energy or use of renewable sources shall be submitted.
16.47	PP to evaluate the green house emission gases from the mine operation/ washery plant and corresponding carbon absorption plan.
16.48	Site specific impact assessment with its respective measure to be provided
16.49	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.
16.50	Impact of blasting, noise and vibrations should be given.
16.51	Impacts of mining on the AAQ and predictions based on modeling using the ISCST-3 (Revised) or latest model should be provided.
16.52	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.
16.53	Effort be made to reduce/eliminate road transport of coal inside and outside mine and for mechanized loading of coal through CHP/ Silo into wagons and trucks/tippers.
16.54	Details of waste OB and topsoil generated as per the approved calendar programme, and their management shown in figures as well explanatory notes tables giving progressive development and mine closure plan, green belt development, backfilling programme and conceptual post mining land use should be given. OB dump heights and terracing based on slope stability studies with a max of 28o angle as the ultimate slope should be given. Sections of final dumps (both longitudinal and cross section) with relation to the adjacent area should be shown.
16.55	Efforts be made for maximising progressive internal dumping of O.B., sequential mining, external dump on coal bearing area and later rehandling into the mine void.--to reduce land degradation.
16.56	Impact of change in land use due to mining operations and plan for restoration of the mined area to its original land use should be provided.
16.57	Progressive Green belt and ecological restoration /afforestation plan (both in text, figures and in theAdequate greenbelt nearby areas, coal stock yard and transportaion area of coal shall be provided with details of species selected and survival rate. Adequate greenbelt nearby areas, coal stock yard and transportaion area of coal shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route and CHP. Table 2 : Stage Wise Cumulative Plantation

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16.58	<p>Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre-mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished. Table 3: Post-Mining Landuse Pattern of ML/Project Area (ha)</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 5%;">S.N.</td> <td style="width: 35%;">Land use during Mining</td> <td colspan="4" style="text-align: center;">Land Use (ha)</td> <td style="width: 10%;"></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">Plantation</td> <td style="text-align: center;">Water Body</td> <td style="text-align: center;">Public Use</td> <td style="text-align: center;">Undisturbed</td> <td style="text-align: center;">Total</td> </tr> <tr> <td>1</td> <td>External OB Dump</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Top soil Dump</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Excavation</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Roads</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Built up area</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>Green Belt</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>7</td> <td>Undisturbed Area</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>Total</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						S.N.	Land use during Mining	Land Use (ha)							Plantation	Water Body	Public Use	Undisturbed	Total	1	External OB Dump						2	Top soil Dump						3	Excavation						4	Roads						5	Built up area						6	Green Belt						7	Undisturbed Area							Total																																	
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16.59	Occupational health issues. Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower in the mine should be given.
16.60	Site specific Risk Assessment and Disaster Preparedness and Management Plan should be provided.
16.61	(i)Integration of the Env. Management Plan with measures for minimizing use of natural resources - water, land, energy, etc. should be carried out.
16.62	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.
16.63	Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.
16.64	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.
16.65	a) The Company must have a well laid down Environment Policy approved by the Board of Directors.
16.66	b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.
16.67	c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.
16.68	d) To have proper checks and balances, the company should have a well laid down 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.
16.69	f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.
16.70	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.
16.71	Status of any litigations/ court cases filed/pending on the project should be provided.
16.72	Submission of sample test analysis of Characteristics of coal: This should include details on grade of coal and other characteristics such as ash content, S and heavy metals including levels of Hg, As, Pb, Cr etc.
16.73	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.
16.74	FOREST CLEARANCE: Details on the Forest Clearance should be given as per the format given:

Sr. No.	Terms of Reference
	<p>TOTAL PROJECT AREA (ha) TOTAL FORESTLAND (ha) Balance area for which FC is obtained</p> <p>Status of appl for diversion of forest land</p> <p>Date of FC</p> <p>If more than, provide details of each FC</p>
16.75	PP shall submit clarification from PCCF that mine does not falls under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.
16.76	Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users in the upstream and downstream of the project site. should be given.
16.77	In case of expansion of the proposal, the status of the work done/activities as per mining plan and mine closure plan and progressive reclamation of OB dump shall be detailed in EIA/ EMP report
16.78	A copy of application submitted for 5 star rating system to Ministry of coal for expansion cases may be provided. Certificate /rating given to project shall be provided with EIA-EMP report
16.79	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes
16.80	Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.
16.81	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification)
16.82	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter,s section.
16.83	An EIA-EMP Report shall be prepared for peak capacity (.....MTPA)operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.
16.84	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for..... MTPA of coal production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.
16.85	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines, coal washery and other polluting sources. In case of

Sr. No.	Terms of Reference																																																
	ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also																																																
16.86	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.																																																
16.87	<p>Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights</p> <table border="1"> <thead> <tr> <th>S.N</th> <th>ML/Project Land use</th> <th>Area under Surface Rights(ha)</th> <th>Area Under Mining Rights(ha)</th> <th>Area under Both (ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Agricultural land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Forest Land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Grazing Land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Settlements</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Others (specify)</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>S.N.</th> <th>Details</th> <th>Area (ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Buildings</td> <td></td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td></td> </tr> <tr> <td>3</td> <td>Roads</td> <td></td> </tr> <tr> <td>4</td> <td>Others (specify)</td> <td></td> </tr> <tr> <td></td> <td>Total</td> <td></td> </tr> </tbody> </table>	S.N	ML/Project Land use	Area under Surface Rights(ha)	Area Under Mining Rights(ha)	Area under Both (ha)	1	Agricultural land				2	Forest Land				3	Grazing Land				4	Settlements				5	Others (specify)				S.N.	Details	Area (ha)	1	Buildings		2	Infrastructure		3	Roads		4	Others (specify)			Total	
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16.88	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.																																																
16.89	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.																																																
16.90	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.																																																
16.91	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the																																																

Sr. No.	Terms of Reference																								
	competing users should be provided.																								
16.92	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of coal. The measures adopted to conserve energy or use of renewable sources shall be explored																								
16.93	PP shall explore the use of vent gases as generated from under ground Mine for use of energy generation/ in house energy consumption																								
16.94	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.																								
16.95	Impact of stowing by using coal washery rejects/ flyash/ bottom ash shall be assessed in term of leachate generation and its characteristics																								
16.96	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, coal handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.																								
16.97	Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.																								
16.98	The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.																								
16.99	Impacts of CHP, if any on air and water quality should be given. A flow chart showing water balance along with the details of zero discharge should be provided.																								
16.100	Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre-mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.																								
16.101	Adequate greenbelt nearby areas, coal stock yard and transportaion area of coal shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route and CHP.																								
16.102	e) Environment Managment Cell and its responsibilities to be clearly spleel out in EIA/ EMP report																								
16.103	<p>Details on the Forest Clearance should be given as per the format given:</p> <table border="0"> <tr> <td>Total ML Total</td> <td>Date of Extent</td> <td>of Balance area for which</td> <td>Status of appl For</td> </tr> <tr> <td>Project Area Forest</td> <td>FC</td> <td>Forest Land</td> <td>FC is yet to be obtained</td> </tr> <tr> <td>(ha)</td> <td>land (ha)</td> <td></td> <td>diversion of forest land</td> </tr> <tr> <td></td> <td>If more than one</td> <td></td> <td></td> </tr> <tr> <td></td> <td>provide details of each</td> <td></td> <td></td> </tr> <tr> <td></td> <td>FC</td> <td></td> <td></td> </tr> </table>	Total ML Total	Date of Extent	of Balance area for which	Status of appl For	Project Area Forest	FC	Forest Land	FC is yet to be obtained	(ha)	land (ha)		diversion of forest land		If more than one				provide details of each				FC		
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Sr. No.	Terms of Reference
16.104	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report

Additional Terms of Reference

1. The PP shall submit the latest approved mining plan and closure plan.
2. The PP shall submit the latest approved DSR from the Mining Department.
3. The PP shall submit the fresh scientific/drone based replenishment study approved by the Competent Authority.
4. The PP shall submit an affidavit to the effect that all the Khasra Numbers and Latitudes/Longitudes mentioned in the EIA report are correct.
5. The PP shall submit the Green plan details.
6. The PP shall submit the copy of LOI.
7. The Proponent should collect the baseline data in respect of initial level of the mining lease. For this permanent bench marks (BM) needs to be established at prominent location preferably close to mining leases in question and should have precisely known relationship to the level datum of the area, typically mean sea level. The entire mining lease should be divided suitably in the grids of 25 Meter x 25 Meters with the help of sections across the width of river and along the direction of flow of the river. The levels (MSL & RL) of the corner point of each grid need to be recorded. Each Grid should be suitably numbered for identification. PP should identify grids which will be worked out and grids which will come under no mining zone i.e. safety barriers from the river bank, safety barrier at lease boundary, restrictions as per condition of Lol/Mining Lease deed, restriction as Mineral Concession Rule of the Haryana State, restrictions as per sustainable sand mining management guidelines 2016, restriction as per DSR etc. The PP should ascertain the level of the river bed with the help of sections drawn across the width of the rivers and along the direction of flow of the river and based on this define the depth of mining of each grid. The PP should provide in tabular format the details of the grid viz. wise material availability, dimension of grid, location of grid (latitude, longitude, MSL and level from outside ground level of the corner points), average level of grid (AMSL and RL), depth of mining in each grid, area, volume, grids under mining zone and those left under no mining zone etc. The PP should submit surveyed data so collected in the excel or CSV file so that the same can be readily used for verification in CAD or Data mine Software. In addition to this soft & hard copy of all the plan & section needs to be submitted.
8. PP should suitably name each section line. Section Plan for both sections drawn across the river and along the direction of the river needs to be submitted. Each Section should have level on vertical axis and distance from the bank of river on horizontal axis. For the section along the direction of the river the levels to be shown on vertical axis and distance from upstream to downstream should be shown on horizontal axis.
9. The PP should prepare the Mining Plan based on the above survey. The information sought above needs to be a part of the mining plan. In the mining plan year wise production plan should be prepared in three plates for each year. Plat-1 show the mine working for the pre- monsoon period (1st APR- 30th June), Plate-2 should for the period (1st July-15th Sep) as the mining lease area needs to be left for the replenishment of the river bed mineral and no mining should be proposed in thus period and plat-3 show the mine working after replenishment of the river bed i.e. post monsoon period (16th Sep-31st March). The period of monsoon may also be defined in consultation with State Government.
10. PP should specifically mention in the mining plan that in the subsequent scheme of mining/review of mining plan, the year wise data pertaining to replenishment study (at five years) shall be provided which include the level (AMSL & RL) of river bed recorded before and after the monsoon, year wise replenishment quantity, all plan & sections of the replenishment study for the past five years.

11. PP should submit an undertaking by way of affidavit as required as per Ministry's O.M No 3- 50/2017 - 1A. IM) dated 30.05.2018 to comply with all the statutory requirements and judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors.

12. PP should include in EIA Report details of all the statutory clearances, permissions, No objection certificates, consents etc. required for this project under various Acts, Rules and regulations and their status or estimated timeline after grant of EC.

13. The PP should submit the revenue plan, revenue plan superimposed on the satellite imaginary clearly demarcate the Govt. land, private land, agricultural land.

14. The PP should clearly bring out the protective and mitigative measures to be taken for the nearby habitation and religious structures in line with the Ministry's O.M. No. Z- 11013/57/2014- IA. II (M) dated 29.10.2014.

15. The PP should submit the detailed plan in tabular format (year-wise for life of mine) for afforestation and green belt development in and around the mining lease. The PP should submit the number of saplings to be planted, area to be covered under afforestation & green belt, location of plantation, target for survival rate and budget earmarked for the afforestation & green belt development. In addition to this PP should show on a surface plan (5 year interval for life of mine) of suitable scale the area to be covered under afforestation & green belt clearly mentioning the latitude and longitude of the area to be covered during each 5 years.

16. PP should submit the measures to be adopted for prevention of illegal mining and pilferage of mineral.

18. The PP shall carry out the study of Ecological effect of particulate matter on the flora and fauna.

19. The PP shall submit the undertaking that mining will be carried out in accordance with all other provisions as applicable under the Mines Act, 1952, Mines and Minerals (Development and Regulation) Act, 1957, Forest (Conservation) Act, 1980 and Environment (Protection Act), 1986 and the rules made there under, wild life (Protection) Act 1972, water (Prevention and control of pollution) Act 1974 and Air (Prevention and Control of Pollution) Act, 1981.

20. The PP should submit an affidavit that no JCB will be used for mining and only semi-mechanized mining will be carried out.

21. The PP shall submit that no illegal mining has taken place in the mining lease area and no illegal mining will be allowed during operation of mine.

22. The PP shall get the EIA study conducted by accredited agency for the use of large number of trucks/tippers including the impact of load and frequency of large number of machinery in the mining lease area.

Annexure 2

Details of Products & By-products

Name of the product /By-product	Product / By-product	Quantity	Unit	Mode of Transport / Transmission	Remarks (eg. CAS number)
Sand (Minor Mineral) from Riverbed	Product	4335000	MTPA	Road	Mineral will be transported by trucks/dumpers from site to client.

ANNEXURES – 3.1
ON SITE (HOURLY)
MICRO-
METEOROLOGY DATA

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
01-03-2024	1	19.6	72.0	22.5	NNE	1.8	0.5	0.0	0.0
01-03-2024	2	19.1	69.0	67.5	ENE	1.8	0.5	0.0	0.0
01-03-2024	3	18.6	67.0	135.0	SE	1.8	0.5	0.0	0.0
01-03-2024	4	17.8	71.0	135.0	SE	1.8	0.5	0.0	0.0
01-03-2024	5	17.5	69.0	180.0	S	9.4	2.6	0.0	0.0
01-03-2024	6	18.3	64.0	112.4	ESE	9.4	2.6	0.0	0.0
01-03-2024	7	19.9	62.0	157.5	SES	9.4	2.6	0.0	0.0
01-03-2024	8	21.4	60.0	202.4	SSW	15.1	4.2	0.0	0.0
01-03-2024	9	24.1	58.2	270.0	W	13.3	3.7	0.0	0.0
01-03-2024	10	26.3	55.5	270.0	W	15.1	4.2	0.0	0.0
01-03-2024	11	27.4	53.7	45.0	NE	16.6	4.6	0.0	0.0
01-03-2024	12	28.5	52.8	315.0	NW	13.3	3.7	0.0	0.0
01-03-2024	13	30.4	51.7	315.0	NW	18.7	5.2	0.0	0.0
01-03-2024	14	31.3	51.3	315.0	NW	13.7	3.8	0.0	0.0
01-03-2024	15	33.2	50.8	292.4	WNW	15.5	4.3	0.0	0.0
01-03-2024	16	34.4	50.4	315.0	NW	7.9	2.2	0.0	0.0
01-03-2024	17	36.2	50.1	315.0	NW	9.4	2.6	0.0	0.0
01-03-2024	18	34.6	51.0	247.0	WSW	7.9	2.2	0.0	0.0
01-03-2024	19	32.2	53.0	225.0	SW	9.4	2.6	0.0	0.0
01-03-2024	20	29.4	55.6	202.0	SSW	7.9	2.2	0.0	0.0
01-03-2024	21	26.6	58.3	270.0	W	6.1	1.7	0.0	0.0
01-03-2024	22	23.6	60.2	333.0	NWN	2.2	0.6	0.0	0.0
01-03-2024	23	21.2	63.5	45.0	NE	4.7	1.3	0.0	0.0
01-03-2024	24	19.8	65.1	135.0	SE	2.1	0.6	0.0	0.0
02-03-2024	1	19.4	67.3	135.0	SE	2.9	0.8	0.0	0.0
02-03-2024	2	18.8	69.0	15.0	NNE	2.2	0.6	0.0	0.0
02-03-2024	3	18.3	71.0	18.0	NNE	4.7	1.3	0.0	0.0
02-03-2024	4	17.9	67.0	360.0	N	7.9	2.2	0.0	0.0
02-03-2024	5	17.7	64.0	360.0	N	9.7	2.7	0.0	0.0
02-03-2024	6	18.5	61.0	102.0	ESE	8.6	2.4	0.0	0.0
02-03-2024	7	21.1	59.0	108.0	ESE	8.6	2.4	0.0	0.0
02-03-2024	8	23.2	57.0	45.0	NE	15.1	4.2	0.0	0.0
02-03-2024	9	24.8	58.0	270.0	W	13.3	3.7	0.0	0.0
02-03-2024	10	27.2	56.0	270.0	W	9.4	2.6	0.0	0.0
02-03-2024	11	28.6	55.0	255.0	WSW	9.4	2.6	0.0	0.0
02-03-2024	12	30.3	53.0	315.0	NW	13.3	3.7	0.0	0.0
02-03-2024	13	31.6	51.0	45.0	NE	14.0	3.9	0.0	0.0
02-03-2024	14	33.1	50.6	315.0	NW	15.5	4.3	0.0	0.0
02-03-2024	15	33.9	50.3	315.0	NW	13.3	3.7	0.0	0.0
02-03-2024	16	34.3	50.0	315.0	NW	15.5	4.3	0.0	0.0
02-03-2024	17	33.7	53.0	315.0	NW	13.3	3.7	0.0	0.0
02-03-2024	18	31.2	55.0	288.0	WNW	10.1	2.8	0.0	0.0
02-03-2024	19	30.1	58.5	295.0	WNW	2.9	0.8	0.0	0.0
02-03-2024	20	28.6	60.0	135.0	SE	5.0	1.4	0.0	0.0
02-03-2024	21	26.8	63.0	135.0	SE	4.7	1.3	0.0	0.0
02-03-2024	22	24.8	64.0	345.0	NWN	1.8	0.5	0.0	0.0
02-03-2024	23	22.2	66.0	45.0	NE	0.7	0.2	0.0	0.0
02-03-2024	24	20.3	69.0	45.0	NE	2.5	0.7	0.0	0.0
03-03-2024	1	19.7	68.0	165.0	SES	7.9	2.2	0.0	0.0
03-03-2024	2	19.4	68.0	160.0	SES	9.4	2.6	0.0	0.0
03-03-2024	3	19.1	67.0	155.0	SES	13.3	3.7	0.0	0.0
03-03-2024	4	18.7	63.0	225.0	SW	1.4	0.4	0.0	0.0
03-03-2024	5	19.3	63.0	225.0	SW	6.5	1.8	0.0	0.0
03-03-2024	6	19.8	64.0	120.0	ESE	1.8	0.5	0.0	0.0
03-03-2024	7	21.1	61.0	166.0	SES	9.7	2.7	0.0	0.0
03-03-2024	8	22.7	59.0	115.0	ESE	5.0	1.4	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
03-03-2024	9	24.6	58.0	45.0	NE	1.8	0.5	0.0	0.0
03-03-2024	10	26.6	56.0	45.0	NE	12.6	3.5	0.0	0.0
03-03-2024	11	28.1	55.0	180.0	S	7.9	2.2	0.0	0.0
03-03-2024	12	29.4	53.0	270.0	W	15.1	4.2	0.0	0.0
03-03-2024	13	30.9	51.0	270.0	W	5.8	1.6	0.0	0.0
03-03-2024	14	31.7	51.0	240.0	WSW	13.0	3.6	0.0	0.0
03-03-2024	15	32.5	50.6	315.0	NW	9.0	2.5	0.0	0.0
03-03-2024	16	33.3	50.0	256.0	WSW	11.5	3.2	0.0	0.0
03-03-2024	17	32.6	50.6	315.0	NW	11.9	3.3	0.0	0.0
03-03-2024	18	31.2	51.0	180.0	S	16.2	4.5	0.0	0.0
03-03-2024	19	29.3	52.0	58.0	ENE	11.9	3.3	0.0	0.0
03-03-2024	20	27.4	53.0	69.0	ENE	0.7	0.2	0.0	0.0
03-03-2024	21	25.6	54.0	360.0	N	4.7	1.3	0.0	0.0
03-03-2024	22	23.2	55.0	225.0	SW	2.2	0.6	0.0	0.0
03-03-2024	23	21.4	58.0	155.0	SES	13.0	3.6	0.0	0.0
03-03-2024	24	20.3	60.0	165.0	SES	2.5	0.7	0.0	0.0
04-03-2024	1	19.9	64.0	135.0	SE	5.4	1.5	0.0	0.0
04-03-2024	2	19.6	64.0	15.0	NNE	1.6	0.5	0.0	0.0
04-03-2024	3	19.1	67.0	25.0	NNE	3.2	0.9	0.0	0.0
04-03-2024	4	18.7	67.0	180.0	S	9.0	2.5	0.0	0.0
04-03-2024	5	18.4	64.0	180.0	S	7.9	2.2	0.0	0.0
04-03-2024	6	19.3	61.0	180.0	S	6.5	1.8	0.0	0.0
04-03-2024	7	20.2	58.0	180.0	S	2.5	0.7	0.0	0.0
04-03-2024	8	21.3	55.0	60.0	ENE	12.6	3.5	0.0	0.0
04-03-2024	9	23.6	54.0	75.0	ENE	7.9	2.2	0.0	0.0
04-03-2024	10	25.5	52.0	360.0	N	12.2	3.4	0.0	0.0
04-03-2024	11	27.2	51.0	315.0	NW	13.3	3.7	0.0	0.0
04-03-2024	12	28.6	49.0	315.0	NW	15.1	4.2	0.0	0.0
04-03-2024	13	29.6	48.0	315.0	NW	15.5	4.3	0.0	0.0
04-03-2024	14	31.1	46.5	295.0	WNW	10.1	2.8	0.0	0.0
04-03-2024	15	32.1	46.0	45.0	NE	14.4	4.0	0.0	0.0
04-03-2024	16	32.7	45.5	45.0	NE	7.9	2.2	0.0	0.0
04-03-2024	17	32.4	47.0	245.0	WSW	8.6	2.4	0.0	0.0
04-03-2024	18	31.2	47.6	250.0	WSW	11.5	3.2	0.0	0.0
04-03-2024	19	29.8	48.8	180.0	S	13.3	3.7	0.0	0.0
04-03-2024	20	27.7	50.0	180.0	S	9.7	2.7	0.0	0.0
04-03-2024	21	25.4	54.0	180.0	S	9.4	2.6	0.0	0.0
04-03-2024	22	24.0	57.0	115.0	ESE	10.1	2.8	0.0	0.0
04-03-2024	23	21.8	62.0	225.0	SW	6.1	1.7	0.0	0.0
04-03-2024	24	21.1	65.0	180.0	S	1.8	0.5	0.0	0.0
05-03-2024	1	20.7	68.0	180.0	S	2.2	0.6	0.0	0.0
05-03-2024	2	20.4	68.0	180.0	S	5.6	1.5	0.0	0.0
05-03-2024	3	20.1	68.0	180.0	S	2.2	0.6	0.0	0.0
05-03-2024	4	19.6	67.0	180.0	S	6.5	1.8	0.0	0.0
05-03-2024	5	19.9	64.0	180.0	S	4.2	1.2	0.0	0.0
05-03-2024	6	21.3	61.0	59.0	ENE	6.5	1.8	0.0	0.0
05-03-2024	7	22.2	58.0	65.0	ENE	8.6	2.4	0.0	0.0
05-03-2024	8	23.0	55.0	270.0	W	8.3	2.3	0.0	0.0
05-03-2024	9	24.4	53.0	315.0	NW	12.2	3.4	0.0	0.0
05-03-2024	10	26.0	52.0	315.0	NW	14.0	3.9	0.0	0.0
05-03-2024	11	27.6	51.5	315.0	NW	12.2	3.4	0.0	0.0
05-03-2024	12	29.2	51.2	315.0	NW	13.0	3.6	0.0	0.0
05-03-2024	13	30.3	50.8	288.0	WNW	16.2	4.5	0.0	0.0
05-03-2024	14	30.9	50.4	315.0	NW	8.6	2.4	0.0	0.0
05-03-2024	15	31.7	49.6	315.0	NW	16.9	4.7	0.0	0.0
05-03-2024	16	32.9	49.2	240.0	WSW	13.7	3.8	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
05-03-2024	17	32.1	48.6	245.0	WSW	16.0	4.5	0.0	0.0
05-03-2024	18	31.4	49.5	315.0	NW	15.8	4.4	0.0	0.0
05-03-2024	19	29.5	52.0	90.0	E	13.3	3.7	0.0	0.0
05-03-2024	20	27.1	54.6	195.0	SSW	11.9	3.3	0.0	0.0
05-03-2024	21	24.7	57.0	45.0	NE	9.7	2.7	0.0	0.0
05-03-2024	22	23.2	59.0	360.0	N	1.4	0.4	0.0	0.0
05-03-2024	23	21.0	61.0	225.0	SW	1.4	0.4	0.0	0.0
05-03-2024	24	20.2	64.0	115.0	ESE	5.0	1.4	0.0	0.0
06-03-2024	1	19.4	63.0	165.0	SES	0.7	0.2	0.0	0.0
06-03-2024	2	18.9	64.5	155.0	SES	6.8	1.9	0.0	0.0
06-03-2024	3	18.5	67.0	270.0	W	9.7	2.7	0.0	0.0
06-03-2024	4	18.1	66.0	22.0	NNE	5.8	1.6	0.0	0.0
06-03-2024	5	18.9	63.0	360.0	N	9.4	2.6	0.0	0.0
06-03-2024	6	19.4	61.6	225.0	SW	4.0	1.1	0.0	0.0
06-03-2024	7	20.5	60.0	45.0	NE	7.9	2.2	0.0	0.0
06-03-2024	8	21.8	58.0	166.0	SES	13.0	3.6	0.0	0.0
06-03-2024	9	23.2	56.7	225.0	SW	15.8	4.4	0.0	0.0
06-03-2024	10	24.9	56.2	315.0	NW	15.1	4.2	0.0	0.0
06-03-2024	11	27.1	54.6	315.0	NW	18.4	5.1	0.0	0.0
06-03-2024	12	28.5	53.2	255.0	WSW	15.1	4.2	0.0	0.0
06-03-2024	13	29.8	52.1	315.0	NW	22.0	6.1	0.0	0.0
06-03-2024	14	31.1	51.4	285.0	WNW	19.4	5.4	0.0	0.0
06-03-2024	15	31.8	50.6	290.0	WNW	15.5	4.3	0.0	0.0
06-03-2024	16	32.1	48.7	295.0	WNW	13.3	3.7	0.0	0.0
06-03-2024	17	32.0	47.6	135.0	SE	7.9	2.2	0.0	0.0
06-03-2024	18	31.2	48.0	180.0	S	1.8	0.5	0.0	0.0
06-03-2024	19	29.2	49.0	65.0	ENE	12.6	3.5	0.0	0.0
06-03-2024	20	26.7	52.0	75.0	ENE	13.3	3.7	0.0	0.0
06-03-2024	21	24.3	57.0	360.0	N	19.1	5.3	0.0	0.0
06-03-2024	22	21.3	62.0	360.0	N	18.4	5.1	0.0	0.0
06-03-2024	23	19.6	68.0	115.0	ESE	15.1	4.2	0.0	0.0
06-03-2024	24	18.7	70.3	120.0	ESE	16.6	4.6	0.0	0.0
07-03-2024	1	18.1	71.0	116.0	ESE	9.0	2.5	0.0	0.0
07-03-2024	2	17.4	72.0	360.0	N	5.8	1.6	0.0	0.0
07-03-2024	3	16.9	72.5	360.0	N	3.2	0.9	0.0	0.0
07-03-2024	4	16.5	73.0	360.0	N	5.0	1.4	0.0	0.0
07-03-2024	5	15.4	73.5	360.0	N	13.3	3.7	0.0	0.0
07-03-2024	6	16.7	74.0	360.0	N	1.8	0.5	0.0	0.0
07-03-2024	7	18.8	74.0	225.0	SW	16.6	4.6	0.0	0.0
07-03-2024	8	22.1	72.6	225.0	SW	8.3	2.3	0.0	0.0
07-03-2024	9	24.1	71.0	45.0	NE	12.2	3.4	0.0	0.0
07-03-2024	10	26.3	70.0	155.0	SES	19.8	5.5	0.0	0.0
07-03-2024	11	27.4	68.6	270.0	W	13.7	3.8	0.0	0.0
07-03-2024	12	29.1	66.5	315.0	NW	19.1	5.3	0.0	0.0
07-03-2024	13	30.4	65.0	315.0	NW	18.4	5.1	0.0	0.0
07-03-2024	14	31.1	64.5	255.0	WSW	13.3	3.7	0.0	0.0
07-03-2024	15	31.6	64.0	315.0	NW	15.8	4.4	0.0	0.0
07-03-2024	16	33.1	63.5	315.0	NW	15.8	4.4	0.0	0.0
07-03-2024	17	32.7	63.3	255.0	WSW	13.3	3.7	0.0	0.0
07-03-2024	18	30.7	61.2	258.0	WSW	16.2	4.5	0.0	0.0
07-03-2024	19	29.1	58.8	180.0	S	12.6	3.5	0.0	0.0
07-03-2024	20	27.4	56.6	180.0	S	1.8	0.5	0.0	0.0
07-03-2024	21	26.1	59.4	65.0	ENE	1.1	0.3	0.0	0.0
07-03-2024	22	24.2	62.4	360.0	N	8.6	2.4	0.0	0.0
07-03-2024	23	21.9	64.3	360.0	N	1.4	0.4	0.0	0.0
07-03-2024	24	20.3	66.5	65.0	ENE	17.3	4.8	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
08-03-2024	1	19.1	67.6	111.0	ESE	9.4	2.6	0.0	0.0
08-03-2024	2	18.4	69.2	115.0	ESE	6.1	1.7	0.0	0.0
08-03-2024	3	17.8	70.3	45.0	NE	2.2	0.6	0.0	0.0
08-03-2024	4	17.3	71.0	360.0	N	7.2	2.0	0.0	0.0
08-03-2024	5	16.6	69.0	360.0	N	8.6	2.4	0.0	0.0
08-03-2024	6	17.9	70.0	115.0	ESE	2.9	0.8	0.0	0.0
08-03-2024	7	19.3	68.6	165.0	SES	7.9	2.2	0.0	0.0
08-03-2024	8	21.1	67.0	270.0	W	9.1	2.5	0.0	0.0
08-03-2024	9	23.2	65.0	270.0	W	14.4	4.0	0.0	0.0
08-03-2024	10	24.4	63.0	255.0	WSW	18.0	5.0	0.0	0.0
08-03-2024	11	26.2	60.0	45.0	NE	20.5	5.7	0.0	0.0
08-03-2024	12	28.1	58.0	315.0	NW	15.8	4.4	0.0	0.0
08-03-2024	13	30.2	57.0	315.0	NW	13.3	3.7	0.0	0.0
08-03-2024	14	31.4	55.6	315.0	NW	13.3	3.7	0.0	0.0
08-03-2024	15	32.2	54.3	315.0	NW	15.1	4.2	0.0	0.0
08-03-2024	16	32.7	53.2	315.0	NW	9.4	2.6	0.0	0.0
08-03-2024	17	32.0	56.0	315.0	NW	13.3	3.7	0.0	0.0
08-03-2024	18	30.3	58.9	135.0	SE	16.9	4.7	0.0	0.0
08-03-2024	19	28.2	61.0	135.0	SE	13.3	3.7	0.0	0.0
08-03-2024	20	26.5	63.6	135.0	SE	15.8	4.4	0.0	0.0
08-03-2024	21	24.1	66.6	20.0	NNE	13.3	3.7	0.0	0.0
08-03-2024	22	22.2	68.4	30.0	NNE	8.3	2.3	0.0	0.0
08-03-2024	23	20.1	70.6	180.0	S	2.5	0.7	0.0	0.0
08-03-2024	24	18.8	72.1	60.0	ENE	13.0	3.6	0.0	0.0
09-03-2024	1	17.6	69.0	360.0	N	2.2	0.6	0.0	0.0
09-03-2024	2	16.4	68.0	360.0	N	9.7	2.7	0.0	0.0
09-03-2024	3	15.4	67.0	165.0	SES	2.2	0.6	0.0	0.0
09-03-2024	4	14.9	70.0	168.0	SES	6.5	1.8	0.0	0.0
09-03-2024	5	14.4	71.0	167.0	SES	2.1	0.6	0.0	0.0
09-03-2024	6	16.2	71.0	163.0	SES	10.8	3.0	0.0	0.0
09-03-2024	7	17.5	69.0	168.0	SES	13.3	3.7	0.0	0.0
09-03-2024	8	19.5	67.0	45.0	NE	15.1	4.2	0.0	0.0
09-03-2024	9	22.1	65.0	270.0	W	15.8	4.4	0.0	0.0
09-03-2024	10	23.7	63.0	45.0	NE	19.4	5.4	0.0	0.0
09-03-2024	11	25.6	57.0	315.0	NW	13.3	3.7	0.0	0.0
09-03-2024	12	27.4	54.2	315.0	NW	15.1	4.2	0.0	0.0
09-03-2024	13	29.3	52.3	315.0	NW	16.6	4.6	0.0	0.0
09-03-2024	14	30.6	50.6	315.0	NW	13.3	3.7	0.0	0.0
09-03-2024	15	30.8	49.9	315.0	NW	16.9	4.7	0.0	0.0
09-03-2024	16	29.9	49.2	315.0	NW	15.1	4.2	0.0	0.0
09-03-2024	17	29.3	48.6	315.0	NW	15.5	4.3	0.0	0.0
09-03-2024	18	27.6	48.0	135.0	SE	18.0	5.0	0.0	0.0
09-03-2024	19	26.1	50.0	135.0	SE	9.7	2.7	0.0	0.0
09-03-2024	20	24.3	54.0	360.0	N	4.2	1.2	0.0	0.0
09-03-2024	21	22.4	58.0	45.0	NE	15.1	4.2	0.0	0.0
09-03-2024	22	21.2	63.0	360.0	N	4.2	1.2	0.0	0.0
09-03-2024	23	19.7	65.0	360.0	N	1.4	0.4	0.0	0.0
09-03-2024	24	18.6	69.0	108.0	ESE	2.1	0.6	0.0	0.0
10-03-2024	1	17.9	71.0	110.0	ESE	2.2	0.6	0.0	0.0
10-03-2024	2	17.4	71.0	135.0	SE	7.2	2.0	0.0	0.0
10-03-2024	3	16.8	68.0	135.0	SE	10.8	3.0	0.0	0.0
10-03-2024	4	16.2	65.0	335.0	NWN	10.8	3.0	0.0	0.0
10-03-2024	5	15.3	62.0	135.0	SE	14.4	4.0	0.0	0.0
10-03-2024	6	16.1	62.0	135.0	SE	1.8	0.5	0.0	0.0
10-03-2024	7	18.2	59.0	45.0	NE	7.2	2.0	0.0	0.0
10-03-2024	8	20.3	57.6	270.0	W	8.4	2.3	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
10-03-2024	9	22.6	55.0	315.0	NW	14.4	4.0	0.0	0.0
10-03-2024	10	24.2	54.0	315.0	NW	13.3	3.7	0.0	0.0
10-03-2024	11	25.7	52.0	315.0	NW	13.0	3.6	0.0	0.0
10-03-2024	12	27.1	50.0	315.0	NW	8.4	2.3	0.0	0.0
10-03-2024	13	28.0	49.7	315.0	NW	15.1	4.2	0.0	0.0
10-03-2024	14	28.9	48.6	315.0	NW	14.4	4.0	0.0	0.0
10-03-2024	15	30.3	48.3	315.0	NW	10.8	3.0	0.0	0.0
10-03-2024	16	31.2	47.8	315.0	NW	13.0	3.6	0.0	0.0
10-03-2024	17	31.0	47.6	315.0	NW	2.2	0.6	0.0	0.0
10-03-2024	18	28.9	49.0	135.0	SE	14.4	4.0	0.0	0.0
10-03-2024	19	28.1	52.2	135.0	SE	10.8	3.0	0.0	0.0
10-03-2024	20	26.7	54.0	333.0	NWN	4.0	1.1	0.0	0.0
10-03-2024	21	25.1	56.0	332.0	NWN	2.1	0.6	0.0	0.0
10-03-2024	22	23.6	58.0	110.0	ESE	14.4	4.0	0.0	0.0
10-03-2024	23	22.0	63.0	225.0	SW	1.8	0.5	0.0	0.0
10-03-2024	24	20.6	65.0	315.0	NW	9.1	2.5	0.0	0.0
11-03-2024	1	19.7	68.0	166.0	SES	4.7	1.3	0.0	0.0
11-03-2024	2	19.1	68.0	110.0	ESE	10.5	2.9	0.0	0.0
11-03-2024	3	18.7	68.0	225.0	SW	2.1	0.6	0.0	0.0
11-03-2024	4	18.5	69.0	148.0	SES	14.4	4.0	0.0	0.0
11-03-2024	5	19.6	70.0	151.0	SES	7.9	2.2	0.0	0.0
11-03-2024	6	20.9	70.0	180.0	S	10.8	3.0	0.0	0.0
11-03-2024	7	22.2	67.0	270.0	W	3.6	1.0	0.0	0.0
11-03-2024	8	23.7	64.0	270.0	W	2.5	0.7	0.0	0.0
11-03-2024	9	25.5	61.0	270.0	W	12.6	3.5	0.0	0.0
11-03-2024	10	27.1	59.0	270.0	W	9.1	2.5	0.0	0.0
11-03-2024	11	28.8	58.0	45.0	NE	7.2	2.0	0.0	0.0
11-03-2024	12	29.7	55.0	315.0	NW	10.8	3.0	0.0	0.0
11-03-2024	13	30.5	53.0	315.0	NW	14.4	4.0	0.0	0.0
11-03-2024	14	31.3	51.3	270.0	W	16.2	4.5	0.0	0.0
11-03-2024	15	32.2	49.0	315.0	NW	7.9	2.2	0.0	0.0
11-03-2024	16	32.8	47.0	135.0	SE	14.4	4.0	0.0	0.0
11-03-2024	17	33.3	47.0	315.0	NW	1.8	0.5	0.0	0.0
11-03-2024	18	31.4	48.0	255.0	WSW	12.6	3.5	0.0	0.0
11-03-2024	19	29.2	52.0	315.0	NW	14.4	4.0	0.0	0.0
11-03-2024	20	27.2	53.0	315.0	NW	13.3	3.7	0.0	0.0
11-03-2024	21	25.6	54.0	315.0	NW	8.6	2.4	0.0	0.0
11-03-2024	22	23.3	59.0	315.0	NW	2.2	0.6	0.0	0.0
11-03-2024	23	21.4	65.0	315.0	NW	1.4	0.4	0.0	0.0
11-03-2024	24	20.6	68.0	327.0	NWN	2.8	0.8	0.0	0.0
12-03-2024	1	20.0	69.0	345.0	NWN	10.8	3.0	0.0	0.0
12-03-2024	2	19.8	70.0	90.0	E	2.1	0.6	0.0	0.0
12-03-2024	3	19.6	71.0	225.0	SW	1.4	0.4	0.0	0.0
12-03-2024	4	18.9	72.0	225.0	SW	2.5	0.7	0.0	0.0
12-03-2024	5	19.4	72.0	160.0	SES	6.5	1.8	0.0	0.0
12-03-2024	6	20.1	68.0	165.0	SES	10.8	3.0	0.0	0.0
12-03-2024	7	21.4	65.0	45.0	NE	14.4	4.0	0.0	0.0
12-03-2024	8	23.3	67.0	45.0	NE	7.9	2.2	0.0	0.0
12-03-2024	9	24.8	65.0	45.0	NE	8.3	2.3	0.0	0.0
12-03-2024	10	26.7	62.0	255.0	WSW	13.7	3.8	0.0	0.0
12-03-2024	11	28.4	60.0	254.0	WSW	22.3	6.2	0.0	0.0
12-03-2024	12	29.5	58.0	315.0	NW	13.3	3.7	0.0	0.0
12-03-2024	13	30.7	56.0	315.0	NW	15.1	4.2	0.0	0.0
12-03-2024	14	31.8	55.0	315.0	NW	18.4	5.1	0.0	0.0
12-03-2024	15	33.2	51.0	315.0	NW	14.6	4.1	0.0	0.0
12-03-2024	16	34.2	51.0	315.0	NW	13.7	3.8	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
12-03-2024	17	34.4	51.0	315.0	NW	15.3	4.3	0.0	0.0
12-03-2024	18	33.1	53.0	315.0	NW	15.3	4.3	0.0	0.0
12-03-2024	19	31.2	57.0	290.0	WNW	2.8	0.8	0.0	0.0
12-03-2024	20	29.1	61.0	290.0	WNW	2.2	0.6	0.0	0.0
12-03-2024	21	27.3	63.0	242.0	WSW	1.8	0.5	0.0	0.0
12-03-2024	22	25.2	65.0	270.0	W	2.5	0.7	0.0	0.0
12-03-2024	23	23.1	67.0	135.0	SE	2.1	0.6	0.0	0.0
12-03-2024	24	21.7	69.0	135.0	SE	2.5	0.7	0.0	0.0
13-03-2024	1	21.5	70.0	225.0	SW	1.8	0.5	0.0	0.0
13-03-2024	2	21.3	71.4	360.0	N	1.8	0.5	0.0	0.0
13-03-2024	3	21.4	72.5	180.0	S	1.4	0.4	0.0	0.0
13-03-2024	4	21.9	73.0	17.0	NNE	7.2	2.0	0.0	0.0
13-03-2024	5	22.6	74.0	45.0	NE	2.5	0.7	0.0	0.0
13-03-2024	6	23.3	74.5	270.0	W	3.6	1.0	0.0	0.0
13-03-2024	7	24.2	75.0	180.0	S	2.2	0.6	0.0	0.0
13-03-2024	8	25.4	73.0	21.0	NNE	3.6	1.0	0.0	0.0
13-03-2024	9	26.5	72.0	45.0	NE	7.2	2.0	0.0	0.0
13-03-2024	10	28.1	70.8	360.0	N	1.8	0.5	0.0	0.0
13-03-2024	11	29.6	69.6	360.0	N	9.7	2.7	0.0	0.0
13-03-2024	12	30.9	68.3	315.0	NW	13.3	3.7	0.0	0.0
13-03-2024	13	32.3	66.2	315.0	NW	7.9	2.2	0.0	0.0
13-03-2024	14	33.4	62.6	315.0	NW	13.7	3.8	0.0	0.0
13-03-2024	15	34.3	58.4	315.0	NW	14.4	4.0	0.0	0.0
13-03-2024	16	34.8	55.7	315.0	NW	3.2	0.9	0.0	0.0
13-03-2024	17	35.1	53.4	315.0	NW	14.4	4.0	0.0	0.0
13-03-2024	18	33.4	51.7	45.0	NE	2.2	0.6	0.0	0.0
13-03-2024	19	31.5	51.0	45.0	NE	13.3	3.7	0.0	0.0
13-03-2024	20	30.1	56.0	225.0	SW	5.6	1.5	0.0	0.0
13-03-2024	21	28.2	60.0	18.0	NNE	4.9	1.4	0.0	0.0
13-03-2024	22	25.7	63.0	225.0	SW	7.9	2.2	0.0	0.0
13-03-2024	23	23.6	65.0	225.0	SW	3.6	1.0	0.0	0.0
13-03-2024	24	22.2	66.3	225.0	SW	14.4	4.0	0.0	0.0
14-03-2024	1	21.9	67.6	180.0	S	3.6	1.0	0.0	0.0
14-03-2024	2	21.6	69.2	135.0	SE	4.9	1.4	0.0	0.0
14-03-2024	3	21.5	71.2	135.0	SE	2.2	0.6	0.0	0.0
14-03-2024	4	22.1	72.6	135.0	SE	3.2	0.9	0.0	0.0
14-03-2024	5	22.6	73.3	270.0	W	8.3	2.3	0.0	0.0
14-03-2024	6	23.1	74.2	270.0	W	9.0	2.5	0.0	0.0
14-03-2024	7	23.8	75.1	135.0	SE	2.2	0.6	0.0	0.0
14-03-2024	8	25.0	73.2	225.0	SW	6.8	1.9	0.0	0.0
14-03-2024	9	26.3	71.7	180.0	S	11.5	3.2	0.0	0.0
14-03-2024	10	27.6	68.6	315.0	NW	9.0	2.5	0.0	0.0
14-03-2024	11	29.2	66.3	315.0	NW	5.8	1.6	0.0	0.0
14-03-2024	12	30.4	64.2	315.0	NW	5.4	1.5	0.0	0.0
14-03-2024	13	32.1	62.7	315.0	NW	9.1	2.5	0.0	0.0
14-03-2024	14	33.1	61.8	315.0	NW	12.5	3.5	0.0	0.0
14-03-2024	15	34.0	58.4	315.0	NW	15.8	4.4	0.0	0.0
14-03-2024	16	34.4	55.6	315.0	NW	15.3	4.3	0.0	0.0
14-03-2024	17	34.7	54.4	315.0	NW	8.3	2.3	0.0	0.0
14-03-2024	18	32.4	57.3	315.0	NW	16.2	4.5	0.0	0.0
14-03-2024	19	30.7	58.8	135.0	SE	8.4	2.3	0.0	0.0
14-03-2024	20	28.3	60.3	135.0	SE	9.8	2.7	0.0	0.0
14-03-2024	21	25.7	61.4	135.0	SE	8.4	2.3	0.0	0.0
14-03-2024	22	23.9	63.0	135.0	SE	2.8	0.8	0.0	0.0
14-03-2024	23	22.7	64.2	345.0	NWN	2.2	0.6	0.0	0.0
14-03-2024	24	21.6	66.5	135.0	SE	2.1	0.6	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
15-03-2024	1	21.2	69.0	135.0	SE	2.5	0.7	0.0	0.0
15-03-2024	2	20.8	69.0	225.0	SW	1.8	0.5	0.0	0.0
15-03-2024	3	20.4	68.0	242.0	WSW	2.8	0.8	0.0	0.0
15-03-2024	4	20.1	73.0	270.0	W	4.2	1.2	0.0	0.0
15-03-2024	5	20.2	68.0	135.0	SE	5.4	1.5	0.0	0.0
15-03-2024	6	21.4	69.0	135.0	SE	4.9	1.4	0.0	0.0
15-03-2024	7	23.5	67.0	32.0	NNE	2.5	0.7	0.0	0.0
15-03-2024	8	25.6	68.0	32.0	NNE	9.8	2.7	0.0	0.0
15-03-2024	9	28.2	64.0	180.0	S	2.2	0.6	0.0	0.0
15-03-2024	10	30.1	65.0	315.0	NW	9.9	2.7	0.0	0.0
15-03-2024	11	31.0	63.0	45.0	NE	9.3	2.6	0.0	0.0
15-03-2024	12	32.3	58.0	315.0	NW	2.5	0.7	0.0	0.0
15-03-2024	13	33.0	56.0	315.0	NW	13.4	3.7	0.0	0.0
15-03-2024	14	34.2	51.0	270.0	W	12.8	3.5	0.0	0.0
15-03-2024	15	34.9	49.5	270.0	W	10.8	3.0	0.0	0.0
15-03-2024	16	35.3	48.4	245.0	WSW	2.2	0.6	0.0	0.0
15-03-2024	17	35.2	48.0	255.0	WSW	3.6	1.0	0.0	0.0
15-03-2024	18	33.7	50.0	315.0	NW	8.6	2.4	0.0	0.0
15-03-2024	19	30.9	51.0	135.0	SE	9.3	2.6	0.0	0.0
15-03-2024	20	28.8	52.0	135.0	SE	2.5	0.7	0.0	0.0
15-03-2024	21	26.5	52.0	330.0	NWN	9.3	2.6	0.0	0.0
15-03-2024	22	24.6	57.0	340.0	NWN	1.7	0.5	0.0	0.0
15-03-2024	23	23.2	63.0	135.0	SE	1.7	0.5	0.0	0.0
15-03-2024	24	22.2	66.0	135.0	SE	2.2	0.6	0.0	0.0
16-03-2024	1	21.9	66.0	225.0	SW	2.2	0.6	0.0	0.0
16-03-2024	2	21.7	69.0	225.0	SW	5.2	1.5	0.0	0.0
16-03-2024	3	21.5	69.0	180.0	S	1.8	0.5	0.0	0.0
16-03-2024	4	21.3	73.0	270.0	W	2.9	0.8	0.0	0.0
16-03-2024	5	21.8	70.0	255.0	WSW	4.6	1.3	0.0	0.0
16-03-2024	6	22.5	66.0	45.0	NE	2.2	0.6	0.0	0.0
16-03-2024	7	23.7	63.0	45.0	NE	4.1	1.1	0.0	0.0
16-03-2024	8	25.2	61.0	270.0	W	2.9	0.8	0.0	0.0
16-03-2024	9	27.1	59.0	270.0	W	9.9	2.7	0.0	0.0
16-03-2024	10	28.8	55.0	315.0	NW	12.2	3.4	0.0	0.0
16-03-2024	11	31.3	51.0	315.0	NW	7.9	2.2	0.0	0.0
16-03-2024	12	33.0	50.0	225.0	SW	5.2	1.5	0.0	0.0
16-03-2024	13	34.1	48.0	315.0	NW	2.2	0.6	0.0	0.0
16-03-2024	14	34.8	47.7	315.0	NW	13.3	3.7	0.0	0.0
16-03-2024	15	35.3	47.3	315.0	NW	15.8	4.4	0.0	0.0
16-03-2024	16	35.6	48.0	315.0	NW	7.9	2.2	0.0	0.0
16-03-2024	17	35.4	49.0	315.0	NW	16.6	4.6	0.0	0.0
16-03-2024	18	33.4	50.0	315.0	NW	11.5	3.2	0.0	0.0
16-03-2024	19	31.4	54.0	315.0	NW	15.1	4.2	0.0	0.0
16-03-2024	20	29.7	58.0	65.0	ENE	2.3	0.6	0.0	0.0
16-03-2024	21	27.5	59.0	135.0	SE	1.7	0.5	0.0	0.0
16-03-2024	22	24.8	63.0	270.0	W	0.6	0.2	0.0	0.0
16-03-2024	23	23.4	66.0	270.0	W	1.2	0.3	0.0	0.0
16-03-2024	24	21.7	67.0	255.0	WSW	3.6	1.0	0.0	0.0
17-03-2024	1	21.5	69.0	360.0	N	2.9	0.8	0.0	0.0
17-03-2024	2	21.2	72.0	360.0	N	4.3	1.2	0.0	0.0
17-03-2024	3	21.4	73.0	165.0	SES	0.6	0.2	0.0	0.0
17-03-2024	4	21.8	74.0	166.0	SES	6.1	1.7	0.0	0.0
17-03-2024	5	22.3	75.0	45.0	NE	10.8	3.0	0.0	0.0
17-03-2024	6	23.6	76.0	225.0	SW	3.6	1.0	0.0	0.0
17-03-2024	7	24.8	77.4	225.0	SW	14.4	4.0	0.0	0.0
17-03-2024	8	26.1	75.0	225.0	SW	8.1	2.3	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
17-03-2024	9	27.4	73.5	180.0	S	1.8	0.5	0.0	0.0
17-03-2024	10	28.7	71.0	180.0	S	14.4	4.0	0.0	0.0
17-03-2024	11	29.6	69.5	65.0	ENE	7.9	2.2	0.0	0.0
17-03-2024	12	31.2	67.5	45.0	NE	2.2	0.6	0.0	0.0
17-03-2024	13	31.9	66.5	180.0	S	4.3	1.2	0.0	0.0
17-03-2024	14	32.8	68.8	315.0	NW	14.4	4.0	0.0	0.0
17-03-2024	15	33.5	66.7	315.0	NW	3.6	1.0	0.0	0.0
17-03-2024	16	34.2	64.5	315.0	NW	3.6	1.0	0.0	0.0
17-03-2024	17	34.6	63.3	180.0	S	10.8	3.0	0.0	0.0
17-03-2024	18	32.3	61.4	65.0	ENE	2.2	0.6	0.0	0.0
17-03-2024	19	30.8	58.9	66.0	ENE	3.6	1.0	0.0	0.0
17-03-2024	20	28.7	58.6	327.0	NWN	5.2	1.5	0.0	0.0
17-03-2024	21	26.4	59.0	315.0	NW	2.9	0.8	0.0	0.0
17-03-2024	22	24.3	60.0	225.0	SW	9.4	2.6	0.0	0.0
17-03-2024	23	22.7	62.0	45.0	NE	13.3	3.7	0.0	0.0
17-03-2024	24	21.9	66.0	180.0	S	1.7	0.5	0.0	0.0
18-03-2024	1	21.7	69.0	180.0	S	2.5	0.7	0.0	0.0
18-03-2024	2	21.5	71.5	180.0	S	5.8	1.6	0.0	0.0
18-03-2024	3	21.6	72.0	225.0	SW	1.2	0.3	0.0	0.0
18-03-2024	4	21.9	73.0	180.0	S	2.2	0.6	0.0	0.0
18-03-2024	5	22.4	74.0	315.0	NW	11.9	3.3	0.0	0.0
18-03-2024	6	23.3	74.5	315.0	NW	4.3	1.2	0.0	0.0
18-03-2024	7	24.2	75.0	45.0	NE	15.5	4.3	0.0	0.0
18-03-2024	8	25.6	73.0	121.0	ESE	3.6	1.0	0.0	0.0
18-03-2024	9	27.6	70.0	45.0	NE	8.7	2.4	0.0	0.0
18-03-2024	10	29.1	68.5	270.0	W	8.1	2.3	0.0	0.0
18-03-2024	11	30.7	66.5	245.0	WSW	14.4	4.0	0.0	0.0
18-03-2024	12	31.5	65.0	315.0	NW	2.5	0.7	0.0	0.0
18-03-2024	13	32.8	71.1	315.0	NW	5.8	1.6	0.0	0.0
18-03-2024	14	33.6	67.5	315.0	NW	14.4	4.0	0.0	0.0
18-03-2024	15	34.4	62.6	28.0	NNE	1.8	0.5	0.0	0.0
18-03-2024	16	35.6	58.6	45.0	NE	7.9	2.2	0.0	0.0
18-03-2024	17	36.2	54.4	90.0	E	1.8	0.5	0.0	0.0
18-03-2024	18	34.1	52.3	246.0	WSW	5.2	1.5	0.0	0.0
18-03-2024	19	32.2	55.0	270.0	W	2.3	0.6	0.0	0.0
18-03-2024	20	29.7	58.0	135.0	SE	5.4	1.5	0.0	0.0
18-03-2024	21	27.8	60.0	135.0	SE	2.2	0.6	0.0	0.0
18-03-2024	22	25.4	65.0	360.0	N	0.6	0.2	0.0	0.0
18-03-2024	23	23.3	67.0	115.0	ESE	2.5	0.7	0.0	0.0
18-03-2024	24	21.4	69.0	110.0	ESE	1.5	0.4	0.0	0.0
19-03-2024	1	21.3	69.0	116.0	ESE	2.2	0.6	0.0	0.0
19-03-2024	2	21.1	73.0	120.0	ESE	9.4	2.6	0.0	0.0
19-03-2024	3	21.4	73.0	225.0	SW	1.5	0.4	0.0	0.0
19-03-2024	4	21.8	70.0	270.0	W	5.0	1.4	0.0	0.0
19-03-2024	5	22.6	66.0	115.0	ESE	2.5	0.7	0.0	0.0
19-03-2024	6	23.5	63.0	45.0	NE	5.8	1.6	0.0	0.0
19-03-2024	7	24.6	60.0	135.0	SE	2.5	0.7	0.0	0.0
19-03-2024	8	26.0	59.0	315.0	NW	1.8	0.5	0.0	0.0
19-03-2024	9	27.3	56.0	180.0	S	7.9	2.2	0.0	0.0
19-03-2024	10	28.7	54.0	270.0	W	15.8	4.4	0.0	0.0
19-03-2024	11	29.8	53.0	270.0	W	4.5	1.2	0.0	0.0
19-03-2024	12	31.1	51.0	240.0	WSW	2.0	0.6	0.0	0.0
19-03-2024	13	32.4	49.0	315.0	NW	6.1	1.7	0.0	0.0
19-03-2024	14	33.3	48.4	315.0	NW	13.3	3.7	0.0	0.0
19-03-2024	15	34.4	48.1	315.0	NW	4.5	1.2	0.0	0.0
19-03-2024	16	34.9	47.3	315.0	NW	13.0	3.6	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
19-03-2024	17	35.3	47.6	315.0	NW	6.0	1.7	0.0	0.0
19-03-2024	18	33.5	50.0	135.0	SE	9.5	2.6	0.0	0.0
19-03-2024	19	31.6	51.0	180.0	S	4.3	1.2	0.0	0.0
19-03-2024	20	29.2	55.0	360.0	N	2.5	0.7	0.0	0.0
19-03-2024	21	27.7	59.0	105.0	ESE	2.2	0.6	0.0	0.0
19-03-2024	22	25.1	65.0	155.0	SES	1.5	0.4	0.0	0.0
19-03-2024	23	23.6	67.0	167.0	SES	6.1	1.7	0.0	0.0
19-03-2024	24	22.2	70.0	168.0	SES	3.0	0.8	0.0	0.0
20-03-2024	1	21.9	72.0	195.0	SSW	9.4	2.6	0.0	0.0
20-03-2024	2	21.7	73.5	270.0	W	1.4	0.4	0.0	0.0
20-03-2024	3	22.0	74.0	248.0	WSW	2.2	0.6	0.0	0.0
20-03-2024	4	22.7	74.0	180.0	S	9.0	2.5	0.0	0.0
20-03-2024	5	23.3	72.0	315.0	NW	7.9	2.2	0.0	0.0
20-03-2024	6	24.5	71.5	315.0	NW	5.4	1.5	0.0	0.0
20-03-2024	7	25.7	70.5	135.0	SE	2.5	0.7	0.0	0.0
20-03-2024	8	27.1	69.0	135.0	SE	3.6	1.0	0.0	0.0
20-03-2024	9	28.4	67.5	315.0	NW	1.8	0.5	0.0	0.0
20-03-2024	10	29.7	66.5	270.0	W	2.5	0.7	0.0	0.0
20-03-2024	11	31.1	71.6	315.0	NW	6.0	1.7	0.0	0.0
20-03-2024	12	32.6	69.3	315.0	NW	2.2	0.6	0.0	0.0
20-03-2024	13	34.1	66.5	315.0	NW	5.4	1.5	0.0	0.0
20-03-2024	14	35.2	62.6	315.0	NW	5.5	1.5	0.0	0.0
20-03-2024	15	35.9	59.6	315.0	NW	2.2	0.6	0.0	0.0
20-03-2024	16	36.7	56.4	315.0	NW	5.5	1.5	0.0	0.0
20-03-2024	17	36.2	53.7	238.0	WSW	9.4	2.6	0.0	0.0
20-03-2024	18	35.1	52.0	135.0	SE	4.3	1.2	0.0	0.0
20-03-2024	19	33.5	53.0	135.0	SE	2.0	0.6	0.0	0.0
20-03-2024	20	31.4	57.0	31.0	NNE	3.0	0.8	0.0	0.0
20-03-2024	21	29.3	61.0	135.0	SE	9.4	2.6	0.0	0.0
20-03-2024	22	27.2	63.0	135.0	SE	1.5	0.4	0.0	0.0
20-03-2024	23	24.6	64.0	135.0	SE	5.0	1.4	0.0	0.0
20-03-2024	24	23.1	67.0	135.0	SE	2.5	0.7	0.0	0.0
21-03-2024	1	22.7	70.0	270.0	W	1.4	0.4	0.0	0.0
21-03-2024	2	22.6	71.5	270.0	W	2.0	0.6	0.0	0.0
21-03-2024	3	22.8	70.5	301.0	WNW	6.1	1.7	0.0	0.0
21-03-2024	4	23.4	69.5	135.0	SE	1.8	0.5	0.0	0.0
21-03-2024	5	24.3	67.5	135.0	SE	4.7	1.3	0.0	0.0
21-03-2024	6	24.9	70.5	242.0	WSW	3.6	1.0	0.0	0.0
21-03-2024	7	26.2	71.0	180.0	S	8.6	2.4	0.0	0.0
21-03-2024	8	27.5	72.0	180.0	S	2.5	0.7	0.0	0.0
21-03-2024	9	28.9	73.0	315.0	NW	1.8	0.5	0.0	0.0
21-03-2024	10	30.2	73.4	180.0	S	9.7	2.7	0.0	0.0
21-03-2024	11	31.5	71.2	45.0	NE	4.0	1.1	0.0	0.0
21-03-2024	12	32.8	68.8	315.0	NW	3.0	0.8	0.0	0.0
21-03-2024	13	33.9	66.7	315.0	NW	5.5	1.5	0.0	0.0
21-03-2024	14	34.7	64.1	315.0	NW	10.4	2.9	0.0	0.0
21-03-2024	15	35.6	63.6	315.0	NW	9.0	2.5	0.0	0.0
21-03-2024	16	36.2	62.4	315.0	NW	3.6	1.0	0.0	0.0
21-03-2024	17	36.6	61.7	315.0	NW	5.5	1.5	0.0	0.0
21-03-2024	18	34.2	60.8	360.0	N	12.6	3.5	0.0	0.0
21-03-2024	19	32.3	58.8	90.0	E	4.0	1.1	0.0	0.0
21-03-2024	20	30.1	57.4	135.0	SE	3.0	0.8	0.0	0.0
21-03-2024	21	28.3	57.0	135.0	SE	13.0	3.6	0.0	0.0
21-03-2024	22	25.1	61.0	135.0	SE	2.5	0.7	0.0	0.0
21-03-2024	23	23.4	67.0	135.0	SE	8.3	2.3	0.0	0.0
21-03-2024	24	22.2	70.0	135.0	SE	1.0	0.3	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
22-03-2024	1	22.0	71.2	289.0	WNW	2.5	0.7	0.0	0.0
22-03-2024	2	21.7	70.4	45.0	NE	10.8	3.0	0.0	0.0
22-03-2024	3	21.1	69.0	225.0	SW	2.0	0.6	0.0	0.0
22-03-2024	4	20.7	68.0	45.0	NE	4.0	1.1	0.0	0.0
22-03-2024	5	20.6	68.0	45.0	NE	1.8	0.5	0.0	0.0
22-03-2024	6	22.2	66.0	315.0	NW	2.5	0.7	0.0	0.0
22-03-2024	7	23.9	64.0	180.0	S	12.6	3.5	0.0	0.0
22-03-2024	8	26.4	62.0	45.0	NE	9.4	2.6	0.0	0.0
22-03-2024	9	28.1	57.0	225.0	SW	2.0	0.6	0.0	0.0
22-03-2024	10	29.7	55.0	45.0	NE	3.6	1.0	0.0	0.0
22-03-2024	11	30.8	54.3	315.0	NW	9.5	2.6	0.0	0.0
22-03-2024	12	32.3	53.1	315.0	NW	12.6	3.5	0.0	0.0
22-03-2024	13	33.9	51.7	315.0	NW	16.2	4.5	0.0	0.0
22-03-2024	14	35.0	51.2	315.0	NW	6.0	1.7	0.0	0.0
22-03-2024	15	36.1	49.7	315.0	NW	20.5	5.7	0.0	0.0
22-03-2024	16	36.7	48.6	315.0	NW	5.5	1.5	0.0	0.0
22-03-2024	17	36.3	49.6	315.0	NW	18.7	5.2	0.0	0.0
22-03-2024	18	35.1	52.1	135.0	SE	4.0	1.1	0.0	0.0
22-03-2024	19	33.2	53.0	315.0	NW	13.3	3.7	0.0	0.0
22-03-2024	20	31.3	54.0	135.0	SE	2.0	0.6	0.0	0.0
22-03-2024	21	28.8	58.0	135.0	SE	1.0	0.3	0.0	0.0
22-03-2024	22	26.4	59.0	166.0	SES	1.0	0.3	0.0	0.0
22-03-2024	23	24.3	60.0	286.0	WNW	9.7	2.7	0.0	0.0
22-03-2024	24	23.1	63.0	245.0	WSW	1.0	0.3	0.0	0.0
23-03-2024	1	22.7	66.0	246.0	WSW	2.9	0.8	0.0	0.0
23-03-2024	2	22.6	66.0	248.0	WSW	2.5	0.7	0.0	0.0
23-03-2024	3	22.5	70.0	249.0	WSW	9.7	2.7	0.0	0.0
23-03-2024	4	22.9	67.0	251.0	WSW	6.1	1.7	0.0	0.0
23-03-2024	5	23.7	67.0	45.0	NE	3.6	1.0	0.0	0.0
23-03-2024	6	24.3	64.0	180.0	S	2.5	0.7	0.0	0.0
23-03-2024	7	25.2	61.0	135.0	SE	4.0	1.1	0.0	0.0
23-03-2024	8	26.6	59.0	135.0	SE	2.5	0.7	0.0	0.0
23-03-2024	9	28.3	57.0	315.0	NW	4.5	1.2	0.0	0.0
23-03-2024	10	30.1	56.0	315.0	NW	12.2	3.4	0.0	0.0
23-03-2024	11	30.9	54.0	315.0	NW	5.0	1.4	0.0	0.0
23-03-2024	12	32.1	53.2	315.0	NW	2.2	0.6	0.0	0.0
23-03-2024	13	34.9	52.0	315.0	NW	7.9	2.2	0.0	0.0
23-03-2024	14	35.7	50.6	315.0	NW	16.2	4.5	0.0	0.0
23-03-2024	15	36.5	49.4	270.0	W	20.5	5.7	0.0	0.0
23-03-2024	16	36.7	47.9	270.0	W	9.0	2.5	0.0	0.0
23-03-2024	17	36.0	49.0	270.0	W	18.7	5.2	0.0	0.0
23-03-2024	18	35.3	47.6	180.0	S	13.3	3.7	0.0	0.0
23-03-2024	19	32.1	48.3	289.0	WNW	11.9	3.3	0.0	0.0
23-03-2024	20	29.8	50.0	135.0	SE	1.0	0.3	0.0	0.0
23-03-2024	21	27.6	53.0	360.0	N	5.5	1.5	0.0	0.0
23-03-2024	22	25.6	58.0	120.0	ESE	13.3	3.7	0.0	0.0
23-03-2024	23	24.0	62.4	225.0	SW	1.5	0.4	0.0	0.0
23-03-2024	24	22.7	64.7	315.0	NW	1.8	0.5	0.0	0.0
24-03-2024	1	22.5	68.2	315.0	NW	4.0	1.1	0.0	0.0
24-03-2024	2	22.2	71.2	315.0	NW	6.1	1.7	0.0	0.0
24-03-2024	3	21.6	73.0	315.0	NW	1.0	0.3	0.0	0.0
24-03-2024	4	21.0	72.5	122.0	ESE	2.0	0.6	0.0	0.0
24-03-2024	5	21.2	71.5	225.0	SW	13.0	3.6	0.0	0.0
24-03-2024	6	22.9	72.0	180.0	S	3.5	1.0	0.0	0.0
24-03-2024	7	24.6	73.0	315.0	NW	9.0	2.5	0.0	0.0
24-03-2024	8	26.5	74.0	225.0	SW	2.0	0.6	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
24-03-2024	9	28.3	71.0	225.0	SW	5.4	1.5	0.0	0.0
24-03-2024	10	29.7	69.0	315.0	NW	13.0	3.6	0.0	0.0
24-03-2024	11	31.1	66.5	315.0	NW	14.0	3.9	0.0	0.0
24-03-2024	12	32.8	65.0	315.0	NW	13.0	3.6	0.0	0.0
24-03-2024	13	34.3	67.0	315.0	NW	10.8	3.0	0.0	0.0
24-03-2024	14	35.5	68.6	315.0	NW	4.5	1.3	0.0	0.0
24-03-2024	15	36.5	65.6	315.0	NW	15.1	4.2	0.0	0.0
24-03-2024	16	36.7	62.3	315.0	NW	7.9	2.2	0.0	0.0
24-03-2024	17	36.2	59.6	315.0	NW	7.9	2.2	0.0	0.0
24-03-2024	18	35.0	57.4	315.0	NW	13.3	3.7	0.0	0.0
24-03-2024	19	34.1	54.4	315.0	NW	7.9	2.2	0.0	0.0
24-03-2024	20	32.4	53.6	315.0	NW	13.3	3.7	0.0	0.0
24-03-2024	21	31.0	57.0	315.0	NW	7.9	2.2	0.0	0.0
24-03-2024	22	28.6	60.0	285.0	WNW	1.1	0.3	0.0	0.0
24-03-2024	23	25.7	65.0	315.0	NW	3.0	0.8	0.0	0.0
24-03-2024	24	23.4	67.0	285.0	WNW	5.8	1.6	0.0	0.0
25-03-2024	1	23.2	67.0	135.0	SE	9.0	2.5	0.0	0.0
25-03-2024	2	22.7	70.0	225.0	SW	12.6	3.5	0.0	0.0
25-03-2024	3	22.5	70.0	333.0	NWN	3.6	1.0	0.0	0.0
25-03-2024	4	22.6	66.0	345.0	NWN	8.3	2.3	0.0	0.0
25-03-2024	5	23.3	63.0	135.0	SE	9.4	2.6	0.0	0.0
25-03-2024	6	24.5	60.0	270.0	W	2.5	0.7	0.0	0.0
25-03-2024	7	25.7	58.0	112.0	ESE	2.0	0.6	0.0	0.0
25-03-2024	8	27.1	56.0	116.0	ESE	3.6	1.0	0.0	0.0
25-03-2024	9	28.4	54.0	180.0	S	3.6	1.0	0.0	0.0
25-03-2024	10	29.6	52.0	315.0	NW	10.8	3.0	0.0	0.0
25-03-2024	11	31.1	53.0	315.0	NW	14.4	4.0	0.0	0.0
25-03-2024	12	32.4	49.0	45.0	NE	7.9	2.2	0.0	0.0
25-03-2024	13	34.0	48.0	315.0	NW	10.8	3.0	0.0	0.0
25-03-2024	14	34.4	47.7	180.0	S	15.1	4.2	0.0	0.0
25-03-2024	15	36.2	48.0	315.0	NW	13.7	3.8	0.0	0.0
25-03-2024	16	36.7	47.6	315.0	NW	15.1	4.2	0.0	0.0
25-03-2024	17	36.1	47.8	285.0	WNW	15.1	4.2	0.0	0.0
25-03-2024	18	35.6	48.9	315.0	NW	14.4	4.0	0.0	0.0
25-03-2024	19	34.3	52.3	90.0	E	3.6	1.0	0.0	0.0
25-03-2024	20	32.2	55.0	300.0	WNW	10.8	3.0	0.0	0.0
25-03-2024	21	30.3	59.0	180.0	S	1.0	0.3	0.0	0.0
25-03-2024	22	28.0	64.0	180.0	S	1.0	0.3	0.0	0.0
25-03-2024	23	26.0	66.0	180.0	S	1.8	0.5	0.0	0.0
25-03-2024	24	23.7	67.0	65.0	ENE	3.6	1.0	0.0	0.0
26-03-2024	1	22.8	67.0	75.0	ENE	3.6	1.0	0.0	0.0
26-03-2024	2	22.5	66.0	115.0	ESE	3.6	1.0	0.0	0.0
26-03-2024	3	22.3	66.0	360.0	N	3.0	0.8	0.0	0.0
26-03-2024	4	22.1	70.0	360.0	N	1.0	0.3	0.0	0.0
26-03-2024	5	22.0	70.0	315.0	NW	3.0	0.8	0.0	0.0
26-03-2024	6	23.4	71.0	315.0	NW	3.2	0.9	0.0	0.0
26-03-2024	7	25.2	68.0	25.0	NNE	1.8	0.5	0.0	0.0
26-03-2024	8	27.3	66.0	360.0	N	3.6	1.0	0.0	0.0
26-03-2024	9	29.4	64.0	116.0	ESE	8.3	2.3	0.0	0.0
26-03-2024	10	30.5	65.0	166.0	SES	10.8	3.0	0.0	0.0
26-03-2024	11	31.8	64.0	59.0	ENE	9.5	2.6	0.0	0.0
26-03-2024	12	32.6	61.0	315.0	NW	1.8	0.5	0.0	0.0
26-03-2024	13	33.7	56.0	315.0	NW	14.4	4.0	0.0	0.0
26-03-2024	14	35.1	55.0	315.0	NW	7.9	2.2	0.0	0.0
26-03-2024	15	36.2	53.0	315.0	NW	15.5	4.3	0.0	0.0
26-03-2024	16	36.7	51.0	270.0	W	10.5	2.9	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
26-03-2024	17	36.3	50.5	180.0	S	13.9	3.9	0.0	0.0
26-03-2024	18	35.2	51.0	225.0	SW	3.6	1.0	0.0	0.0
26-03-2024	19	34.7	54.0	90.0	E	3.6	1.0	0.0	0.0
26-03-2024	20	32.1	58.0	148.0	SES	2.0	0.6	0.0	0.0
26-03-2024	21	30.7	62.0	159.0	SES	1.0	0.3	0.0	0.0
26-03-2024	22	28.9	68.0	135.0	SE	5.5	1.5	0.0	0.0
26-03-2024	23	27.1	70.0	115.0	ESE	8.5	2.4	0.0	0.0
26-03-2024	24	25.1	72.0	270.0	W	2.0	0.6	0.0	0.0
27-03-2024	1	24.7	73.4	270.0	W	13.0	3.6	0.0	0.0
27-03-2024	2	23.2	74.4	245.0	WSW	1.8	0.5	0.0	0.0
27-03-2024	3	23.0	75.0	315.0	NW	1.0	0.3	0.0	0.0
27-03-2024	4	22.4	74.0	315.0	NW	12.2	3.4	0.0	0.0
27-03-2024	5	22.5	73.0	315.0	NW	2.5	0.7	0.0	0.0
27-03-2024	6	23.9	72.0	180.0	S	8.6	2.4	0.0	0.0
27-03-2024	7	25.5	69.3	298.0	WNW	4.5	1.2	0.0	0.0
27-03-2024	8	27.6	67.5	315.0	NW	5.5	1.5	0.0	0.0
27-03-2024	9	28.9	65.5	315.0	NW	7.9	2.2	0.0	0.0
27-03-2024	10	29.9	64.0	270.0	W	7.9	2.2	0.0	0.0
27-03-2024	11	31.3	63.0	90.0	E	10.8	3.0	0.0	0.0
27-03-2024	12	33.1	69.3	45.0	NE	3.2	0.9	0.0	0.0
27-03-2024	13	34.1	66.6	315.0	NW	12.6	3.5	0.0	0.0
27-03-2024	14	35.0	63.4	315.0	NW	15.8	4.4	0.0	0.0
27-03-2024	15	35.4	61.2	180.0	S	2.2	0.6	0.0	0.0
27-03-2024	16	36.4	58.7	45.0	NE	13.7	3.8	0.0	0.0
27-03-2024	17	36.7	56.5	315.0	NW	10.9	3.0	0.0	0.0
27-03-2024	18	35.4	53.7	180.0	S	5.0	1.4	0.0	0.0
27-03-2024	19	33.6	53.0	315.0	NW	2.5	0.7	0.0	0.0
27-03-2024	20	31.4	57.0	315.0	NW	14.4	4.0	0.0	0.0
27-03-2024	21	29.3	60.0	45.0	NE	2.2	0.6	0.0	0.0
27-03-2024	22	27.3	66.0	328.0	NWN	3.6	1.0	0.0	0.0
27-03-2024	23	24.8	68.0	315.0	NW	10.8	3.0	0.0	0.0
27-03-2024	24	23.9	71.0	315.0	NW	4.3	1.2	0.0	0.0
28-03-2024	1	23.5	72.0	315.0	NW	3.2	0.9	0.0	0.0
28-03-2024	2	23.1	74.3	315.0	NW	10.8	3.0	0.0	0.0
28-03-2024	3	22.9	72.6	315.0	NW	8.6	2.4	0.0	0.0
28-03-2024	4	22.4	71.0	225.0	SW	2.2	0.6	0.0	0.0
28-03-2024	5	22.5	68.6	45.0	NE	5.5	1.5	0.0	0.0
28-03-2024	6	24.1	66.5	45.0	NE	5.0	1.4	0.0	0.0
28-03-2024	7	25.9	65.0	210.0	SSW	2.5	0.7	0.0	0.0
28-03-2024	8	28.1	64.0	135.0	SE	9.7	2.7	0.0	0.0
28-03-2024	9	29.4	63.5	90.0	E	1.8	0.5	0.0	0.0
28-03-2024	10	30.2	62.0	45.0	NE	10.8	3.0	0.0	0.0
28-03-2024	11	31.6	61.0	315.0	NW	3.0	0.8	0.0	0.0
28-03-2024	12	32.5	64.0	135.0	SE	8.6	2.4	0.0	0.0
28-03-2024	13	34.1	68.2	315.0	NW	1.8	0.5	0.0	0.0
28-03-2024	14	35.4	63.4	180.0	S	10.8	3.0	0.0	0.0
28-03-2024	15	36.3	59.6	315.0	NW	5.5	1.5	0.0	0.0
28-03-2024	16	36.5	56.3	315.0	NW	9.5	2.6	0.0	0.0
28-03-2024	17	35.2	53.2	315.0	NW	14.4	4.0	0.0	0.0
28-03-2024	18	33.7	50.6	256.0	WSW	2.9	0.8	0.0	0.0
28-03-2024	19	32.1	49.4	346.0	NWN	14.4	4.0	0.0	0.0
28-03-2024	20	30.4	51.0	135.0	SE	10.8	3.0	0.0	0.0
28-03-2024	21	28.6	53.3	135.0	SE	13.7	3.8	0.0	0.0
28-03-2024	22	27.2	59.0	135.0	SE	14.4	4.0	0.0	0.0
28-03-2024	23	25.1	61.0	270.0	W	10.8	3.0	0.0	0.0
28-03-2024	24	23.3	64.0	135.0	SE	3.6	1.0	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
29-03-2024	1	21.4	67.0	135.0	SE	4.0	1.1	0.0	0.0
29-03-2024	2	20.2	67.0	329.0	NWN	2.0	0.6	0.0	0.0
29-03-2024	3	19.4	71.0	135.0	SE	1.0	0.3	0.0	0.0
29-03-2024	4	18.8	71.0	346.0	NWN	1.0	0.3	0.0	0.0
29-03-2024	5	18.3	68.0	315.0	NW	9.0	2.5	0.0	0.0
29-03-2024	6	19.4	65.0	45.0	NE	2.9	0.8	0.0	0.0
29-03-2024	7	21.6	62.0	165.0	SES	5.5	1.5	0.0	0.0
29-03-2024	8	23.4	60.0	45.0	NE	3.6	1.0	0.0	0.0
29-03-2024	9	25.5	58.0	315.0	NW	2.2	0.6	0.0	0.0
29-03-2024	10	27.1	57.0	315.0	NW	3.6	1.0	0.0	0.0
29-03-2024	11	28.2	55.0	315.0	NW	3.6	1.0	0.0	0.0
29-03-2024	12	29.6	54.0	315.0	NW	10.8	3.0	0.0	0.0
29-03-2024	13	31.3	53.0	315.0	NW	5.0	1.4	0.0	0.0
29-03-2024	14	32.4	51.7	315.0	NW	7.9	2.2	0.0	0.0
29-03-2024	15	34.2	51.4	315.0	NW	5.0	1.4	0.0	0.0
29-03-2024	16	35.6	50.7	285.0	WNW	10.8	3.0	0.0	0.0
29-03-2024	17	36.2	49.9	295.0	WNW	14.4	4.0	0.0	0.0
29-03-2024	18	35.3	52.0	135.0	SE	13.7	3.8	0.0	0.0
29-03-2024	19	33.4	55.0	135.0	SE	10.8	3.0	0.0	0.0
29-03-2024	20	31.2	59.0	135.0	SE	1.5	0.4	0.0	0.0
29-03-2024	21	29.7	63.0	135.0	SE	2.0	0.6	0.0	0.0
29-03-2024	22	27.2	64.0	135.0	SE	1.0	0.3	0.0	0.0
29-03-2024	23	25.1	66.0	135.0	SE	12.6	3.5	0.0	0.0
29-03-2024	24	23.2	68.0	135.0	SE	10.8	3.0	0.0	0.0
30-03-2024	1	21.3	69.0	45.0	NE	7.9	2.2	0.0	0.0
30-03-2024	2	19.9	70.0	165.0	SES	5.8	1.6	0.0	0.0
30-03-2024	3	19.1	71.0	148.0	SES	2.5	0.7	0.0	0.0
30-03-2024	4	18.4	72.0	270.0	W	1.0	0.3	0.0	0.0
30-03-2024	5	17.6	74.0	315.0	NW	8.0	2.2	0.0	0.0
30-03-2024	6	19.1	75.0	315.0	NW	7.9	2.2	0.0	0.0
30-03-2024	7	20.2	73.0	315.0	NW	11.9	3.3	0.0	0.0
30-03-2024	8	23.2	70.0	135.0	SE	12.6	3.5	0.0	0.0
30-03-2024	9	24.4	64.0	315.0	NW	5.5	1.5	0.0	0.0
30-03-2024	10	26.1	63.0	270.0	W	3.6	1.0	0.0	0.0
30-03-2024	11	28.2	64.0	270.0	W	3.6	1.0	0.0	0.0
30-03-2024	12	29.4	59.0	270.0	W	9.0	2.5	0.0	0.0
30-03-2024	13	31.4	55.0	315.0	NW	3.6	1.0	0.0	0.0
30-03-2024	14	33.4	50.0	315.0	NW	3.6	1.0	0.0	0.0
30-03-2024	15	34.5	50.0	315.0	NW	3.6	1.0	0.0	0.0
30-03-2024	16	36.2	49.0	270.0	W	9.0	2.5	0.0	0.0
30-03-2024	17	35.2	49.0	242.0	WSW	6.0	1.7	0.0	0.0
30-03-2024	18	33.2	49.0	270.0	W	15.8	4.4	0.0	0.0
30-03-2024	19	31.2	52.0	315.0	NW	9.0	2.5	0.0	0.0
30-03-2024	20	28.8	53.0	289.0	WNW	9.4	2.6	0.0	0.0
30-03-2024	21	27.4	54.0	135.0	SE	9.0	2.5	0.0	0.0
30-03-2024	22	26.2	54.0	135.0	SE	4.0	1.1	0.0	0.0
30-03-2024	23	24.6	59.0	135.0	SE	2.5	0.7	0.0	0.0
30-03-2024	24	23.3	62.4	135.0	SE	1.0	0.3	0.0	0.0
31-03-2024	1	21.4	64.2	135.0	SE	2.5	0.7	0.0	0.0
31-03-2024	2	20.1	66.2	135.0	SE	1.5	0.4	0.0	0.0
31-03-2024	3	19.2	68.2	135.0	SE	2.2	0.6	0.0	0.0
31-03-2024	4	18.2	69.6	135.0	SE	9.4	2.6	0.0	0.0
31-03-2024	5	17.4	71.1	19.0	NNE	12.6	3.5	0.0	0.0
31-03-2024	6	17.1	72.6	25.0	NNE	13.3	3.7	0.0	0.0
31-03-2024	7	18.5	74.2	135.0	SE	15.5	4.3	0.0	0.0
31-03-2024	8	21.1	75.0	156.0	SES	16.9	4.7	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
31-03-2024	9	23.2	73.5	45.0	NE	2.2	0.6	0.0	0.0
31-03-2024	10	25.5	71.0	270.0	W	8.0	2.2	0.0	0.0
31-03-2024	11	27.2	69.5	270.0	W	13.3	3.7	0.0	0.0
31-03-2024	12	29.4	67.5	245.0	WSW	9.0	2.5	0.0	0.0
31-03-2024	13	31.7	65.5	315.0	NW	7.0	1.9	0.0	0.0
31-03-2024	14	33.4	63.0	315.0	NW	2.2	0.6	0.0	0.0
31-03-2024	15	35.2	64.0	315.0	NW	10.8	3.0	0.0	0.0
31-03-2024	16	36.7	67.7	315.0	NW	7.9	2.2	0.0	0.0
31-03-2024	17	36.9	64.4	315.0	NW	14.4	4.0	0.0	0.0
31-03-2024	18	34.6	62.3	315.0	NW	16.6	4.6	0.0	0.0
31-03-2024	19	33.2	61.0	315.0	NW	15.5	4.3	0.0	0.0
31-03-2024	20	32.0	60.6	315.0	NW	14.4	4.0	0.0	0.0
31-03-2024	21	30.6	62.4	315.0	NW	13.3	3.7	0.0	0.0
31-03-2024	22	29.9	66.5	315.0	NW	12.6	3.5	0.0	0.0
31-03-2024	23	28.4	68.8	225.0	SW	1.5	0.4	0.0	0.0
31-03-2024	24	26.6	69.5	315.0	NW	9.0	2.5	0.0	0.0
01-04-2024	1	25.1	70.4	315.0	NW	9.4	2.6	0.0	0.0
01-04-2024	2	23.6	71.0	315.0	NW	9.0	2.5	0.0	0.0
01-04-2024	3	22.4	72.5	315.0	NW	10.8	3.0	0.0	0.0
01-04-2024	4	22.2	73.0	315.0	NW	12.6	3.5	0.0	0.0
01-04-2024	5	23.1	73.5	135.0	SE	9.4	2.6	0.0	0.0
01-04-2024	6	24.4	71.0	135.0	SE	5.4	1.5	0.0	0.0
01-04-2024	7	26.1	69.5	135.0	SE	7.9	2.2	0.0	0.0
01-04-2024	8	27.7	67.5	135.0	SE	8.6	2.4	0.0	0.0
01-04-2024	9	29.4	65.5	315.0	NW	3.6	1.0	0.0	0.0
01-04-2024	10	31.1	64.4	315.0	NW	9.9	2.7	0.0	0.0
01-04-2024	11	32.2	63.0	315.0	NW	11.9	3.3	0.0	0.0
01-04-2024	12	33.7	62.5	315.0	NW	14.4	4.0	0.0	0.0
01-04-2024	13	35.1	68.6	315.0	NW	14.4	4.0	0.0	0.0
01-04-2024	14	36.2	64.9	315.0	NW	15.1	4.2	0.0	0.0
01-04-2024	15	37.3	62.1	315.0	NW	15.5	4.3	0.0	0.0
01-04-2024	16	38.3	58.6	315.0	NW	13.3	3.7	0.0	0.0
01-04-2024	17	38.2	55.4	315.0	NW	12.2	3.4	0.0	0.0
01-04-2024	18	37.7	53.2	240.0	WSW	15.1	4.2	0.0	0.0
01-04-2024	19	34.6	51.0	245.0	WSW	9.7	2.7	0.0	0.0
01-04-2024	20	31.3	55.0	315.0	NW	8.3	2.3	0.0	0.0
01-04-2024	21	28.6	58.0	255.0	WSW	7.2	2.0	0.0	0.0
01-04-2024	22	26.4	63.0	135.0	SE	10.8	3.0	0.0	0.0
01-04-2024	23	24.4	65.0	135.0	SE	1.2	0.3	0.0	0.0
01-04-2024	24	22.7	67.0	135.0	SE	10.8	3.0	0.0	0.0
02-04-2024	1	22.1	69.0	135.0	SE	14.4	4.0	0.0	0.0
02-04-2024	2	21.7	71.0	25.0	NNE	1.8	0.5	0.0	0.0
02-04-2024	3	21.2	71.0	31.0	NNE	14.4	4.0	0.0	0.0
02-04-2024	4	20.7	71.0	16.0	NNE	4.3	1.2	0.0	0.0
02-04-2024	5	20.9	67.0	15.0	NNE	10.8	3.0	0.0	0.0
02-04-2024	6	22.2	65.0	180.0	S	3.7	1.0	0.0	0.0
02-04-2024	7	23.4	62.0	165.0	SES	10.8	3.0	0.0	0.0
02-04-2024	8	25.2	60.0	45.0	NE	15.5	4.3	0.0	0.0
02-04-2024	9	26.9	56.0	45.0	NE	12.2	3.4	0.0	0.0
02-04-2024	10	28.4	54.0	45.0	NE	10.8	3.0	0.0	0.0
02-04-2024	11	30.3	52.0	210.0	SSW	12.2	3.4	0.0	0.0
02-04-2024	12	31.6	50.0	270.0	W	13.3	3.7	0.0	0.0
02-04-2024	13	33.0	48.0	255.0	WSW	15.1	4.2	0.0	0.0
02-04-2024	14	34.6	48.0	315.0	NW	16.2	4.5	0.0	0.0
02-04-2024	15	36.2	48.0	315.0	NW	7.9	2.2	0.0	0.0
02-04-2024	16	37.2	49.0	315.0	NW	13.3	3.7	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
02-04-2024	17	37.0	49.0	315.0	NW	15.1	4.2	0.0	0.0
02-04-2024	18	35.6	53.0	330.0	NWN	14.4	4.0	0.0	0.0
02-04-2024	19	33.3	55.0	340.0	NWN	13.0	3.6	0.0	0.0
02-04-2024	20	32.1	58.0	345.0	NWN	16.9	4.7	0.0	0.0
02-04-2024	21	31.1	63.0	135.0	SE	9.7	2.7	0.0	0.0
02-04-2024	22	28.8	64.0	135.0	SE	4.9	1.4	0.0	0.0
02-04-2024	23	27.5	66.0	135.0	SE	1.2	0.3	0.0	0.0
02-04-2024	24	26.7	69.0	135.0	SE	1.9	0.5	0.0	0.0
03-04-2024	1	26.4	69.0	135.0	SE	4.9	1.4	0.0	0.0
03-04-2024	2	26.2	73.0	135.0	SE	4.9	1.4	0.0	0.0
03-04-2024	3	26.3	73.0	15.0	NNE	10.8	3.0	0.0	0.0
03-04-2024	4	26.8	75.0	180.0	S	14.4	4.0	0.0	0.0
03-04-2024	5	27.5	76.0	180.0	S	1.9	0.5	0.0	0.0
03-04-2024	6	28.2	77.4	225.0	SW	10.8	3.0	0.0	0.0
03-04-2024	7	28.9	77.7	155.0	SES	14.4	4.0	0.0	0.0
03-04-2024	8	30.1	78.9	165.0	SES	1.9	0.5	0.0	0.0
03-04-2024	9	30.7	79.2	45.0	NE	4.3	1.2	0.0	0.0
03-04-2024	10	31.4	77.6	270.0	W	4.3	1.2	0.0	0.0
03-04-2024	11	33.0	74.4	315.0	NW	9.0	2.5	0.0	0.0
03-04-2024	12	34.3	71.3	315.0	NW	8.3	2.3	0.0	0.0
03-04-2024	13	35.6	68.6	315.0	NW	12.6	3.5	0.0	0.0
03-04-2024	14	36.4	65.2	315.0	NW	14.4	4.0	0.0	0.0
03-04-2024	15	36.9	62.3	315.0	NW	16.6	4.6	0.0	0.0
03-04-2024	16	37.0	58.6	315.0	NW	15.8	4.4	0.0	0.0
03-04-2024	17	37.3	55.4	180.0	S	19.4	5.4	0.0	0.0
03-04-2024	18	37.0	52.2	135.0	SE	13.7	3.8	0.0	0.0
03-04-2024	19	35.2	53.4	45.0	NE	15.5	4.3	0.0	0.0
03-04-2024	20	33.0	55.8	333.0	NWN	13.7	3.8	0.0	0.0
03-04-2024	21	30.9	58.5	135.0	SE	15.1	4.2	0.0	0.0
03-04-2024	22	28.7	60.0	135.0	SE	7.9	2.2	0.0	0.0
03-04-2024	23	27.3	63.0	135.0	SE	2.5	0.7	0.0	0.0
03-04-2024	24	25.4	65.0	25.0	NNE	14.4	4.0	0.0	0.0
04-04-2024	1	25.0	68.0	180.0	S	10.8	3.0	0.0	0.0
04-04-2024	2	24.3	71.0	180.0	S	3.6	1.0	0.0	0.0
04-04-2024	3	24.0	71.0	180.0	S	3.6	1.0	0.0	0.0
04-04-2024	4	23.6	71.0	112.0	ESE	3.7	1.0	0.0	0.0
04-04-2024	5	24.5	68.0	360.0	N	13.3	3.7	0.0	0.0
04-04-2024	6	26.4	66.0	225.0	SW	15.8	4.4	0.0	0.0
04-04-2024	7	27.6	59.0	155.0	SES	7.9	2.2	0.0	0.0
04-04-2024	8	28.7	55.0	158.0	SES	14.4	4.0	0.0	0.0
04-04-2024	9	29.9	53.0	45.0	NE	8.6	2.4	0.0	0.0
04-04-2024	10	30.7	52.0	270.0	W	15.1	4.2	0.0	0.0
04-04-2024	11	32.8	50.0	270.0	W	13.3	3.7	0.0	0.0
04-04-2024	12	34.6	48.0	270.0	W	15.5	4.3	0.0	0.0
04-04-2024	13	36.1	48.0	245.0	WSW	18.7	5.2	0.0	0.0
04-04-2024	14	36.7	48.0	315.0	NW	16.9	4.7	0.0	0.0
04-04-2024	15	37.9	47.0	315.0	NW	15.5	4.3	0.0	0.0
04-04-2024	16	38.2	46.0	315.0	NW	15.8	4.4	0.0	0.0
04-04-2024	17	38.1	47.0	315.0	NW	15.1	4.2	0.0	0.0
04-04-2024	18	37.3	49.0	315.0	NW	13.7	3.8	0.0	0.0
04-04-2024	19	35.6	52.0	135.0	SE	13.0	3.6	0.0	0.0
04-04-2024	20	33.2	56.0	135.0	SE	10.8	3.0	0.0	0.0
04-04-2024	21	31.2	60.0	135.0	SE	1.9	0.5	0.0	0.0
04-04-2024	22	29.1	64.0	335.0	NWN	5.6	1.5	0.0	0.0
04-04-2024	23	27.8	67.0	340.0	NWN	12.6	3.5	0.0	0.0
04-04-2024	24	26.6	69.0	135.0	SE	15.1	4.2	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
05-04-2024	1	26.2	69.0	135.0	SE	14.4	4.0	0.0	0.0
05-04-2024	2	25.9	73.0	15.0	NNE	9.3	2.6	0.0	0.0
05-04-2024	3	26.0	73.0	26.0	NNE	1.9	0.5	0.0	0.0
05-04-2024	4	26.7	73.0	180.0	S	10.8	3.0	0.0	0.0
05-04-2024	5	27.4	70.0	135.0	SE	1.9	0.5	0.0	0.0
05-04-2024	6	28.2	67.0	303.0	WNW	4.3	1.2	0.0	0.0
05-04-2024	7	29.0	64.0	135.0	SE	7.2	2.0	0.0	0.0
05-04-2024	8	29.7	64.0	270.0	W	10.4	2.9	0.0	0.0
05-04-2024	9	31.1	60.0	315.0	NW	14.4	4.0	0.0	0.0
05-04-2024	10	32.0	58.0	315.0	NW	13.0	3.6	0.0	0.0
05-04-2024	11	33.0	56.0	315.0	NW	12.6	3.5	0.0	0.0
05-04-2024	12	34.2	54.0	270.0	W	8.6	2.4	0.0	0.0
05-04-2024	13	35.8	50.0	315.0	NW	14.4	4.0	0.0	0.0
05-04-2024	14	36.5	50.0	315.0	NW	13.7	3.8	0.0	0.0
05-04-2024	15	37.4	49.0	315.0	NW	11.9	3.3	0.0	0.0
05-04-2024	16	38.0	50.0	315.0	NW	14.4	4.0	0.0	0.0
05-04-2024	17	38.1	50.0	315.0	NW	16.9	4.7	0.0	0.0
05-04-2024	18	36.6	53.0	135.0	SE	8.3	2.3	0.0	0.0
05-04-2024	19	34.3	54.0	135.0	SE	13.3	3.7	0.0	0.0
05-04-2024	20	32.1	58.0	116.0	ESE	7.9	2.2	0.0	0.0
05-04-2024	21	30.3	62.0	123.0	ESE	16.9	4.7	0.0	0.0
05-04-2024	22	28.9	68.0	168.0	SES	3.2	0.9	0.0	0.0
05-04-2024	23	27.5	70.0	135.0	SE	2.5	0.7	0.0	0.0
05-04-2024	24	26.0	73.0	135.0	SE	16.9	4.7	0.0	0.0
06-04-2024	1	25.7	72.0	135.0	SE	11.5	3.2	0.0	0.0
06-04-2024	2	25.3	72.0	135.0	SE	8.3	2.3	0.0	0.0
06-04-2024	3	24.8	72.0	33.0	NNE	1.2	0.3	0.0	0.0
06-04-2024	4	24.5	71.0	135.0	SE	2.5	0.7	0.0	0.0
06-04-2024	5	24.4	68.0	19.0	NNE	7.9	2.2	0.0	0.0
06-04-2024	6	26.2	66.0	123.0	ESE	3.1	0.9	0.0	0.0
06-04-2024	7	27.9	60.0	135.0	SE	3.6	1.0	0.0	0.0
06-04-2024	8	29.5	58.0	135.0	SE	3.6	1.0	0.0	0.0
06-04-2024	9	30.7	58.0	315.0	NW	9.9	2.7	0.0	0.0
06-04-2024	10	31.6	52.0	225.0	SW	11.7	3.3	0.0	0.0
06-04-2024	11	32.9	50.0	160.0	SES	16.6	4.6	0.0	0.0
06-04-2024	12	34.3	48.0	166.0	SES	15.5	4.3	0.0	0.0
06-04-2024	13	35.9	50.0	158.0	SES	15.8	4.4	0.0	0.0
06-04-2024	14	37.5	49.0	195.0	SSW	18.7	5.2	0.0	0.0
06-04-2024	15	38.6	46.3	225.0	SW	13.3	3.7	0.0	0.0
06-04-2024	16	39.6	47.0	315.0	NW	15.1	4.2	0.0	0.0
06-04-2024	17	40.3	49.0	315.0	NW	14.8	4.1	0.0	0.0
06-04-2024	18	38.1	49.0	135.0	SE	20.2	5.6	0.0	0.0
06-04-2024	19	35.4	53.0	225.0	SW	20.2	5.6	0.0	0.0
06-04-2024	20	33.1	58.0	225.0	SW	18.7	5.2	0.0	0.0
06-04-2024	21	30.2	63.0	225.0	SW	13.3	3.7	0.0	0.0
06-04-2024	22	27.8	68.0	225.0	SW	11.5	3.2	0.0	0.0
06-04-2024	23	26.5	70.0	225.0	SW	7.9	2.2	0.0	0.0
06-04-2024	24	24.4	71.0	135.0	SE	4.9	1.4	0.0	0.0
07-04-2024	1	23.7	73.0	135.0	SE	14.0	3.9	0.0	0.0
07-04-2024	2	23.1	74.0	135.0	SE	1.8	0.5	0.0	0.0
07-04-2024	3	22.4	73.2	135.0	SE	1.2	0.3	0.0	0.0
07-04-2024	4	22.2	72.2	135.0	SE	5.4	1.5	0.0	0.0
07-04-2024	5	22.9	71.0	58.0	ENE	3.7	1.0	0.0	0.0
07-04-2024	6	24.2	70.7	135.0	SE	10.8	3.0	0.0	0.0
07-04-2024	7	26.5	73.0	135.0	SE	10.8	3.0	0.0	0.0
07-04-2024	8	28.7	72.0	135.0	SE	8.0	2.2	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
07-04-2024	9	30.3	72.0	315.0	NW	13.0	3.6	0.0	0.0
07-04-2024	10	31.8	67.5	270.0	W	2.9	0.8	0.0	0.0
07-04-2024	11	33.5	63.0	315.0	NW	15.8	4.4	0.0	0.0
07-04-2024	12	35.3	58.5	315.0	NW	20.9	5.8	0.0	0.0
07-04-2024	13	36.6	55.6	315.0	NW	16.9	4.7	0.0	0.0
07-04-2024	14	38.2	54.0	315.0	NW	15.1	4.2	0.0	0.0
07-04-2024	15	39.3	51.5	315.0	NW	23.0	6.4	0.0	0.0
07-04-2024	16	39.7	50.5	115.0	ESE	17.3	4.8	0.0	0.0
07-04-2024	17	39.9	50.0	270.0	W	11.9	3.3	0.0	0.0
07-04-2024	18	38.6	53.0	270.0	W	7.9	2.2	0.0	0.0
07-04-2024	19	36.2	56.0	165.0	SES	13.3	3.7	0.0	0.0
07-04-2024	20	33.6	61.0	335.0	NWN	6.1	1.7	0.0	0.0
07-04-2024	21	30.9	63.0	270.0	W	15.1	4.2	0.0	0.0
07-04-2024	22	28.6	67.0	270.0	W	13.3	3.7	0.0	0.0
07-04-2024	23	27.6	70.0	270.0	W	10.1	2.8	0.0	0.0
07-04-2024	24	26.7	72.1	270.0	W	1.2	0.3	0.0	0.0
08-04-2024	1	26.5	71.7	270.0	W	4.3	1.2	0.0	0.0
08-04-2024	2	26.2	73.0	135.0	SE	11.9	3.3	0.0	0.0
08-04-2024	3	26.3	74.2	360.0	N	9.7	2.7	0.0	0.0
08-04-2024	4	26.8	72.0	360.0	N	3.2	0.9	0.0	0.0
08-04-2024	5	27.5	70.0	135.0	SE	4.3	1.2	0.0	0.0
08-04-2024	6	28.1	71.0	135.0	SE	15.5	4.3	0.0	0.0
08-04-2024	7	28.8	74.0	180.0	S	9.7	2.7	0.0	0.0
08-04-2024	8	29.6	72.0	115.0	ESE	13.0	3.6	0.0	0.0
08-04-2024	9	30.5	72.4	45.0	NE	8.6	2.4	0.0	0.0
08-04-2024	10	31.3	67.5	225.0	SW	2.5	0.7	0.0	0.0
08-04-2024	11	32.7	65.0	156.0	SES	15.1	4.2	0.0	0.0
08-04-2024	12	34.4	62.5	148.0	SES	18.7	5.2	0.0	0.0
08-04-2024	13	36.0	58.6	315.0	NW	20.5	5.7	0.0	0.0
08-04-2024	14	37.5	55.5	165.0	SES	16.9	4.7	0.0	0.0
08-04-2024	15	38.6	53.0	148.0	SES	18.4	5.1	0.0	0.0
08-04-2024	16	39.7	51.0	315.0	NW	16.6	4.6	0.0	0.0
08-04-2024	17	40.2	50.0	315.0	NW	13.3	3.7	0.0	0.0
08-04-2024	18	39.9	47.0	135.0	SE	16.9	4.7	0.0	0.0
08-04-2024	19	37.8	51.0	135.0	SE	7.9	2.2	0.0	0.0
08-04-2024	20	35.4	54.0	270.0	W	15.8	4.4	0.0	0.0
08-04-2024	21	33.1	58.0	315.0	NW	13.3	3.7	0.0	0.0
08-04-2024	22	30.6	62.0	315.0	NW	9.7	2.7	0.0	0.0
08-04-2024	23	28.3	66.0	258.0	WSW	9.0	2.5	0.0	0.0
08-04-2024	24	26.3	69.0	315.0	NW	3.6	1.0	0.0	0.0
09-04-2024	1	25.6	72.0	110.0	ESE	3.6	1.0	0.0	0.0
09-04-2024	2	25.3	72.0	225.0	SW	4.9	1.4	0.0	0.0
09-04-2024	3	25.1	72.0	115.0	ESE	7.9	2.2	0.0	0.0
09-04-2024	4	24.8	72.0	330.0	NWN	9.7	2.7	0.0	0.0
09-04-2024	5	24.7	68.0	270.0	W	5.8	1.6	0.0	0.0
09-04-2024	6	26.4	66.0	168.0	SES	11.5	3.2	0.0	0.0
09-04-2024	7	28.1	60.0	225.0	SW	3.6	1.0	0.0	0.0
09-04-2024	8	29.6	55.0	225.0	SW	10.8	3.0	0.0	0.0
09-04-2024	9	30.6	53.0	225.0	SW	14.4	4.0	0.0	0.0
09-04-2024	10	31.4	51.0	270.0	W	8.6	2.4	0.0	0.0
09-04-2024	11	32.6	49.0	255.0	WSW	15.8	4.4	0.0	0.0
09-04-2024	12	34.1	48.0	315.0	NW	13.3	3.7	0.0	0.0
09-04-2024	13	35.5	51.0	315.0	NW	16.9	4.7	0.0	0.0
09-04-2024	14	36.4	50.4	315.0	NW	15.8	4.4	0.0	0.0
09-04-2024	15	37.3	49.9	315.0	NW	8.0	2.2	0.0	0.0
09-04-2024	16	38.7	49.4	315.0	NW	8.6	2.4	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
09-04-2024	17	38.2	48.6	315.0	NW	13.3	3.7	0.0	0.0
09-04-2024	18	36.5	50.0	135.0	SE	15.8	4.4	0.0	0.0
09-04-2024	19	33.8	54.0	135.0	SE	14.0	3.9	0.0	0.0
09-04-2024	20	32.2	58.0	135.0	SE	12.2	3.4	0.0	0.0
09-04-2024	21	30.8	63.0	328.0	NWN	13.3	3.7	0.0	0.0
09-04-2024	22	29.4	64.0	135.0	SE	2.5	0.7	0.0	0.0
09-04-2024	23	28.7	67.0	135.0	SE	3.6	1.0	0.0	0.0
09-04-2024	24	27.8	67.0	135.0	SE	1.8	0.5	0.0	0.0
10-04-2024	1	27.5	70.0	135.0	SE	5.4	1.5	0.0	0.0
10-04-2024	2	27.3	73.0	341.0	NWN	12.6	3.5	0.0	0.0
10-04-2024	3	27.2	73.0	15.0	NNE	9.0	2.5	0.0	0.0
10-04-2024	4	27.5	73.0	180.0	S	10.4	2.9	0.0	0.0
10-04-2024	5	27.9	70.0	180.0	S	4.9	1.4	0.0	0.0
10-04-2024	6	28.5	70.0	180.0	S	1.8	0.5	0.0	0.0
10-04-2024	7	29.2	68.0	152.0	SES	11.5	3.2	0.0	0.0
10-04-2024	8	30.1	65.0	270.0	W	3.6	1.0	0.0	0.0
10-04-2024	9	31.1	60.0	315.0	NW	14.4	4.0	0.0	0.0
10-04-2024	10	31.8	58.0	315.0	NW	7.9	2.2	0.0	0.0
10-04-2024	11	33.1	56.0	315.0	NW	9.4	2.6	0.0	0.0
10-04-2024	12	34.9	55.0	315.0	NW	13.3	3.7	0.0	0.0
10-04-2024	13	36.6	53.0	315.0	NW	15.8	4.4	0.0	0.0
10-04-2024	14	37.6	50.0	315.0	NW	15.5	4.3	0.0	0.0
10-04-2024	15	38.4	48.0	315.0	NW	14.0	3.9	0.0	0.0
10-04-2024	16	38.9	49.0	315.0	NW	13.0	3.6	0.0	0.0
10-04-2024	17	39.2	50.0	315.0	NW	13.3	3.7	0.0	0.0
10-04-2024	18	37.6	52.0	270.0	W	19.1	5.3	0.0	0.0
10-04-2024	19	35.6	55.0	315.0	NW	13.7	3.8	0.0	0.0
10-04-2024	20	33.7	59.0	255.0	WSW	16.9	4.7	0.0	0.0
10-04-2024	21	31.6	63.0	270.0	W	13.0	3.6	0.0	0.0
10-04-2024	22	30.1	65.0	270.0	W	4.0	1.1	0.0	0.0
10-04-2024	23	28.4	67.0	270.0	W	1.2	0.3	0.0	0.0
10-04-2024	24	27.7	70.0	270.0	W	10.8	3.0	0.0	0.0
11-04-2024	1	27.2	71.3	245.0	WSW	3.1	0.9	0.0	0.0
11-04-2024	2	26.6	73.0	225.0	SW	12.6	3.5	0.0	0.0
11-04-2024	3	26.2	74.6	45.0	NE	14.4	4.0	0.0	0.0
11-04-2024	4	25.6	75.2	270.0	W	10.8	3.0	0.0	0.0
11-04-2024	5	25.4	76.5	15.0	NNE	9.4	2.6	0.0	0.0
11-04-2024	6	27.1	77.7	25.0	NNE	4.3	1.2	0.0	0.0
11-04-2024	7	28.4	78.3	135.0	SE	7.9	2.2	0.0	0.0
11-04-2024	8	30.5	78.9	180.0	S	10.8	3.0	0.0	0.0
11-04-2024	9	32.3	79.2	180.0	S	14.4	4.0	0.0	0.0
11-04-2024	10	33.5	77.3	180.0	S	14.4	4.0	0.0	0.0
11-04-2024	11	35.2	74.1	180.0	S	8.6	2.4	0.0	0.0
11-04-2024	12	36.7	71.2	116.0	ESE	19.1	5.3	0.0	0.0
11-04-2024	13	37.7	68.8	256.0	WSW	25.2	7.0	0.0	0.0
11-04-2024	14	38.6	65.4	247.0	WSW	21.6	6.0	0.0	0.0
11-04-2024	15	39.2	62.2	315.0	NW	18.0	5.0	0.0	0.0
11-04-2024	16	39.5	57.8	315.0	NW	18.0	5.0	0.0	0.0
11-04-2024	17	40.3	54.3	315.0	NW	15.8	4.4	0.0	0.0
11-04-2024	18	39.6	51.3	135.0	SE	18.4	5.1	0.0	0.0
11-04-2024	19	36.7	51.8	135.0	SE	22.7	6.3	0.0	0.0
11-04-2024	20	33.7	53.0	135.0	SE	13.3	3.7	0.0	0.0
11-04-2024	21	31.1	53.0	135.0	SE	14.4	4.0	0.0	0.0
11-04-2024	22	28.2	57.0	333.0	NWN	13.3	3.7	0.0	0.0
11-04-2024	23	27.1	63.0	135.0	SE	9.0	2.5	0.0	0.0
11-04-2024	24	25.6	65.0	135.0	SE	7.2	2.0	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
12-04-2024	1	24.4	65.0	135.0	SE	5.4	1.5	0.0	0.0
12-04-2024	2	23.6	65.0	25.0	NNE	2.5	0.7	0.0	0.0
12-04-2024	3	22.3	68.0	156.0	SES	1.2	0.3	0.0	0.0
12-04-2024	4	21.6	68.0	168.0	SES	7.2	2.0	0.0	0.0
12-04-2024	5	20.7	68.0	333.0	NWN	3.2	0.9	0.0	0.0
12-04-2024	6	22.2	66.0	135.0	SE	10.8	3.0	0.0	0.0
12-04-2024	7	23.7	63.0	115.0	ESE	14.4	4.0	0.0	0.0
12-04-2024	8	25.2	58.0	225.0	SW	7.9	2.2	0.0	0.0
12-04-2024	9	26.7	56.0	45.0	NE	10.8	3.0	0.0	0.0
12-04-2024	10	28.4	54.0	210.0	SSW	9.4	2.6	0.0	0.0
12-04-2024	11	31.1	52.0	315.0	NW	14.4	4.0	0.0	0.0
12-04-2024	12	33.2	51.0	315.0	NW	13.3	3.7	0.0	0.0
12-04-2024	13	35.2	50.0	315.0	NW	16.6	4.6	0.0	0.0
12-04-2024	14	36.6	49.0	315.0	NW	18.7	5.2	0.0	0.0
12-04-2024	15	38.4	50.0	315.0	NW	23.0	6.4	0.0	0.0
12-04-2024	16	39.7	48.0	180.0	S	16.6	4.6	0.0	0.0
12-04-2024	17	40.2	51.0	45.0	NE	19.4	5.4	0.0	0.0
12-04-2024	18	38.4	52.0	303.0	WNW	13.3	3.7	0.0	0.0
12-04-2024	19	36.7	55.0	303.0	WNW	22.7	6.3	0.0	0.0
12-04-2024	20	34.3	59.0	329.0	NWN	14.4	4.0	0.0	0.0
12-04-2024	21	32.2	61.0	289.0	WNW	9.0	2.5	0.0	0.0
12-04-2024	22	29.7	64.0	293.0	WNW	6.1	1.7	0.0	0.0
12-04-2024	23	28.4	64.0	225.0	SW	9.0	2.5	0.0	0.0
12-04-2024	24	27.5	66.0	270.0	W	4.7	1.3	0.0	0.0
13-04-2024	1	26.8	70.0	166.0	SES	4.9	1.4	0.0	0.0
13-04-2024	2	26.5	73.0	45.0	NE	2.5	0.7	0.0	0.0
13-04-2024	3	26.7	73.0	225.0	SW	1.9	0.5	0.0	0.0
13-04-2024	4	27.2	73.0	315.0	NW	9.0	2.5	0.0	0.0
13-04-2024	5	28.2	70.0	270.0	W	10.4	2.9	0.0	0.0
13-04-2024	6	28.8	68.0	270.0	W	11.5	3.2	0.0	0.0
13-04-2024	7	29.3	64.0	256.0	WSW	16.2	4.5	0.0	0.0
13-04-2024	8	30.1	62.0	135.0	SE	7.4	2.1	0.0	0.0
13-04-2024	9	31.0	60.0	315.0	NW	8.6	2.4	0.0	0.0
13-04-2024	10	32.2	58.0	116.0	ESE	13.3	3.7	0.0	0.0
13-04-2024	11	33.5	53.0	315.0	NW	14.4	4.0	0.0	0.0
13-04-2024	12	35.9	53.0	315.0	NW	18.0	5.0	0.0	0.0
13-04-2024	13	38.1	52.0	315.0	NW	14.4	4.0	0.0	0.0
13-04-2024	14	39.2	51.0	315.0	NW	21.6	6.0	0.0	0.0
13-04-2024	15	39.6	49.0	315.0	NW	17.3	4.8	0.0	0.0
13-04-2024	16	39.8	49.0	180.0	S	14.4	4.0	0.0	0.0
13-04-2024	17	40.1	49.0	315.0	NW	10.8	3.0	0.0	0.0
13-04-2024	18	39.7	53.0	315.0	NW	13.3	3.7	0.0	0.0
13-04-2024	19	37.0	56.0	90.0	E	15.5	4.3	0.0	0.0
13-04-2024	20	34.1	59.0	135.0	SE	13.7	3.8	0.0	0.0
13-04-2024	21	30.5	62.0	315.0	NW	7.9	2.2	0.0	0.0
13-04-2024	22	28.0	64.0	315.0	NW	5.0	1.4	0.0	0.0
13-04-2024	23	26.7	66.0	180.0	S	10.8	3.0	0.0	0.0
13-04-2024	24	25.5	68.0	135.0	SE	7.2	2.0	0.0	0.0
14-04-2024	1	25.0	72.0	135.0	SE	1.8	0.5	0.0	0.0
14-04-2024	2	24.5	71.0	135.0	SE	5.8	1.6	0.0	0.0
14-04-2024	3	24.0	68.0	15.0	NNE	4.3	1.2	0.0	0.0
14-04-2024	4	23.9	68.0	18.0	NNE	7.9	2.2	0.0	0.0
14-04-2024	5	24.0	68.0	180.0	S	4.3	1.2	0.0	0.0
14-04-2024	6	25.5	65.0	68.0	ENE	1.8	0.5	0.0	0.0
14-04-2024	7	27.0	59.0	116.0	ESE	4.9	1.4	0.0	0.0
14-04-2024	8	28.5	57.0	45.0	NE	7.4	2.1	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
14-04-2024	9	30.0	56.0	270.0	W	8.6	2.4	0.0	0.0
14-04-2024	10	31.7	54.0	315.0	NW	10.8	3.0	0.0	0.0
14-04-2024	11	33.4	53.0	315.0	NW	14.4	4.0	0.0	0.0
14-04-2024	12	35.2	52.0	315.0	NW	15.1	4.2	0.0	0.0
14-04-2024	13	36.5	50.0	315.0	NW	18.0	5.0	0.0	0.0
14-04-2024	14	37.7	50.0	315.0	NW	14.4	4.0	0.0	0.0
14-04-2024	15	38.6	50.0	315.0	NW	13.3	3.7	0.0	0.0
14-04-2024	16	39.5	48.0	315.0	NW	19.8	5.5	0.0	0.0
14-04-2024	17	40.4	49.0	315.0	NW	16.9	4.7	0.0	0.0
14-04-2024	18	39.5	51.0	135.0	SE	16.6	4.6	0.0	0.0
14-04-2024	19	37.3	54.0	135.0	SE	18.0	5.0	0.0	0.0
14-04-2024	20	34.9	57.0	225.0	SW	15.8	4.4	0.0	0.0
14-04-2024	21	32.2	61.0	135.0	SE	1.2	0.3	0.0	0.0
14-04-2024	22	29.6	61.0	135.0	SE	1.9	0.5	0.0	0.0
14-04-2024	23	28.3	64.0	135.0	SE	9.0	2.5	0.0	0.0
14-04-2024	24	26.8	66.0	290.0	WNW	1.8	0.5	0.0	0.0
15-04-2024	1	26.5	69.0	112.0	ESE	5.4	1.5	0.0	0.0
15-04-2024	2	26.4	73.0	270.0	W	2.5	0.7	0.0	0.0
15-04-2024	3	26.8	73.0	270.0	W	5.8	1.6	0.0	0.0
15-04-2024	4	27.3	70.0	315.0	NW	7.9	2.2	0.0	0.0
15-04-2024	5	27.7	70.0	315.0	NW	5.4	1.5	0.0	0.0
15-04-2024	6	28.2	67.0	315.0	NW	10.8	3.0	0.0	0.0
15-04-2024	7	28.9	64.0	315.0	NW	8.6	2.4	0.0	0.0
15-04-2024	8	30.1	62.0	315.0	NW	15.5	4.3	0.0	0.0
15-04-2024	9	30.9	60.0	315.0	NW	14.4	4.0	0.0	0.0
15-04-2024	10	31.8	58.0	315.0	NW	16.6	4.6	0.0	0.0
15-04-2024	11	33.5	56.0	315.0	NW	19.8	5.5	0.0	0.0
15-04-2024	12	35.6	55.0	315.0	NW	16.9	4.7	0.0	0.0
15-04-2024	13	37.0	54.0	315.0	NW	14.0	3.9	0.0	0.0
15-04-2024	14	38.1	52.0	315.0	NW	18.4	5.1	0.0	0.0
15-04-2024	15	38.9	53.0	315.0	NW	18.7	5.2	0.0	0.0
15-04-2024	16	40.4	54.0	315.0	NW	16.9	4.7	0.0	0.0
15-04-2024	17	40.6	55.0	315.0	NW	10.8	3.0	0.0	0.0
15-04-2024	18	40.5	56.0	303.0	WNW	15.8	4.4	0.0	0.0
15-04-2024	19	37.6	58.0	90.0	E	20.2	5.6	0.0	0.0
15-04-2024	20	34.4	62.0	327.0	NWN	15.5	4.3	0.0	0.0
15-04-2024	21	32.2	64.0	270.0	W	8.6	2.4	0.0	0.0
15-04-2024	22	29.8	69.0	270.0	W	5.4	1.5	0.0	0.0
15-04-2024	23	27.5	69.6	270.0	W	10.8	3.0	0.0	0.0
15-04-2024	24	26.4	70.4	255.0	WSW	12.6	3.5	0.0	0.0
16-04-2024	1	26.3	71.1	257.0	WSW	16.2	4.5	0.0	0.0
16-04-2024	2	26.0	71.6	315.0	NW	9.0	2.5	0.0	0.0
16-04-2024	3	25.8	72.2	135.0	SE	5.4	1.5	0.0	0.0
16-04-2024	4	26.7	70.6	135.0	SE	13.0	3.6	0.0	0.0
16-04-2024	5	28.2	69.5	315.0	NW	11.9	3.3	0.0	0.0
16-04-2024	6	29.3	68.6	270.0	W	2.5	0.7	0.0	0.0
16-04-2024	7	29.8	67.3	135.0	SE	7.9	2.2	0.0	0.0
16-04-2024	8	30.4	65.5	270.0	W	15.5	4.3	0.0	0.0
16-04-2024	9	31.7	64.4	270.0	W	2.5	0.7	0.0	0.0
16-04-2024	10	33.3	63.6	315.0	NW	13.3	3.7	0.0	0.0
16-04-2024	11	35.2	61.4	315.0	NW	11.7	3.3	0.0	0.0
16-04-2024	12	37.2	58.0	315.0	NW	15.8	4.4	0.0	0.0
16-04-2024	13	38.2	56.0	315.0	NW	16.6	4.6	0.0	0.0
16-04-2024	14	38.9	55.0	315.0	NW	18.7	5.2	0.0	0.0
16-04-2024	15	39.6	53.0	315.0	NW	25.6	7.1	0.0	0.0
16-04-2024	16	40.2	52.0	315.0	NW	22.7	6.3	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
16-04-2024	17	40.6	51.0	315.0	NW	16.9	4.7	0.0	0.0
16-04-2024	18	39.2	52.0	135.0	SE	13.3	3.7	0.0	0.0
16-04-2024	19	37.8	55.0	135.0	SE	7.9	2.2	0.0	0.0
16-04-2024	20	35.6	58.0	135.0	SE	2.5	0.7	0.0	0.0
16-04-2024	21	32.4	62.0	333.0	NWN	1.2	0.3	0.0	0.0
16-04-2024	22	29.3	67.0	345.0	NWN	4.7	1.3	0.0	0.0
16-04-2024	23	27.6	70.0	90.0	E	7.9	2.2	0.0	0.0
16-04-2024	24	26.7	71.1	45.0	NE	1.2	0.3	0.0	0.0
17-04-2024	1	26.5	72.1	303.0	WNW	5.8	1.6	0.0	0.0
17-04-2024	2	25.6	72.6	333.0	NWN	11.9	3.3	0.0	0.0
17-04-2024	3	25.2	71.7	135.0	SE	15.1	4.2	0.0	0.0
17-04-2024	4	24.4	73.1	315.0	NW	6.8	1.9	0.0	0.0
17-04-2024	5	24.2	71.3	255.0	WSW	2.2	0.6	0.0	0.0
17-04-2024	6	25.8	70.7	250.0	WSW	12.6	3.5	0.0	0.0
17-04-2024	7	27.4	74.0	248.0	WSW	15.8	4.4	0.0	0.0
17-04-2024	8	29.8	72.0	238.0	WSW	13.3	3.7	0.0	0.0
17-04-2024	9	32.2	71.0	315.0	NW	16.2	4.5	0.0	0.0
17-04-2024	10	33.7	67.5	315.0	NW	13.3	3.7	0.0	0.0
17-04-2024	11	35.4	65.0	270.0	W	20.2	5.6	0.0	0.0
17-04-2024	12	37.1	62.0	315.0	NW	17.3	4.8	0.0	0.0
17-04-2024	13	38.3	58.0	225.0	SW	20.2	5.6	0.0	0.0
17-04-2024	14	38.8	55.0	315.0	NW	13.7	3.8	0.0	0.0
17-04-2024	15	39.4	51.0	135.0	SE	16.2	4.5	0.0	0.0
17-04-2024	16	39.8	50.5	315.0	NW	22.3	6.2	0.0	0.0
17-04-2024	17	40.2	50.0	315.0	NW	15.8	4.4	0.0	0.0
17-04-2024	18	40.1	51.0	270.0	W	13.7	3.8	0.0	0.0
17-04-2024	19	38.8	54.0	270.0	W	11.9	3.3	0.0	0.0
17-04-2024	20	36.3	56.0	135.0	SE	10.8	3.0	0.0	0.0
17-04-2024	21	33.2	60.0	315.0	NW	7.9	2.2	0.0	0.0
17-04-2024	22	31.0	64.0	270.0	W	11.9	3.3	0.0	0.0
17-04-2024	23	28.3	66.0	293.0	WNW	13.0	3.6	0.0	0.0
17-04-2024	24	25.9	69.0	135.0	SE	1.9	0.5	0.0	0.0
18-04-2024	1	25.2	68.0	202.0	SSW	10.8	3.0	0.0	0.0
18-04-2024	2	25.4	68.0	270.0	W	9.0	2.5	0.0	0.0
18-04-2024	3	25.5	72.0	270.0	W	1.2	0.3	0.0	0.0
18-04-2024	4	25.9	69.0	304.0	WNW	5.4	1.5	0.0	0.0
18-04-2024	5	26.6	66.0	225.0	SW	9.4	2.6	0.0	0.0
18-04-2024	6	27.1	63.0	315.0	NW	9.0	2.5	0.0	0.0
18-04-2024	7	27.7	63.0	135.0	SE	11.9	3.3	0.0	0.0
18-04-2024	8	28.2	60.0	328.0	NWN	4.7	1.3	0.0	0.0
18-04-2024	9	29.3	58.0	315.0	NW	15.5	4.3	0.0	0.0
18-04-2024	10	31.0	56.0	315.0	NW	13.3	3.7	0.0	0.0
18-04-2024	11	33.0	56.0	315.0	NW	16.6	4.6	0.0	0.0
18-04-2024	12	34.9	55.0	315.0	NW	19.4	5.4	0.0	0.0
18-04-2024	13	36.7	53.0	90.0	E	15.1	4.2	0.0	0.0
18-04-2024	14	37.6	50.0	180.0	S	23.0	6.4	0.0	0.0
18-04-2024	15	39.1	49.6	256.0	WSW	13.3	3.7	0.0	0.0
18-04-2024	16	39.7	50.0	315.0	NW	16.9	4.7	0.0	0.0
18-04-2024	17	40.4	50.0	315.0	NW	14.8	4.1	0.0	0.0
18-04-2024	18	39.3	51.0	135.0	SE	15.5	4.3	0.0	0.0
18-04-2024	19	37.2	52.0	45.0	NE	4.0	1.1	0.0	0.0
18-04-2024	20	35.0	55.0	135.0	SE	1.8	0.5	0.0	0.0
18-04-2024	21	33.0	59.0	360.0	N	0.6	0.2	0.0	0.0
18-04-2024	22	31.1	63.0	120.0	ESE	1.2	0.3	0.0	0.0
18-04-2024	23	29.2	64.0	225.0	SW	4.3	1.2	0.0	0.0
18-04-2024	24	27.4	65.4	225.0	SW	1.9	0.5	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
19-04-2024	1	27.1	66.7	225.0	SW	4.9	1.4	0.0	0.0
19-04-2024	2	26.7	68.2	315.0	NW	3.1	0.9	0.0	0.0
19-04-2024	3	26.5	69.2	315.0	NW	2.5	0.7	0.0	0.0
19-04-2024	4	26.8	70.2	315.0	NW	1.8	0.5	0.0	0.0
19-04-2024	5	27.2	70.6	225.0	SW	3.7	1.0	0.0	0.0
19-04-2024	6	27.6	71.2	315.0	NW	12.6	3.5	0.0	0.0
19-04-2024	7	28.5	70.0	225.0	SW	10.8	3.0	0.0	0.0
19-04-2024	8	29.6	68.0	225.0	SW	7.9	2.2	0.0	0.0
19-04-2024	9	31.3	66.0	360.0	N	14.4	4.0	0.0	0.0
19-04-2024	10	33.0	62.0	180.0	S	13.0	3.6	0.0	0.0
19-04-2024	11	34.5	56.0	180.0	S	8.0	2.2	0.0	0.0
19-04-2024	12	36.5	53.0	315.0	NW	12.6	3.5	0.0	0.0
19-04-2024	13	38.1	52.0	315.0	NW	15.8	4.4	0.0	0.0
19-04-2024	14	39.3	51.0	45.0	NE	7.9	2.2	0.0	0.0
19-04-2024	15	39.6	49.0	315.0	NW	12.6	3.5	0.0	0.0
19-04-2024	16	40.1	50.0	315.0	NW	8.6	2.4	0.0	0.0
19-04-2024	17	40.1	49.0	180.0	S	13.3	3.7	0.0	0.0
19-04-2024	18	38.6	52.0	135.0	SE	13.7	3.8	0.0	0.0
19-04-2024	19	36.5	55.0	289.0	WNW	15.1	4.2	0.0	0.0
19-04-2024	20	33.0	59.0	315.0	NW	12.6	3.5	0.0	0.0
19-04-2024	21	30.0	62.0	121.0	ESE	1.2	0.3	0.0	0.0
19-04-2024	22	28.5	64.0	315.0	NW	1.8	0.5	0.0	0.0
19-04-2024	23	27.5	66.0	327.0	NWN	10.5	2.9	0.0	0.0
19-04-2024	24	26.5	69.0	328.0	NWN	9.7	2.7	0.0	0.0
20-04-2024	1	26.0	69.0	135.0	SE	2.5	0.7	0.0	0.0
20-04-2024	2	25.6	68.0	135.0	SE	4.3	1.2	0.0	0.0
20-04-2024	3	25.5	67.0	135.0	SE	1.2	0.3	0.0	0.0
20-04-2024	4	25.8	67.6	327.0	NWN	6.1	1.7	0.0	0.0
20-04-2024	5	26.2	69.0	345.0	NWN	9.4	2.6	0.0	0.0
20-04-2024	6	26.6	69.0	135.0	SE	13.7	3.8	0.0	0.0
20-04-2024	7	27.5	66.0	135.0	SE	5.4	1.5	0.0	0.0
20-04-2024	8	28.5	64.0	135.0	SE	11.5	3.2	0.0	0.0
20-04-2024	9	29.5	61.0	315.0	NW	9.3	2.6	0.0	0.0
20-04-2024	10	31.5	57.0	315.0	NW	8.6	2.4	0.0	0.0
20-04-2024	11	33.5	53.0	315.0	NW	14.4	4.0	0.0	0.0
20-04-2024	12	35.0	52.0	315.0	NW	12.9	3.6	0.0	0.0
20-04-2024	13	37.1	51.0	315.0	NW	16.5	4.6	0.0	0.0
20-04-2024	14	38.8	51.0	315.0	NW	13.3	3.7	0.0	0.0
20-04-2024	15	40.5	49.0	315.0	NW	15.1	4.2	0.0	0.0
20-04-2024	16	40.0	50.0	315.0	NW	17.3	4.8	0.0	0.0
20-04-2024	17	39.4	50.0	315.0	NW	13.6	3.8	0.0	0.0
20-04-2024	18	38.9	53.0	315.0	NW	13.3	3.7	0.0	0.0
20-04-2024	19	35.5	55.0	315.0	NW	7.9	2.2	0.0	0.0
20-04-2024	20	32.0	58.0	360.0	N	3.7	1.0	0.0	0.0
20-04-2024	21	30.0	62.0	135.0	SE	1.2	0.3	0.0	0.0
20-04-2024	22	28.0	67.0	135.0	SE	9.3	2.6	0.0	0.0
20-04-2024	23	27.0	70.0	270.0	W	3.1	0.9	0.0	0.0
20-04-2024	24	25.9	73.0	270.0	W	12.6	3.5	0.0	0.0
21-04-2024	1	25.5	72.0	135.0	SE	8.3	2.3	0.0	0.0
21-04-2024	2	25.0	68.0	329.0	NWN	1.2	0.3	0.0	0.0
21-04-2024	3	24.9	68.0	135.0	SE	15.1	4.2	0.0	0.0
21-04-2024	4	24.5	64.0	135.0	SE	5.4	1.5	0.0	0.0
21-04-2024	5	24.6	64.0	135.0	SE	10.8	3.0	0.0	0.0
21-04-2024	6	25.5	61.0	135.0	SE	4.9	1.4	0.0	0.0
21-04-2024	7	26.6	59.0	327.0	NWN	8.6	2.4	0.0	0.0
21-04-2024	8	28.1	57.0	135.0	SE	3.1	0.9	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
21-04-2024	9	29.5	55.0	315.0	NW	13.3	3.7	0.0	0.0
21-04-2024	10	31.1	51.0	45.0	NE	15.1	4.2	0.0	0.0
21-04-2024	11	33.0	50.0	315.0	NW	19.8	5.5	0.0	0.0
21-04-2024	12	35.5	49.0	315.0	NW	13.3	3.7	0.0	0.0
21-04-2024	13	37.2	49.0	315.0	NW	15.5	4.3	0.0	0.0
21-04-2024	14	38.7	47.0	315.0	NW	23.8	6.6	0.0	0.0
21-04-2024	15	39.2	47.0	315.0	NW	14.4	4.0	0.0	0.0
21-04-2024	16	39.6	47.0	270.0	W	13.3	3.7	0.0	0.0
21-04-2024	17	39.8	47.0	270.0	W	18.7	5.2	0.0	0.0
21-04-2024	18	38.2	48.0	303.0	WNW	18.0	5.0	0.0	0.0
21-04-2024	19	36.6	56.0	303.0	WNW	7.9	2.2	0.0	0.0
21-04-2024	20	34.2	54.0	135.0	SE	13.0	3.6	0.0	0.0
21-04-2024	21	32.1	58.0	330.0	NWN	9.7	2.7	0.0	0.0
21-04-2024	22	29.3	61.0	135.0	SE	5.8	1.6	0.0	0.0
21-04-2024	23	27.1	63.0	270.0	W	4.3	1.2	0.0	0.0
21-04-2024	24	26.4	66.0	315.0	NW	1.9	0.5	0.0	0.0
22-04-2024	1	26.0	66.0	270.0	W	4.9	1.4	0.0	0.0
22-04-2024	2	25.6	65.0	135.0	SE	2.5	0.7	0.0	0.0
22-04-2024	3	25.0	68.0	270.0	W	8.3	2.3	0.0	0.0
22-04-2024	4	24.6	68.0	45.0	NE	11.9	3.3	0.0	0.0
22-04-2024	5	25.5	65.0	195.0	SSW	2.2	0.6	0.0	0.0
22-04-2024	6	27.0	63.0	135.0	SE	8.0	2.2	0.0	0.0
22-04-2024	7	28.5	60.0	116.0	ESE	1.8	0.5	0.0	0.0
22-04-2024	8	29.9	59.0	135.0	SE	9.3	2.6	0.0	0.0
22-04-2024	9	31.4	57.0	315.0	NW	4.0	1.1	0.0	0.0
22-04-2024	10	33.0	53.0	315.0	NW	16.2	4.5	0.0	0.0
22-04-2024	11	35.0	52.0	315.0	NW	12.6	3.5	0.0	0.0
22-04-2024	12	36.2	50.0	315.0	NW	12.6	3.5	0.0	0.0
22-04-2024	13	37.3	50.0	315.0	NW	9.4	2.6	0.0	0.0
22-04-2024	14	38.3	51.0	315.0	NW	12.6	3.5	0.0	0.0
22-04-2024	15	38.8	50.0	135.0	SE	2.5	0.7	0.0	0.0
22-04-2024	16	39.4	50.0	270.0	W	13.0	3.6	0.0	0.0
22-04-2024	17	39.7	50.0	303.0	WNW	9.4	2.6	0.0	0.0
22-04-2024	18	39.2	53.0	135.0	SE	8.6	2.4	0.0	0.0
22-04-2024	19	38.0	57.0	135.0	SE	3.7	1.0	0.0	0.0
22-04-2024	20	35.0	60.0	135.0	SE	1.9	0.5	0.0	0.0
22-04-2024	21	32.3	64.0	135.0	SE	3.6	1.0	0.0	0.0
22-04-2024	22	29.3	68.0	270.0	W	7.9	2.2	0.0	0.0
22-04-2024	23	28.0	70.0	225.0	SW	2.2	0.6	0.0	0.0
22-04-2024	24	27.0	73.0	225.0	SW	8.6	2.4	0.0	0.0
23-04-2024	1	26.5	73.0	304.0	WNW	4.0	1.1	0.0	0.0
23-04-2024	2	26.0	73.0	242.0	WSW	3.1	0.9	0.0	0.0
23-04-2024	3	25.5	72.0	315.0	NW	4.3	1.2	0.0	0.0
23-04-2024	4	25.4	71.0	315.0	NW	2.5	0.7	0.0	0.0
23-04-2024	5	25.8	71.0	315.0	NW	13.0	3.6	0.0	0.0
23-04-2024	6	26.6	73.0	315.0	NW	13.7	3.8	0.0	0.0
23-04-2024	7	27.8	70.0	315.0	NW	16.2	4.5	0.0	0.0
23-04-2024	8	28.7	67.0	135.0	SE	3.6	1.0	0.0	0.0
23-04-2024	9	30.2	62.0	315.0	NW	2.5	0.7	0.0	0.0
23-04-2024	10	31.8	58.0	315.0	NW	7.9	2.2	0.0	0.0
23-04-2024	11	34.1	56.0	90.0	E	10.8	3.0	0.0	0.0
23-04-2024	12	36.2	55.0	180.0	S	14.4	4.0	0.0	0.0
23-04-2024	13	37.3	54.0	90.0	E	7.9	2.2	0.0	0.0
23-04-2024	14	38.4	53.0	225.0	SW	13.3	3.7	0.0	0.0
23-04-2024	15	39.4	52.0	90.0	E	14.4	4.0	0.0	0.0
23-04-2024	16	39.9	52.0	90.0	E	12.2	3.4	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
23-04-2024	17	40.4	50.0	315.0	NW	15.5	4.3	0.0	0.0
23-04-2024	18	40.6	51.0	135.0	SE	11.9	3.3	0.0	0.0
23-04-2024	19	38.1	54.0	90.0	E	9.0	2.5	0.0	0.0
23-04-2024	20	35.7	56.0	135.0	SE	10.8	3.0	0.0	0.0
23-04-2024	21	33.1	61.0	327.0	NWN	7.9	2.2	0.0	0.0
23-04-2024	22	29.8	64.0	290.0	WNW	4.9	1.4	0.0	0.0
23-04-2024	23	27.6	67.0	315.0	NW	2.9	0.8	0.0	0.0
23-04-2024	24	26.5	73.0	90.0	E	5.8	1.6	0.0	0.0
24-04-2024	1	26.4	73.0	225.0	SW	3.1	0.9	0.0	0.0
24-04-2024	2	26.3	74.2	225.0	SW	9.0	2.5	0.0	0.0
24-04-2024	3	26.5	75.2	225.0	SW	0.6	0.2	0.0	0.0
24-04-2024	4	27.1	76.7	225.0	SW	10.8	3.0	0.0	0.0
24-04-2024	5	27.6	78.5	135.0	SE	10.8	3.0	0.0	0.0
24-04-2024	6	28.2	79.2	135.0	SE	14.4	4.0	0.0	0.0
24-04-2024	7	28.6	79.3	135.0	SE	10.8	3.0	0.0	0.0
24-04-2024	8	28.9	78.8	135.0	SE	13.0	3.6	0.0	0.0
24-04-2024	9	30.1	76.4	315.0	NW	15.8	4.4	0.0	0.0
24-04-2024	10	32.0	73.2	315.0	NW	14.4	4.0	0.0	0.0
24-04-2024	11	34.5	69.6	315.0	NW	15.1	4.2	0.0	0.0
24-04-2024	12	36.9	67.6	315.0	NW	7.9	2.2	0.0	0.0
24-04-2024	13	38.5	65.4	315.0	NW	14.4	4.0	0.0	0.0
24-04-2024	14	39.5	63.2	315.0	NW	14.4	4.0	0.0	0.0
24-04-2024	15	40.6	60.6	315.0	NW	16.9	4.7	0.0	0.0
24-04-2024	16	40.2	58.6	315.0	NW	10.8	3.0	0.0	0.0
24-04-2024	17	40.0	56.3	315.0	NW	15.8	4.4	0.0	0.0
24-04-2024	18	39.9	54.3	290.0	WNW	10.8	3.0	0.0	0.0
24-04-2024	19	37.3	51.7	180.0	S	10.8	3.0	0.0	0.0
24-04-2024	20	34.4	54.0	315.0	NW	9.0	2.5	0.0	0.0
24-04-2024	21	32.1	55.0	315.0	NW	12.6	3.5	0.0	0.0
24-04-2024	22	29.2	58.0	245.0	WSW	11.5	3.2	0.0	0.0
24-04-2024	23	27.5	62.3	74.0	ENE	7.9	2.2	0.0	0.0
24-04-2024	24	27.0	64.6	315.0	NW	9.0	2.5	0.0	0.0
25-04-2024	1	26.8	68.6	135.0	SE	1.9	0.5	0.0	0.0
25-04-2024	2	26.5	71.3	135.0	SE	3.1	0.9	0.0	0.0
25-04-2024	3	26.0	74.3	180.0	S	1.2	0.3	0.0	0.0
25-04-2024	4	25.5	75.2	23.0	NNE	4.7	1.3	0.0	0.0
25-04-2024	5	25.0	76.5	135.0	SE	3.6	1.0	0.0	0.0
25-04-2024	6	25.6	77.3	270.0	W	10.8	3.0	0.0	0.0
25-04-2024	7	27.0	74.4	135.0	SE	10.8	3.0	0.0	0.0
25-04-2024	8	28.5	72.3	135.0	SE	14.4	4.0	0.0	0.0
25-04-2024	9	29.9	70.6	315.0	NW	4.0	1.1	0.0	0.0
25-04-2024	10	31.5	68.3	315.0	NW	9.9	2.7	0.0	0.0
25-04-2024	11	33.5	64.4	315.0	NW	8.0	2.2	0.0	0.0
25-04-2024	12	35.2	58.6	315.0	NW	9.3	2.6	0.0	0.0
25-04-2024	13	36.3	52.0	15.0	NNE	14.4	4.0	0.0	0.0
25-04-2024	14	37.8	51.0	225.0	SW	18.0	5.0	0.0	0.0
25-04-2024	15	39.2	50.0	163.0	SES	3.6	1.0	0.0	0.0
25-04-2024	16	39.6	50.0	24.0	NNE	8.6	2.4	0.0	0.0
25-04-2024	17	39.8	50.0	225.0	SW	3.6	1.0	0.0	0.0
25-04-2024	18	39.9	53.0	165.0	SES	9.3	2.6	0.0	0.0
25-04-2024	19	37.4	56.0	90.0	E	3.2	0.9	0.0	0.0
25-04-2024	20	34.2	59.0	315.0	NW	3.7	1.0	0.0	0.0
25-04-2024	21	31.4	63.0	270.0	W	1.9	0.5	0.0	0.0
25-04-2024	22	28.5	70.0	135.0	SE	1.2	0.3	0.0	0.0
25-04-2024	23	27.0	70.0	347.0	NWN	4.7	1.3	0.0	0.0
25-04-2024	24	26.5	73.0	346.0	NWN	2.5	0.7	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
26-04-2024	1	26.0	73.0	90.0	E	1.9	0.5	0.0	0.0
26-04-2024	2	25.5	74.3	90.0	E	3.6	1.0	0.0	0.0
26-04-2024	3	25.0	75.0	135.0	SE	10.8	3.0	0.0	0.0
26-04-2024	4	24.5	76.2	135.0	SE	3.6	1.0	0.0	0.0
26-04-2024	5	24.6	76.6	135.0	SE	4.9	1.4	0.0	0.0
26-04-2024	6	26.0	77.2	330.0	NWN	3.1	0.9	0.0	0.0
26-04-2024	7	27.6	77.7	270.0	W	3.6	1.0	0.0	0.0
26-04-2024	8	29.1	78.7	165.0	SES	9.9	2.7	0.0	0.0
26-04-2024	9	30.6	76.3	270.0	W	3.6	1.0	0.0	0.0
26-04-2024	10	32.0	73.6	45.0	NE	10.8	3.0	0.0	0.0
26-04-2024	11	34.0	72.2	315.0	NW	11.7	3.3	0.0	0.0
26-04-2024	12	36.4	70.6	315.0	NW	14.4	4.0	0.0	0.0
26-04-2024	13	38.0	68.6	315.0	NW	16.2	4.5	0.0	0.0
26-04-2024	14	39.5	66.4	69.0	ENE	3.6	1.0	0.0	0.0
26-04-2024	15	40.1	63.6	315.0	NW	14.4	4.0	0.0	0.0
26-04-2024	16	40.2	62.2	315.0	NW	18.0	5.0	0.0	0.0
26-04-2024	17	40.0	59.6	135.0	SE	4.9	1.4	0.0	0.0
26-04-2024	18	39.9	56.7	180.0	S	9.0	2.5	0.0	0.0
26-04-2024	19	37.0	56.0	315.0	NW	7.9	2.2	0.0	0.0
26-04-2024	20	33.5	59.0	270.0	W	2.5	0.7	0.0	0.0
26-04-2024	21	30.5	62.0	327.0	NWN	3.6	1.0	0.0	0.0
26-04-2024	22	29.0	64.0	135.0	SE	1.2	0.3	0.0	0.0
26-04-2024	23	28.0	67.0	327.0	NWN	3.1	0.9	0.0	0.0
26-04-2024	24	26.9	70.0	135.0	SE	1.2	0.3	0.0	0.0
27-04-2024	1	26.6	73.0	135.0	SE	2.2	0.6	0.0	0.0
27-04-2024	2	26.5	73.0	25.0	NNE	3.1	0.9	0.0	0.0
27-04-2024	3	26.3	72.0	180.0	S	3.1	0.9	0.0	0.0
27-04-2024	4	26.4	72.0	180.0	S	1.9	0.5	0.0	0.0
27-04-2024	5	26.8	73.0	330.0	NWN	5.8	1.6	0.0	0.0
27-04-2024	6	27.3	73.0	135.0	SE	4.9	1.4	0.0	0.0
27-04-2024	7	27.8	70.0	336.0	NWN	4.9	1.4	0.0	0.0
27-04-2024	8	28.5	67.0	315.0	NW	3.6	1.0	0.0	0.0
27-04-2024	9	30.0	62.0	315.0	NW	5.6	1.5	0.0	0.0
27-04-2024	10	32.4	58.0	315.0	NW	2.2	0.6	0.0	0.0
27-04-2024	11	34.5	54.0	315.0	NW	2.5	0.7	0.0	0.0
27-04-2024	12	36.0	53.0	315.0	NW	2.9	0.8	0.0	0.0
27-04-2024	13	37.5	51.0	315.0	NW	8.0	2.2	0.0	0.0
27-04-2024	14	38.5	50.0	315.0	NW	2.2	0.6	0.0	0.0
27-04-2024	15	39.4	48.0	315.0	NW	8.6	2.4	0.0	0.0
27-04-2024	16	39.5	48.0	315.0	NW	2.5	0.7	0.0	0.0
27-04-2024	17	39.5	48.0	270.0	W	9.9	2.7	0.0	0.0
27-04-2024	18	37.9	52.0	294.0	WNW	3.6	1.0	0.0	0.0
27-04-2024	19	35.5	55.0	180.0	S	1.8	0.5	0.0	0.0
27-04-2024	20	32.0	58.0	301.0	WNW	4.0	1.1	0.0	0.0
27-04-2024	21	29.5	61.0	270.0	W	3.6	1.0	0.0	0.0
27-04-2024	22	28.7	67.0	270.0	W	4.3	1.2	0.0	0.0
27-04-2024	23	28.3	67.0	135.0	SE	1.9	0.5	0.0	0.0
27-04-2024	24	27.4	70.0	135.0	SE	1.9	0.5	0.0	0.0
28-04-2024	1	27.3	70.0	180.0	S	3.6	1.0	0.0	0.0
28-04-2024	2	26.8	73.0	360.0	N	0.6	0.2	0.0	0.0
28-04-2024	3	26.6	74.5	315.0	NW	4.3	1.2	0.0	0.0
28-04-2024	4	26.7	76.4	225.0	SW	4.7	1.3	0.0	0.0
28-04-2024	5	27.2	77.2	135.0	SE	3.6	1.0	0.0	0.0
28-04-2024	6	27.6	77.8	135.0	SE	10.8	3.0	0.0	0.0
28-04-2024	7	28.2	78.4	135.0	SE	1.9	0.5	0.0	0.0
28-04-2024	8	29.3	79.0	135.0	SE	10.8	3.0	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
28-04-2024	9	29.9	77.3	315.0	NW	14.4	4.0	0.0	0.0
28-04-2024	10	31.6	74.2	315.0	NW	14.4	4.0	0.0	0.0
28-04-2024	11	34.0	72.2	315.0	NW	10.8	3.0	0.0	0.0
28-04-2024	12	36.4	69.5	315.0	NW	7.9	2.2	0.0	0.0
28-04-2024	13	38.0	67.3	315.0	NW	19.1	5.3	0.0	0.0
28-04-2024	14	39.0	64.3	270.0	W	14.4	4.0	0.0	0.0
28-04-2024	15	39.4	62.2	240.0	WSW	14.4	4.0	0.0	0.0
28-04-2024	16	39.8	59.2	315.0	NW	14.4	4.0	0.0	0.0
28-04-2024	17	40.3	57.2	315.0	NW	9.3	2.6	0.0	0.0
28-04-2024	18	39.6	56.6	345.0	NWN	10.8	3.0	0.0	0.0
28-04-2024	19	37.3	56.0	346.0	NWN	2.2	0.6	0.0	0.0
28-04-2024	20	34.6	59.0	135.0	SE	5.6	1.5	0.0	0.0
28-04-2024	21	32.3	64.0	135.0	SE	10.8	3.0	0.0	0.0
28-04-2024	22	29.7	68.0	270.0	W	1.2	0.3	0.0	0.0
28-04-2024	23	28.1	70.0	45.0	NE	3.7	1.0	0.0	0.0
28-04-2024	24	26.8	73.0	315.0	NW	15.1	4.2	0.0	0.0
29-04-2024	1	26.6	73.0	315.0	NW	13.0	3.6	0.0	0.0
29-04-2024	2	26.4	73.0	45.0	NE	3.1	0.9	0.0	0.0
29-04-2024	3	26.7	73.0	45.0	NE	5.0	1.4	0.0	0.0
29-04-2024	4	27.1	70.0	45.0	NE	4.3	1.2	0.0	0.0
29-04-2024	5	27.7	70.0	135.0	SE	3.7	1.0	0.0	0.0
29-04-2024	6	28.1	70.0	135.0	SE	10.8	3.0	0.0	0.0
29-04-2024	7	28.7	67.0	135.0	SE	4.0	1.1	0.0	0.0
29-04-2024	8	29.3	64.0	135.0	SE	4.3	1.2	0.0	0.0
29-04-2024	9	30.2	62.0	315.0	NW	3.1	0.9	0.0	0.0
29-04-2024	10	31.8	61.0	315.0	NW	9.0	2.5	0.0	0.0
29-04-2024	11	34.3	56.0	315.0	NW	13.0	3.6	0.0	0.0
29-04-2024	12	36.1	53.0	315.0	NW	14.0	3.9	0.0	0.0
29-04-2024	13	37.7	52.0	315.0	NW	14.4	4.0	0.0	0.0
29-04-2024	14	38.4	51.0	315.0	NW	14.4	4.0	0.0	0.0
29-04-2024	15	39.2	50.0	315.0	NW	19.1	5.3	0.0	0.0
29-04-2024	16	39.7	50.0	315.0	NW	4.3	1.2	0.0	0.0
29-04-2024	17	40.3	50.0	315.0	NW	7.9	2.2	0.0	0.0
29-04-2024	18	39.2	53.0	135.0	SE	10.8	3.0	0.0	0.0
29-04-2024	19	38.3	58.0	135.0	SE	3.6	1.0	0.0	0.0
29-04-2024	20	37.0	62.0	315.0	NW	2.5	0.7	0.0	0.0
29-04-2024	21	33.5	65.0	45.0	NE	1.8	0.5	0.0	0.0
29-04-2024	22	31.1	69.0	327.0	NWN	1.8	0.5	0.0	0.0
29-04-2024	23	28.4	70.0	135.0	SE	1.2	0.3	0.0	0.0
30-04-2024	24	27.0	72.0	328.0	NWN	5.4	1.5	0.0	0.0
30-04-2024	1	26.5	73.0	328.0	NWN	3.1	0.9	0.0	0.0
30-04-2024	2	26.0	74.5	242.0	WSW	1.8	0.5	0.0	0.0
30-04-2024	3	25.5	76.0	242.0	WSW	2.2	0.6	0.0	0.0
30-04-2024	4	25.8	77.2	135.0	SE	10.8	3.0	0.0	0.0
30-04-2024	5	26.4	78.3	328.0	NWN	7.9	2.2	0.0	0.0
30-04-2024	6	26.8	78.8	135.0	SE	7.2	2.0	0.0	0.0
30-04-2024	7	28.0	79.3	120.0	ESE	4.0	1.1	0.0	0.0
30-04-2024	8	29.8	79.7	17.0	NNE	8.6	2.4	0.0	0.0
30-04-2024	9	31.1	78.7	315.0	NW	2.9	0.8	0.0	0.0
30-04-2024	10	33.5	76.3	315.0	NW	10.8	3.0	0.0	0.0
30-04-2024	11	35.9	73.2	315.0	NW	11.7	3.3	0.0	0.0
30-04-2024	12	37.5	69.7	315.0	NW	8.6	2.4	0.0	0.0
30-04-2024	13	38.5	66.4	255.0	WSW	14.4	4.0	0.0	0.0
30-04-2024	14	39.2	63.3	135.0	SE	10.8	3.0	0.0	0.0
30-04-2024	15	39.7	59.2	315.0	NW	14.4	4.0	0.0	0.0
30-04-2024	16	40.2	56.6	315.0	NW	3.6	1.0	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
30-04-2024	17	40.6	53.4	315.0	NW	10.8	3.0	0.0	0.0
30-04-2024	18	39.4	52.3	329.0	NWN	3.6	1.0	0.0	0.0
30-04-2024	19	38.6	54.0	213.0	SSW	10.8	3.0	0.0	0.0
30-04-2024	20	35.7	57.0	270.0	W	3.6	1.0	0.0	0.0
30-04-2024	21	33.2	62.0	270.0	W	3.1	0.9	0.0	0.0
30-04-2024	22	30.7	65.0	270.0	W	2.5	0.7	0.0	0.0
30-04-2024	23	28.2	68.0	315.0	NW	3.7	1.0	0.0	0.0
30-04-2024	24	26.6	71.0	287.0	WNW	3.6	1.0	0.0	0.0
01-05-2024	1	26.4	72.4	315.0	NW	3.3	0.9	0.0	0.0
01-05-2024	2	26.0	74.3	315.0	NW	8.3	2.3	0.0	0.0
01-05-2024	3	25.8	75.6	135.0	SE	1.6	0.4	0.0	0.0
01-05-2024	4	26.2	77.4	135.0	SE	7.2	2.0	0.0	0.0
01-05-2024	5	26.9	78.5	135.0	SE	14.4	4.0	0.0	0.0
01-05-2024	6	27.8	79.2	135.0	SE	11.5	3.2	0.0	0.0
01-05-2024	7	28.6	77.3	135.0	SE	7.9	2.2	0.0	0.0
01-05-2024	8	29.7	73.2	225.0	SW	16.2	4.5	0.0	0.0
01-05-2024	9	31.2	71.1	45.0	NE	11.8	3.3	0.0	0.0
01-05-2024	10	33.2	68.6	45.0	NE	14.4	4.0	0.0	0.0
01-05-2024	11	34.8	65.4	45.0	NE	18.0	5.0	0.0	0.0
01-05-2024	12	36.6	62.3	195.0	SSW	15.1	4.2	0.0	0.0
01-05-2024	13	38.1	59.4	270.0	W	20.2	5.6	0.0	0.0
01-05-2024	14	38.8	56.4	270.0	W	23.0	6.4	0.0	0.0
01-05-2024	15	39.4	52.3	270.0	W	16.9	4.7	0.0	0.0
01-05-2024	16	39.9	49.7	45.0	NE	13.0	3.6	0.0	0.0
01-05-2024	17	40.2	49.0	45.0	NE	15.8	4.4	0.0	0.0
01-05-2024	18	38.3	52.0	135.0	SE	7.9	2.2	0.0	0.0
01-05-2024	19	36.1	55.5	135.0	SE	3.1	0.9	0.0	0.0
01-05-2024	20	33.3	58.7	328.0	NWN	13.0	3.6	0.0	0.0
01-05-2024	21	30.7	63.2	135.0	SE	4.7	1.3	0.0	0.0
01-05-2024	22	28.2	66.5	135.0	SE	0.8	0.2	0.0	0.0
01-05-2024	23	27.0	69.2	328.0	NWN	9.7	2.7	0.0	0.0
01-05-2024	24	26.5	70.2	135.0	SE	16.9	4.7	0.0	0.0
02-05-2024	1	26.0	71.2	328.0	NWN	7.9	2.2	0.0	0.0
02-05-2024	2	25.9	73.2	135.0	SE	3.1	0.9	0.0	0.0
02-05-2024	3	25.5	74.3	65.0	ENE	13.3	3.7	0.0	0.0
02-05-2024	4	24.6	75.0	327.0	NWN	10.8	3.0	0.0	0.0
02-05-2024	5	24.9	74.0	135.0	SE	14.4	4.0	0.0	0.0
02-05-2024	6	26.4	73.0	135.0	SE	10.8	3.0	0.0	0.0
02-05-2024	7	27.9	72.0	270.0	W	7.6	2.1	0.0	0.0
02-05-2024	8	29.6	71.0	270.0	W	9.4	2.6	0.0	0.0
02-05-2024	9	30.5	70.0	315.0	NW	14.4	4.0	0.0	0.0
02-05-2024	10	32.0	68.5	315.0	NW	18.0	5.0	0.0	0.0
02-05-2024	11	34.1	66.0	315.0	NW	21.6	6.0	0.0	0.0
02-05-2024	12	36.2	65.0	315.0	NW	15.8	4.4	0.0	0.0
02-05-2024	13	37.7	67.0	315.0	NW	18.0	5.0	0.0	0.0
02-05-2024	14	38.3	71.4	315.0	NW	16.6	4.6	0.0	0.0
02-05-2024	15	38.8	68.8	315.0	NW	15.8	4.4	0.0	0.0
02-05-2024	16	39.4	66.6	180.0	S	13.3	3.7	0.0	0.0
02-05-2024	17	39.8	65.4	315.0	NW	20.2	5.6	0.0	0.0
02-05-2024	18	39.2	63.7	315.0	NW	14.9	4.1	0.0	0.0
02-05-2024	19	37.7	62.2	90.0	E	14.4	4.0	0.0	0.0
02-05-2024	20	34.6	60.7	135.0	SE	10.8	3.0	0.0	0.0
02-05-2024	21	31.3	58.6	135.0	SE	9.0	2.5	0.0	0.0
02-05-2024	22	28.7	60.0	328.0	NWN	2.4	0.7	0.0	0.0
02-05-2024	23	27.4	66.0	135.0	SE	8.3	2.3	0.0	0.0
02-05-2024	24	27.0	67.0	135.0	SE	4.7	1.3	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
03-05-2024	1	26.7	69.3	315.0	NW	15.1	4.2	0.0	0.0
03-05-2024	2	26.3	71.2	225.0	SW	7.9	2.2	0.0	0.0
03-05-2024	3	25.9	73.3	315.0	NW	5.5	1.5	0.0	0.0
03-05-2024	4	25.6	74.5	315.0	NW	3.1	0.9	0.0	0.0
03-05-2024	5	27.1	76.2	270.0	W	9.4	2.6	0.0	0.0
03-05-2024	6	28.6	77.3	225.0	SW	3.9	1.1	0.0	0.0
03-05-2024	7	29.5	78.7	180.0	S	13.0	3.6	0.0	0.0
03-05-2024	8	30.6	77.7	360.0	N	9.4	2.6	0.0	0.0
03-05-2024	9	31.9	77.6	120.0	ESE	11.0	3.0	0.0	0.0
03-05-2024	10	34.5	74.6	225.0	SW	15.8	4.4	0.0	0.0
03-05-2024	11	36.6	72.2	315.0	NW	13.0	3.6	0.0	0.0
03-05-2024	12	37.4	70.6	315.0	NW	16.2	4.5	0.0	0.0
03-05-2024	13	38.7	67.6	315.0	NW	13.0	3.6	0.0	0.0
03-05-2024	14	39.4	64.3	135.0	SE	18.7	5.2	0.0	0.0
03-05-2024	15	39.9	62.2	315.0	NW	16.9	4.7	0.0	0.0
03-05-2024	16	40.5	60.6	315.0	NW	8.6	2.4	0.0	0.0
03-05-2024	17	41.1	58.6	315.0	NW	13.3	3.7	0.0	0.0
03-05-2024	18	40.1	56.5	135.0	SE	18.0	5.0	0.0	0.0
03-05-2024	19	37.4	54.7	135.0	SE	15.1	4.2	0.0	0.0
03-05-2024	20	34.7	58.2	135.0	SE	8.3	2.3	0.0	0.0
03-05-2024	21	31.8	61.2	270.0	W	14.4	4.0	0.0	0.0
03-05-2024	22	29.6	63.6	135.0	SE	14.4	4.0	0.0	0.0
03-05-2024	23	28.2	66.3	135.0	SE	15.8	4.4	0.0	0.0
04-05-2024	24	27.3	69.6	315.0	NW	1.8	0.5	0.0	0.0
04-05-2024	1	26.6	71.4	315.0	NW	15.8	4.4	0.0	0.0
04-05-2024	2	26.2	73.2	315.0	NW	1.4	0.4	0.0	0.0
04-05-2024	3	25.7	74.7	135.0	SE	13.3	3.7	0.0	0.0
04-05-2024	4	25.4	76.2	135.0	SE	7.9	2.2	0.0	0.0
04-05-2024	5	25.5	77.6	225.0	SW	13.7	3.8	0.0	0.0
04-05-2024	6	27.6	78.6	225.0	SW	16.2	4.5	0.0	0.0
04-05-2024	7	28.9	78.3	135.0	SE	10.8	3.0	0.0	0.0
04-05-2024	8	30.4	75.6	135.0	SE	14.4	4.0	0.0	0.0
04-05-2024	9	32.5	73.2	315.0	NW	4.3	1.2	0.0	0.0
04-05-2024	10	34.1	71.2	315.0	NW	15.8	4.4	0.0	0.0
04-05-2024	11	36.9	68.7	315.0	NW	16.9	4.7	0.0	0.0
04-05-2024	12	38.9	66.5	315.0	NW	15.8	4.4	0.0	0.0
04-05-2024	13	39.6	64.3	315.0	NW	13.3	3.7	0.0	0.0
04-05-2024	14	39.9	62.3	315.0	NW	19.1	5.3	0.0	0.0
04-05-2024	15	40.6	60.2	315.0	NW	20.2	5.6	0.0	0.0
04-05-2024	16	41.3	58.6	315.0	NW	15.5	4.3	0.0	0.0
04-05-2024	17	42.1	56.4	315.0	NW	16.9	4.7	0.0	0.0
04-05-2024	18	40.3	54.6	225.0	SW	13.3	3.7	0.0	0.0
04-05-2024	19	39.4	56.7	90.0	E	15.8	4.4	0.0	0.0
04-05-2024	20	35.7	59.0	315.0	NW	7.9	2.2	0.0	0.0
04-05-2024	21	32.3	63.2	315.0	NW	7.2	2.0	0.0	0.0
04-05-2024	22	29.6	68.0	328.0	NWN	7.9	2.2	0.0	0.0
04-05-2024	23	27.8	69.0	270.0	W	1.6	0.4	0.0	0.0
04-05-2024	24	27.0	71.0	270.0	W	9.4	2.6	0.0	0.0
05-05-2024	1	26.6	72.2	270.0	W	7.9	2.2	0.0	0.0
05-05-2024	2	26.1	73.0	135.0	SE	10.8	3.0	0.0	0.0
05-05-2024	3	25.8	74.4	270.0	W	14.4	4.0	0.0	0.0
05-05-2024	4	25.5	75.2	135.0	SE	1.6	0.4	0.0	0.0
05-05-2024	5	25.0	76.6	135.0	SE	10.1	2.8	0.0	0.0
05-05-2024	6	25.9	77.8	340.0	NWN	14.4	4.0	0.0	0.0
05-05-2024	7	28.4	78.3	333.0	NWN	8.6	2.4	0.0	0.0
05-05-2024	8	30.0	78.5	135.0	SE	13.0	3.6	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
05-05-2024	9	32.9	78.6	270.0	W	16.2	4.5	0.0	0.0
05-05-2024	10	34.6	74.3	315.0	NW	16.9	4.7	0.0	0.0
05-05-2024	11	35.6	71.1	289.0	WNW	14.8	4.1	0.0	0.0
05-05-2024	12	37.2	68.6	315.0	NW	18.7	5.2	0.0	0.0
05-05-2024	13	38.4	65.4	315.0	NW	20.5	5.7	0.0	0.0
05-05-2024	14	39.3	62.2	315.0	NW	16.6	4.6	0.0	0.0
05-05-2024	15	40.4	59.3	225.0	SW	19.8	5.5	0.0	0.0
05-05-2024	16	41.2	55.6	90.0	E	16.9	4.7	0.0	0.0
05-05-2024	17	42.1	52.2	315.0	NW	18.0	5.0	0.0	0.0
05-05-2024	18	40.7	53.0	270.0	W	18.0	5.0	0.0	0.0
05-05-2024	19	37.7	57.0	90.0	E	14.4	4.0	0.0	0.0
05-05-2024	20	35.6	59.0	45.0	NE	13.0	3.6	0.0	0.0
05-05-2024	21	32.6	65.0	45.0	NE	14.4	4.0	0.0	0.0
05-05-2024	22	30.4	68.0	270.0	W	2.4	0.7	0.0	0.0
05-05-2024	23	28.5	69.0	240.0	WSW	4.7	1.3	0.0	0.0
05-05-2024	24	27.6	71.0	255.0	WSW	13.0	3.6	0.0	0.0
06-05-2024	1	27.0	70.0	270.0	W	18.0	5.0	0.0	0.0
06-05-2024	2	27.2	70.0	65.0	ENE	7.9	2.2	0.0	0.0
06-05-2024	3	27.5	69.0	115.0	ESE	15.8	4.4	0.0	0.0
06-05-2024	4	28.3	68.0	225.0	SW	13.7	3.8	0.0	0.0
06-05-2024	5	28.8	68.0	315.0	NW	10.8	3.0	0.0	0.0
06-05-2024	6	29.4	64.0	315.0	NW	14.4	4.0	0.0	0.0
06-05-2024	7	30.2	62.0	315.0	NW	9.4	2.6	0.0	0.0
06-05-2024	8	31.3	60.0	327.0	NWN	11.9	3.3	0.0	0.0
06-05-2024	9	32.5	58.0	315.0	NW	11.0	3.0	0.0	0.0
06-05-2024	10	34.9	55.0	315.0	NW	15.5	4.3	0.0	0.0
06-05-2024	11	37.0	54.0	315.0	NW	15.1	4.2	0.0	0.0
06-05-2024	12	38.6	52.0	315.0	NW	14.4	4.0	0.0	0.0
06-05-2024	13	39.5	53.0	315.0	NW	13.3	3.7	0.0	0.0
06-05-2024	14	40.6	51.0	315.0	NW	15.1	4.2	0.0	0.0
06-05-2024	15	41.0	50.0	315.0	NW	18.0	5.0	0.0	0.0
06-05-2024	16	41.1	50.0	315.0	NW	17.3	4.8	0.0	0.0
06-05-2024	17	40.5	49.0	315.0	NW	20.2	5.6	0.0	0.0
06-05-2024	18	38.0	52.0	270.0	W	16.9	4.7	0.0	0.0
06-05-2024	19	36.0	55.0	270.0	W	13.3	3.7	0.0	0.0
06-05-2024	20	33.5	59.0	116.0	ESE	15.1	4.2	0.0	0.0
06-05-2024	21	30.1	62.0	225.0	SW	1.6	0.4	0.0	0.0
06-05-2024	22	28.6	67.0	225.0	SW	3.6	1.0	0.0	0.0
06-05-2024	23	27.1	69.0	225.0	SW	10.8	3.0	0.0	0.0
06-05-2024	24	26.5	70.0	225.0	SW	0.8	0.2	0.0	0.0
07-05-2024	1	26.0	71.0	225.0	SW	14.4	4.0	0.0	0.0
07-05-2024	2	25.5	71.0	155.0	SES	3.1	0.9	0.0	0.0
07-05-2024	3	25.2	70.0	165.0	SES	7.9	2.2	0.0	0.0
07-05-2024	4	25.0	69.0	45.0	NE	13.3	3.7	0.0	0.0
07-05-2024	5	25.1	68.0	315.0	NW	13.0	3.6	0.0	0.0
07-05-2024	6	26.4	66.0	270.0	W	15.5	4.3	0.0	0.0
07-05-2024	7	27.9	60.0	270.0	W	18.0	5.0	0.0	0.0
07-05-2024	8	29.6	58.0	328.0	NWN	8.6	2.4	0.0	0.0
07-05-2024	9	31.2	57.0	315.0	NW	14.4	4.0	0.0	0.0
07-05-2024	10	33.5	53.0	315.0	NW	13.0	3.6	0.0	0.0
07-05-2024	11	35.6	52.0	290.0	WNW	16.2	4.5	0.0	0.0
07-05-2024	12	37.9	52.0	135.0	SE	19.8	5.5	0.0	0.0
07-05-2024	13	39.5	53.0	15.0	NNE	15.8	4.4	0.0	0.0
07-05-2024	14	40.1	51.0	20.0	NNE	23.8	6.6	0.0	0.0
07-05-2024	15	41.2	50.0	315.0	NW	18.0	5.0	0.0	0.0
07-05-2024	16	42.7	50.0	315.0	NW	14.4	4.0	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
07-05-2024	17	42.2	50.0	270.0	W	15.1	4.2	0.0	0.0
07-05-2024	18	40.0	53.0	328.0	NWN	14.4	4.0	0.0	0.0
07-05-2024	19	37.5	56.0	135.0	SE	14.4	4.0	0.0	0.0
07-05-2024	20	34.5	59.0	329.0	NWN	11.8	3.3	0.0	0.0
07-05-2024	21	31.0	63.0	225.0	SW	7.8	2.2	0.0	0.0
07-05-2024	22	29.0	68.0	328.0	NWN	16.2	4.5	0.0	0.0
07-05-2024	23	27.5	69.0	135.0	SE	5.0	1.4	0.0	0.0
07-05-2024	24	26.9	70.0	327.0	NWN	1.6	0.4	0.0	0.0
08-05-2024	1	26.6	71.0	270.0	W	3.9	1.1	0.0	0.0
08-05-2024	2	26.2	72.0	328.0	NWN	9.4	2.6	0.0	0.0
08-05-2024	3	25.9	73.4	135.0	SE	11.9	3.3	0.0	0.0
08-05-2024	4	25.6	74.0	135.0	SE	9.7	2.7	0.0	0.0
08-05-2024	5	25.6	76.3	135.0	SE	16.9	4.7	0.0	0.0
08-05-2024	6	27.1	75.0	135.0	SE	11.9	3.3	0.0	0.0
08-05-2024	7	28.4	73.2	135.0	SE	5.5	1.5	0.0	0.0
08-05-2024	8	29.9	71.1	90.0	E	12.5	3.5	0.0	0.0
08-05-2024	9	31.2	68.6	25.0	NNE	3.1	0.9	0.0	0.0
08-05-2024	10	32.9	65.6	180.0	S	7.9	2.2	0.0	0.0
08-05-2024	11	35.0	63.7	180.0	S	14.9	4.1	0.0	0.0
08-05-2024	12	36.9	62.4	180.0	S	10.2	2.8	0.0	0.0
08-05-2024	13	38.6	61.2	360.0	N	11.0	3.0	0.0	0.0
08-05-2024	14	39.2	58.9	210.0	SSW	9.4	2.6	0.0	0.0
08-05-2024	15	39.4	58.2	315.0	NW	16.9	4.7	0.0	0.0
08-05-2024	16	39.5	56.3	315.0	NW	8.6	2.4	0.0	0.0
08-05-2024	17	39.5	54.2	315.0	NW	14.4	4.0	0.0	0.0
08-05-2024	18	39.0	53.0	328.0	NWN	13.3	3.7	0.0	0.0
08-05-2024	19	37.0	56.0	135.0	SE	18.0	5.0	0.0	0.0
08-05-2024	20	34.0	59.0	290.0	WNW	7.9	2.2	0.0	0.0
08-05-2024	21	31.6	64.0	135.0	SE	14.8	4.1	0.0	0.0
08-05-2024	22	29.2	68.0	315.0	NW	12.2	3.4	0.0	0.0
08-05-2024	23	27.6	69.0	328.0	NWN	11.2	3.1	0.0	0.0
08-05-2024	24	26.6	71.0	135.0	SE	1.6	0.4	0.0	0.0
09-05-2024	1	26.2	73.0	135.0	SE	9.4	2.6	0.0	0.0
09-05-2024	2	25.6	74.5	270.0	W	3.9	1.1	0.0	0.0
09-05-2024	3	25.1	75.2	242.0	WSW	11.9	3.3	0.0	0.0
09-05-2024	4	24.9	73.1	270.0	W	9.7	2.7	0.0	0.0
09-05-2024	5	25.2	71.3	135.0	SE	7.9	2.2	0.0	0.0
09-05-2024	6	26.5	69.3	135.0	SE	13.3	3.7	0.0	0.0
09-05-2024	7	27.9	66.0	301.0	WNW	9.0	2.5	0.0	0.0
09-05-2024	8	29.5	63.1	135.0	SE	2.5	0.7	0.0	0.0
09-05-2024	9	30.6	61.2	315.0	NW	6.1	1.7	0.0	0.0
09-05-2024	10	33.2	58.6	20.0	NNE	15.6	4.3	0.0	0.0
09-05-2024	11	35.9	54.4	115.0	ESE	12.2	3.4	0.0	0.0
09-05-2024	12	37.7	52.0	225.0	SW	9.4	2.6	0.0	0.0
09-05-2024	13	39.2	53.0	315.0	NW	15.1	4.2	0.0	0.0
09-05-2024	14	39.8	53.0	315.0	NW	16.9	4.7	0.0	0.0
09-05-2024	15	40.4	50.0	315.0	NW	19.8	5.5	0.0	0.0
09-05-2024	16	41.3	49.0	315.0	NW	18.0	5.0	0.0	0.0
09-05-2024	17	41.8	50.0	315.0	NW	23.8	6.6	0.0	0.0
09-05-2024	18	40.1	53.0	238.0	WSW	19.1	5.3	0.0	0.0
09-05-2024	19	38.4	57.0	180.0	S	15.1	4.2	0.0	0.0
09-05-2024	20	36.1	61.0	330.0	NWN	1.6	0.4	0.0	0.0
09-05-2024	21	33.7	62.0	270.0	W	8.6	2.4	0.0	0.0
09-05-2024	22	31.2	66.0	135.0	SE	20.2	5.6	0.0	0.0
09-05-2024	23	28.5	67.0	135.0	SE	13.7	3.8	0.0	0.0
09-05-2024	24	27.4	70.0	330.0	NWN	9.7	2.7	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
10-05-2024	1	27.1	72.1	315.0	NW	2.2	0.6	0.0	0.0
10-05-2024	2	26.9	74.5	285.0	WNW	5.4	1.5	0.0	0.0
10-05-2024	3	26.5	76.7	315.0	NW	1.6	0.4	0.0	0.0
10-05-2024	4	26.2	73.2	315.0	NW	8.3	2.3	0.0	0.0
10-05-2024	5	26.1	71.0	135.0	SE	11.9	3.3	0.0	0.0
10-05-2024	6	27.2	68.7	135.0	SE	7.9	2.2	0.0	0.0
10-05-2024	7	28.5	64.5	270.0	W	2.9	0.8	0.0	0.0
10-05-2024	8	29.6	61.4	270.0	W	13.3	3.7	0.0	0.0
10-05-2024	9	31.4	58.6	315.0	NW	13.0	3.6	0.0	0.0
10-05-2024	10	34.1	56.5	315.0	NW	8.6	2.4	0.0	0.0
10-05-2024	11	36.3	54.5	315.0	NW	9.4	2.6	0.0	0.0
10-05-2024	12	37.8	52.1	315.0	NW	14.1	3.9	0.0	0.0
10-05-2024	13	39.6	50.9	315.0	NW	18.0	5.0	0.0	0.0
10-05-2024	14	41.1	49.5	315.0	NW	16.9	4.7	0.0	0.0
10-05-2024	15	41.8	48.6	315.0	NW	8.3	2.3	0.0	0.0
10-05-2024	16	42.2	48.2	270.0	W	16.2	4.5	0.0	0.0
10-05-2024	17	41.6	47.7	315.0	NW	7.9	2.2	0.0	0.0
10-05-2024	18	39.1	48.8	315.0	NW	14.4	4.0	0.0	0.0
10-05-2024	19	37.5	50.0	135.0	SE	14.4	4.0	0.0	0.0
10-05-2024	20	34.1	55.0	135.0	SE	8.6	2.4	0.0	0.0
10-05-2024	21	31.6	58.0	315.0	NW	10.8	3.0	0.0	0.0
10-05-2024	22	29.1	63.0	315.0	NW	1.6	0.4	0.0	0.0
10-05-2024	23	28.0	66.0	289.0	WNW	3.6	1.0	0.0	0.0
10-05-2024	24	26.8	68.0	225.0	SW	3.6	1.0	0.0	0.0
11-05-2024	1	26.6	69.0	270.0	W	8.6	2.4	0.0	0.0
11-05-2024	2	26.1	70.0	135.0	SE	14.4	4.0	0.0	0.0
11-05-2024	3	25.9	70.0	135.0	SE	3.6	1.0	0.0	0.0
11-05-2024	4	25.5	69.0	270.0	W	3.6	1.0	0.0	0.0
11-05-2024	5	25.6	68.0	135.0	SE	7.9	2.2	0.0	0.0
11-05-2024	6	26.9	66.0	270.0	W	12.6	3.5	0.0	0.0
11-05-2024	7	28.4	60.0	303.0	WNW	14.4	4.0	0.0	0.0
11-05-2024	8	29.9	59.0	135.0	SE	4.0	1.1	0.0	0.0
11-05-2024	9	31.4	57.0	135.0	SE	12.9	3.6	0.0	0.0
11-05-2024	10	33.9	54.0	135.0	SE	14.9	4.1	0.0	0.0
11-05-2024	11	36.5	53.0	327.0	NWN	13.3	3.7	0.0	0.0
11-05-2024	12	38.1	52.0	290.0	WNW	15.1	4.2	0.0	0.0
11-05-2024	13	39.4	53.0	315.0	NW	16.2	4.5	0.0	0.0
11-05-2024	14	40.0	51.0	315.0	NW	18.0	5.0	0.0	0.0
11-05-2024	15	40.9	50.0	315.0	NW	14.4	4.0	0.0	0.0
11-05-2024	16	41.0	50.0	270.0	W	14.4	4.0	0.0	0.0
11-05-2024	17	41.0	50.0	315.0	NW	18.0	5.0	0.0	0.0
11-05-2024	18	39.1	53.0	135.0	SE	17.2	4.8	0.0	0.0
11-05-2024	19	36.9	56.0	135.0	SE	14.8	4.1	0.0	0.0
11-05-2024	20	34.5	59.0	327.0	NWN	11.5	3.2	0.0	0.0
11-05-2024	21	31.0	63.0	328.0	NWN	1.6	0.4	0.0	0.0
11-05-2024	22	29.5	68.0	344.0	NWN	8.6	2.4	0.0	0.0
11-05-2024	23	28.4	69.0	345.0	NWN	13.3	3.7	0.0	0.0
11-05-2024	24	27.6	70.0	135.0	SE	3.6	1.0	0.0	0.0
12-05-2024	1	27.2	70.0	135.0	SE	7.9	2.2	0.0	0.0
12-05-2024	2	26.9	71.0	270.0	W	11.5	3.2	0.0	0.0
12-05-2024	3	26.5	72.0	270.0	W	1.6	0.4	0.0	0.0
12-05-2024	4	26.1	74.4	135.0	SE	8.6	2.4	0.0	0.0
12-05-2024	5	26.2	76.2	135.0	SE	10.8	3.0	0.0	0.0
12-05-2024	6	27.4	77.3	330.0	NWN	11.9	3.3	0.0	0.0
12-05-2024	7	29.0	78.7	345.0	NWN	11.5	3.2	0.0	0.0
12-05-2024	8	30.1	78.2	135.0	SE	8.6	2.4	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
12-05-2024	9	32.0	75.6	315.0	NW	11.8	3.3	0.0	0.0
12-05-2024	10	33.7	71.2	315.0	NW	15.8	4.4	0.0	0.0
12-05-2024	11	35.1	68.6	315.0	NW	19.8	5.5	0.0	0.0
12-05-2024	12	36.5	64.3	315.0	NW	17.0	4.7	0.0	0.0
12-05-2024	13	37.3	61.2	315.0	NW	18.0	5.0	0.0	0.0
12-05-2024	14	38.4	59.0	315.0	NW	21.6	6.0	0.0	0.0
12-05-2024	15	39.7	59.0	315.0	NW	18.7	5.2	0.0	0.0
12-05-2024	16	40.4	62.5	315.0	NW	13.3	3.7	0.0	0.0
12-05-2024	17	41.0	64.0	315.0	NW	13.3	3.7	0.0	0.0
12-05-2024	18	39.0	65.5	135.0	SE	7.8	2.2	0.0	0.0
12-05-2024	19	36.5	66.7	328.0	NWN	14.4	4.0	0.0	0.0
12-05-2024	20	34.0	67.4	330.0	NWN	8.3	2.3	0.0	0.0
12-05-2024	21	31.2	68.2	315.0	NW	1.6	0.4	0.0	0.0
12-05-2024	22	29.0	69.4	135.0	SE	11.8	3.3	0.0	0.0
12-05-2024	23	27.5	70.2	328.0	NWN	3.9	1.1	0.0	0.0
12-05-2024	24	27.0	70.7	315.0	NW	14.4	4.0	0.0	0.0
13-05-2024	1	26.6	71.0	31.0	NNE	1.6	0.4	0.0	0.0
13-05-2024	2	26.4	72.2	31.0	NNE	1.8	0.5	0.0	0.0
13-05-2024	3	26.5	73.0	315.0	NW	9.0	2.5	0.0	0.0
13-05-2024	4	26.7	71.1	135.0	SE	0.8	0.2	0.0	0.0
13-05-2024	5	27.2	69.3	135.0	SE	8.6	2.4	0.0	0.0
13-05-2024	6	27.7	67.7	135.0	SE	14.4	4.0	0.0	0.0
13-05-2024	7	28.4	66.6	135.0	SE	10.8	3.0	0.0	0.0
13-05-2024	8	29.6	64.0	135.0	SE	14.4	4.0	0.0	0.0
13-05-2024	9	31.1	63.0	315.0	NW	7.9	2.2	0.0	0.0
13-05-2024	10	33.0	62.0	45.0	NE	4.0	1.1	0.0	0.0
13-05-2024	11	34.4	56.0	315.0	NW	2.5	0.7	0.0	0.0
13-05-2024	12	36.5	55.0	90.0	E	7.9	2.2	0.0	0.0
13-05-2024	13	38.0	54.0	180.0	S	13.3	3.7	0.0	0.0
13-05-2024	14	39.6	53.0	90.0	E	15.1	4.2	0.0	0.0
13-05-2024	15	41.1	51.0	90.0	E	16.2	4.5	0.0	0.0
13-05-2024	16	42.1	50.0	180.0	S	18.7	5.2	0.0	0.0
13-05-2024	17	42.8	50.0	180.0	S	16.6	4.6	0.0	0.0
13-05-2024	18	39.6	53.0	45.0	NE	13.0	3.6	0.0	0.0
13-05-2024	19	37.4	56.0	45.0	NE	11.9	3.3	0.0	0.0
13-05-2024	20	34.5	59.0	23.0	NNE	0.9	0.3	0.0	0.0
13-05-2024	21	31.0	63.0	360.0	N	12.6	3.5	0.0	0.0
13-05-2024	22	29.0	68.0	120.0	ESE	11.5	3.2	0.0	0.0
13-05-2024	23	27.5	66.0	315.0	NW	12.6	3.5	0.0	0.0
13-05-2024	24	26.8	69.0	225.0	SW	1.8	0.5	0.0	0.0
14-05-2024	1	26.5	70.0	225.0	SW	3.6	1.0	0.0	0.0
14-05-2024	2	26.1	71.0	315.0	NW	14.4	4.0	0.0	0.0
14-05-2024	3	25.6	71.0	315.0	NW	9.0	2.5	0.0	0.0
14-05-2024	4	25.4	69.0	315.0	NW	12.6	3.5	0.0	0.0
14-05-2024	5	25.5	68.0	315.0	NW	20.5	5.7	0.0	0.0
14-05-2024	6	26.6	66.0	156.0	SES	16.9	4.7	0.0	0.0
14-05-2024	7	27.9	60.0	45.0	NE	8.3	2.3	0.0	0.0
14-05-2024	8	29.5	58.0	315.0	NW	16.2	4.5	0.0	0.0
14-05-2024	9	30.9	57.0	90.0	E	15.1	4.2	0.0	0.0
14-05-2024	10	33.5	53.0	45.0	NE	9.0	2.5	0.0	0.0
14-05-2024	11	36.0	53.0	270.0	W	14.4	4.0	0.0	0.0
14-05-2024	12	37.9	55.0	315.0	NW	20.2	5.6	0.0	0.0
14-05-2024	13	39.5	57.0	315.0	NW	18.0	5.0	0.0	0.0
14-05-2024	14	40.7	59.0	225.0	SW	17.6	4.9	0.0	0.0
14-05-2024	15	41.8	61.0	225.0	SW	18.0	5.0	0.0	0.0
14-05-2024	16	42.6	64.0	315.0	NW	14.4	4.0	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
14-05-2024	17	43.1	66.0	225.0	SW	7.8	2.2	0.0	0.0
14-05-2024	18	40.6	67.0	135.0	SE	8.3	2.3	0.0	0.0
14-05-2024	19	38.4	69.0	135.0	SE	11.9	3.3	0.0	0.0
14-05-2024	20	35.5	70.1	270.0	W	14.4	4.0	0.0	0.0
14-05-2024	21	32.0	70.7	225.0	SW	14.4	4.0	0.0	0.0
14-05-2024	22	29.0	71.4	121.0	ESE	1.6	0.4	0.0	0.0
14-05-2024	23	27.6	72.2	45.0	NE	8.6	2.4	0.0	0.0
14-05-2024	24	27.2	73.2	315.0	NW	12.6	3.5	0.0	0.0
15-05-2024	1	27.0	71.4	327.0	NWN	9.4	2.6	0.0	0.0
15-05-2024	2	26.8	70.6	135.0	SE	3.9	1.1	0.0	0.0
15-05-2024	3	26.7	69.5	135.0	SE	10.6	2.9	0.0	0.0
15-05-2024	4	27.1	72.0	135.0	SE	4.2	1.2	0.0	0.0
15-05-2024	5	27.6	73.0	315.0	NW	15.3	4.3	0.0	0.0
15-05-2024	6	28.3	74.0	210.0	SSW	4.7	1.3	0.0	0.0
15-05-2024	7	29.2	75.0	315.0	NW	14.8	4.1	0.0	0.0
15-05-2024	8	29.8	76.0	135.0	SE	10.0	2.8	0.0	0.0
15-05-2024	9	31.5	77.0	315.0	NW	15.6	4.3	0.0	0.0
15-05-2024	10	32.5	77.6	315.0	NW	13.3	3.7	0.0	0.0
15-05-2024	11	35.0	75.4	315.0	NW	17.0	4.7	0.0	0.0
15-05-2024	12	36.9	73.2	315.0	NW	15.1	4.2	0.0	0.0
15-05-2024	13	38.5	71.0	315.0	NW	7.9	2.2	0.0	0.0
15-05-2024	14	39.6	68.6	270.0	W	15.1	4.2	0.0	0.0
15-05-2024	15	40.5	64.4	315.0	NW	13.3	3.7	0.0	0.0
15-05-2024	16	42.1	61.2	270.0	W	15.1	4.2	0.0	0.0
15-05-2024	17	42.4	58.4	270.0	W	13.3	3.7	0.0	0.0
15-05-2024	18	40.2	56.0	270.0	W	15.1	4.2	0.0	0.0
15-05-2024	19	37.6	56.0	270.0	W	13.3	3.7	0.0	0.0
15-05-2024	20	34.5	59.0	327.0	NWN	7.9	2.2	0.0	0.0
15-05-2024	21	31.0	63.0	135.0	SE	4.7	1.3	0.0	0.0
15-05-2024	22	29.0	68.0	135.0	SE	2.2	0.6	0.0	0.0
15-05-2024	23	28.1	70.0	135.0	SE	15.8	4.4	0.0	0.0
15-05-2024	24	26.9	70.0	135.0	SE	11.9	3.3	0.0	0.0
16-05-2024	1	26.6	70.0	15.0	NNE	10.8	3.0	0.0	0.0
16-05-2024	2	26.0	70.0	16.0	NNE	2.4	0.7	0.0	0.0
16-05-2024	3	25.6	71.0	19.0	NNE	14.4	4.0	0.0	0.0
16-05-2024	4	25.4	70.0	25.0	NNE	13.3	3.7	0.0	0.0
16-05-2024	5	25.5	68.0	270.0	W	14.4	4.0	0.0	0.0
16-05-2024	6	26.9	66.0	45.0	NE	7.9	2.2	0.0	0.0
16-05-2024	7	28.6	60.0	135.0	SE	15.5	4.3	0.0	0.0
16-05-2024	8	30.1	59.0	135.0	SE	16.2	4.5	0.0	0.0
16-05-2024	9	32.2	58.0	315.0	NW	2.2	0.6	0.0	0.0
16-05-2024	10	34.5	54.0	315.0	NW	13.3	3.7	0.0	0.0
16-05-2024	11	36.0	53.0	315.0	NW	7.9	2.2	0.0	0.0
16-05-2024	12	37.5	51.0	90.0	E	15.5	4.3	0.0	0.0
16-05-2024	13	38.9	53.0	290.0	WNW	17.0	4.7	0.0	0.0
16-05-2024	14	39.9	51.0	290.0	WNW	18.0	5.0	0.0	0.0
16-05-2024	15	40.4	49.0	315.0	NW	22.0	6.1	0.0	0.0
16-05-2024	16	41.0	48.0	315.0	NW	24.1	6.7	0.0	0.0
16-05-2024	17	40.6	47.8	315.0	NW	20.9	5.8	0.0	0.0
16-05-2024	18	39.8	49.0	135.0	SE	19.1	5.3	0.0	0.0
16-05-2024	19	37.6	51.0	90.0	E	16.6	4.6	0.0	0.0
16-05-2024	20	35.1	54.0	135.0	SE	14.8	4.1	0.0	0.0
16-05-2024	21	32.0	58.0	329.0	NWN	14.0	3.9	0.0	0.0
16-05-2024	22	30.0	62.0	135.0	SE	11.9	3.3	0.0	0.0
16-05-2024	23	28.5	64.0	270.0	W	14.4	4.0	0.0	0.0
16-05-2024	24	27.6	66.0	303.0	WNW	9.7	2.7	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
17-05-2024	1	27.0	67.5	242.0	WSW	2.4	0.7	0.0	0.0
17-05-2024	2	26.6	69.2	301.0	WNW	11.2	3.1	0.0	0.0
17-05-2024	3	26.4	70.6	135.0	SE	1.6	0.4	0.0	0.0
17-05-2024	4	26.5	71.0	135.0	SE	7.9	2.2	0.0	0.0
17-05-2024	5	27.4	72.0	270.0	W	4.0	1.1	0.0	0.0
17-05-2024	6	28.7	73.0	270.0	W	9.4	2.6	0.0	0.0
17-05-2024	7	28.9	74.0	328.0	NWN	10.8	3.0	0.0	0.0
17-05-2024	8	29.4	71.5	135.0	SE	14.4	4.0	0.0	0.0
17-05-2024	9	31.4	69.6	315.0	NW	5.8	1.6	0.0	0.0
17-05-2024	10	32.6	68.5	315.0	NW	7.9	2.2	0.0	0.0
17-05-2024	11	34.0	66.5	315.0	NW	13.3	3.7	0.0	0.0
17-05-2024	12	35.4	65.5	210.0	SSW	15.1	4.2	0.0	0.0
17-05-2024	13	37.1	64.0	270.0	W	16.9	4.7	0.0	0.0
17-05-2024	14	38.3	63.5	270.0	W	20.2	5.6	0.0	0.0
17-05-2024	15	39.4	62.0	240.0	WSW	16.9	4.7	0.0	0.0
17-05-2024	16	40.6	60.5	315.0	NW	16.9	4.7	0.0	0.0
17-05-2024	17	41.7	62.0	315.0	NW	15.1	4.2	0.0	0.0
17-05-2024	18	40.1	70.6	135.0	SE	13.3	3.7	0.0	0.0
17-05-2024	19	39.0	68.6	90.0	E	11.5	3.2	0.0	0.0
17-05-2024	20	37.1	65.6	225.0	SW	15.8	4.4	0.0	0.0
17-05-2024	21	34.1	64.5	225.0	SW	6.1	1.7	0.0	0.0
17-05-2024	22	31.5	69.0	135.0	SE	1.6	0.4	0.0	0.0
17-05-2024	23	29.4	71.0	135.0	SE	14.4	4.0	0.0	0.0
17-05-2024	24	27.9	71.0	290.0	WNW	10.4	2.9	0.0	0.0
18-05-2024	1	27.7	71.0	288.0	WNW	13.0	3.6	0.0	0.0
18-05-2024	2	27.5	71.0	287.0	WNW	9.0	2.5	0.0	0.0
18-05-2024	3	27.6	71.0	287.0	WNW	11.2	3.1	0.0	0.0
18-05-2024	4	27.9	70.0	289.0	WNW	1.6	0.4	0.0	0.0
18-05-2024	5	28.4	70.0	135.0	SE	9.4	2.6	0.0	0.0
18-05-2024	6	29.6	68.0	135.0	SE	11.2	3.1	0.0	0.0
18-05-2024	7	30.3	65.0	360.0	N	9.0	2.5	0.0	0.0
18-05-2024	8	31.1	63.0	135.0	SE	12.5	3.5	0.0	0.0
18-05-2024	9	32.2	61.0	327.0	NWN	13.3	3.7	0.0	0.0
18-05-2024	10	33.1	59.0	315.0	NW	7.9	2.2	0.0	0.0
18-05-2024	11	34.5	54.0	315.0	NW	13.3	3.7	0.0	0.0
18-05-2024	12	36.0	53.0	315.0	NW	14.4	4.0	0.0	0.0
18-05-2024	13	37.9	52.0	315.0	NW	16.2	4.5	0.0	0.0
18-05-2024	14	39.8	51.0	315.0	NW	13.0	3.6	0.0	0.0
18-05-2024	15	40.5	50.7	315.0	NW	14.4	4.0	0.0	0.0
18-05-2024	16	41.1	52.0	315.0	NW	15.1	4.2	0.0	0.0
18-05-2024	17	41.4	52.0	315.0	NW	13.3	3.7	0.0	0.0
18-05-2024	18	40.2	56.0	345.0	NWN	14.4	4.0	0.0	0.0
18-05-2024	19	38.0	54.0	330.0	NWN	9.7	2.7	0.0	0.0
18-05-2024	20	35.6	55.0	225.0	SW	14.4	4.0	0.0	0.0
18-05-2024	21	32.5	58.0	45.0	NE	15.1	4.2	0.0	0.0
18-05-2024	22	30.0	62.0	315.0	NW	1.6	0.4	0.0	0.0
18-05-2024	23	28.0	70.0	315.0	NW	7.9	2.2	0.0	0.0
18-05-2024	24	26.9	70.0	315.0	NW	14.4	4.0	0.0	0.0
19-05-2024	1	26.6	70.0	290.0	WNW	2.5	0.7	0.0	0.0
19-05-2024	2	26.4	71.0	135.0	SE	3.9	1.1	0.0	0.0
19-05-2024	3	26.1	72.5	135.0	SE	15.8	4.4	0.0	0.0
19-05-2024	4	26.0	74.0	110.0	ESE	2.2	0.6	0.0	0.0
19-05-2024	5	26.4	75.6	115.0	ESE	4.3	1.2	0.0	0.0
19-05-2024	6	27.8	77.0	160.0	SES	13.8	3.8	0.0	0.0
19-05-2024	7	29.4	74.3	155.0	SES	15.1	4.2	0.0	0.0
19-05-2024	8	31.2	72.2	168.0	SES	8.6	2.4	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
19-05-2024	9	33.5	69.4	45.0	NE	15.5	4.3	0.0	0.0
19-05-2024	10	35.0	66.6	270.0	W	7.9	2.2	0.0	0.0
19-05-2024	11	36.9	63.3	240.0	WSW	15.5	4.3	0.0	0.0
19-05-2024	12	38.5	59.2	250.0	WSW	15.1	4.2	0.0	0.0
19-05-2024	13	40.2	56.3	315.0	NW	18.0	5.0	0.0	0.0
19-05-2024	14	41.0	53.2	315.0	NW	16.9	4.7	0.0	0.0
19-05-2024	15	42.5	55.0	315.0	NW	14.0	3.9	0.0	0.0
19-05-2024	16	42.4	55.0	315.0	NW	16.2	4.5	0.0	0.0
19-05-2024	17	42.2	57.0	180.0	S	12.5	3.5	0.0	0.0
19-05-2024	18	40.6	61.0	135.0	SE	15.1	4.2	0.0	0.0
19-05-2024	19	38.0	64.0	90.0	E	18.0	5.0	0.0	0.0
19-05-2024	20	35.0	69.0	238.0	WSW	1.6	0.4	0.0	0.0
19-05-2024	21	31.5	68.0	270.0	W	8.6	2.4	0.0	0.0
19-05-2024	22	29.6	69.0	270.0	W	5.0	1.4	0.0	0.0
19-05-2024	23	28.5	71.0	301.0	WNW	10.8	3.0	0.0	0.0
19-05-2024	24	27.2	70.0	338.0	NWN	9.7	2.7	0.0	0.0
20-05-2024	1	26.6	69.0	270.0	W	10.8	3.0	0.0	0.0
20-05-2024	2	26.0	68.0	135.0	SE	7.9	2.2	0.0	0.0
20-05-2024	3	25.6	70.0	135.0	SE	1.6	0.4	0.0	0.0
20-05-2024	4	25.1	71.0	360.0	N	15.8	4.4	0.0	0.0
20-05-2024	5	25.2	71.0	225.0	SW	16.2	4.5	0.0	0.0
20-05-2024	6	26.6	70.0	168.0	SES	9.4	2.6	0.0	0.0
20-05-2024	7	27.9	69.0	45.0	NE	8.6	2.4	0.0	0.0
20-05-2024	8	29.5	68.0	45.0	NE	11.0	3.0	0.0	0.0
20-05-2024	9	32.4	64.0	315.0	NW	12.6	3.5	0.0	0.0
20-05-2024	10	34.5	59.0	315.0	NW	13.3	3.7	0.0	0.0
20-05-2024	11	36.9	56.0	315.0	NW	8.3	2.3	0.0	0.0
20-05-2024	12	39.1	56.0	90.0	E	16.9	4.7	0.0	0.0
20-05-2024	13	40.4	53.0	315.0	NW	16.2	4.5	0.0	0.0
20-05-2024	14	41.7	52.0	315.0	NW	15.1	4.2	0.0	0.0
20-05-2024	15	42.3	51.0	315.0	NW	18.7	5.2	0.0	0.0
20-05-2024	16	42.7	51.0	315.0	NW	17.6	4.9	0.0	0.0
20-05-2024	17	41.8	51.0	315.0	NW	15.8	4.4	0.0	0.0
20-05-2024	18	39.2	52.0	135.0	SE	11.8	3.3	0.0	0.0
20-05-2024	19	37.8	52.0	45.0	NE	13.3	3.7	0.0	0.0
20-05-2024	20	35.6	55.0	135.0	SE	4.7	1.3	0.0	0.0
20-05-2024	21	32.4	58.0	135.0	SE	7.9	2.2	0.0	0.0
20-05-2024	22	30.8	62.0	135.0	SE	1.6	0.4	0.0	0.0
20-05-2024	23	28.4	64.0	270.0	W	5.8	1.6	0.0	0.0
20-05-2024	24	26.8	66.0	45.0	NE	7.9	2.2	0.0	0.0
21-05-2024	1	25.7	69.0	45.0	NE	10.8	3.0	0.0	0.0
21-05-2024	2	24.4	69.0	256.0	WSW	14.4	4.0	0.0	0.0
21-05-2024	3	23.6	70.0	270.0	W	3.9	1.1	0.0	0.0
21-05-2024	4	23.1	70.0	315.0	NW	1.6	0.4	0.0	0.0
21-05-2024	5	22.2	71.0	315.0	NW	9.0	2.5	0.0	0.0
21-05-2024	6	23.8	71.0	15.0	NNE	13.3	3.7	0.0	0.0
21-05-2024	7	25.4	71.0	180.0	S	9.4	2.6	0.0	0.0
21-05-2024	8	27.8	71.0	315.0	NW	12.5	3.5	0.0	0.0
21-05-2024	9	30.2	66.0	315.0	NW	2.5	0.7	0.0	0.0
21-05-2024	10	32.1	62.0	315.0	NW	11.5	3.2	0.0	0.0
21-05-2024	11	33.8	61.0	315.0	NW	11.2	3.1	0.0	0.0
21-05-2024	12	36.2	58.0	270.0	W	16.6	4.6	0.0	0.0
21-05-2024	13	38.3	53.0	315.0	NW	23.0	6.4	0.0	0.0
21-05-2024	14	39.6	52.2	315.0	NW	20.9	5.8	0.0	0.0
21-05-2024	15	41.1	50.7	315.0	NW	16.6	4.6	0.0	0.0
21-05-2024	16	42.4	53.0	315.0	NW	13.7	3.8	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (^o C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
21-05-2024	17	43.1	56.0	315.0	NW	16.2	4.5	0.0	0.0
21-05-2024	18	40.8	58.0	135.0	SE	18.0	5.0	0.0	0.0
21-05-2024	19	38.3	61.0	289.0	WNW	15.8	4.4	0.0	0.0
21-05-2024	20	35.6	62.0	135.0	SE	15.1	4.2	0.0	0.0
21-05-2024	21	32.2	64.0	315.0	NW	1.6	0.4	0.0	0.0
21-05-2024	22	29.5	65.5	256.0	WSW	14.4	4.0	0.0	0.0
21-05-2024	23	28.0	66.5	255.0	WSW	2.2	0.6	0.0	0.0
21-05-2024	24	26.6	68.5	255.0	WSW	1.6	0.4	0.0	0.0
22-05-2024	1	26.4	69.0	270.0	W	1.4	0.4	0.0	0.0
22-05-2024	2	26.1	70.0	270.0	W	3.9	1.1	0.0	0.0
22-05-2024	3	25.6	71.0	315.0	NW	9.4	2.6	0.0	0.0
22-05-2024	4	25.4	71.7	135.0	SE	12.6	3.5	0.0	0.0
22-05-2024	5	25.5	72.0	303.0	WNW	14.4	4.0	0.0	0.0
22-05-2024	6	26.6	72.6	303.0	WNW	3.2	0.9	0.0	0.0
22-05-2024	7	28.6	73.0	135.0	SE	7.9	2.2	0.0	0.0
22-05-2024	8	30.3	72.7	135.0	SE	16.9	4.7	0.0	0.0
22-05-2024	9	32.1	71.2	315.0	NW	9.7	2.7	0.0	0.0
22-05-2024	10	33.4	68.6	315.0	NW	15.5	4.3	0.0	0.0
22-05-2024	11	35.9	66.5	270.0	W	13.3	3.7	0.0	0.0
22-05-2024	12	38.8	65.0	315.0	NW	18.0	5.0	0.0	0.0
22-05-2024	13	40.5	67.0	290.0	WNW	16.9	4.7	0.0	0.0
22-05-2024	14	41.6	69.3	290.0	WNW	15.1	4.2	0.0	0.0
22-05-2024	15	42.7	67.6	90.0	E	14.4	4.0	0.0	0.0
22-05-2024	16	43.6	63.3	315.0	NW	14.4	4.0	0.0	0.0
22-05-2024	17	44.7	58.6	315.0	NW	18.0	5.0	0.0	0.0
22-05-2024	18	42.1	56.2	135.0	SE	9.4	2.6	0.0	0.0
22-05-2024	19	40.3	54.4	45.0	NE	13.0	3.6	0.0	0.0
22-05-2024	20	37.2	56.0	328.0	NWN	1.6	0.4	0.0	0.0
22-05-2024	21	34.2	60.0	135.0	SE	8.6	2.4	0.0	0.0
22-05-2024	22	31.1	64.0	135.0	SE	10.8	3.0	0.0	0.0
22-05-2024	23	28.7	66.0	270.0	W	10.8	3.0	0.0	0.0
22-05-2024	24	26.4	69.0	135.0	SE	14.4	4.0	0.0	0.0
23-05-2024	1	26.0	71.0	270.0	W	0.8	0.2	0.0	0.0
23-05-2024	2	25.5	72.7	270.0	W	7.9	2.2	0.0	0.0
23-05-2024	3	25.4	74.0	270.0	W	1.6	0.4	0.0	0.0
23-05-2024	4	25.1	75.0	303.0	WNW	13.3	3.7	0.0	0.0
23-05-2024	5	25.2	76.3	303.0	WNW	3.9	1.1	0.0	0.0
23-05-2024	6	26.4	77.2	270.0	W	10.8	3.0	0.0	0.0
23-05-2024	7	27.9	73.8	225.0	SW	14.4	4.0	0.0	0.0
23-05-2024	8	29.5	72.1	292.0	WNW	14.4	4.0	0.0	0.0
23-05-2024	9	31.1	69.6	292.0	WNW	7.9	2.2	0.0	0.0
23-05-2024	10	33.0	66.7	292.0	WNW	14.4	4.0	0.0	0.0
23-05-2024	11	36.2	64.2	225.0	SW	15.8	4.4	0.0	0.0
23-05-2024	12	38.9	61.7	270.0	W	18.0	5.0	0.0	0.0
23-05-2024	13	40.1	59.7	270.0	W	19.8	5.5	0.0	0.0
23-05-2024	14	41.4	57.2	315.0	NW	13.5	3.7	0.0	0.0
23-05-2024	15	42.7	54.5	315.0	NW	7.9	2.2	0.0	0.0
23-05-2024	16	44.2	52.3	315.0	NW	11.5	3.2	0.0	0.0
23-05-2024	17	44.9	51.0	315.0	NW	15.1	4.2	0.0	0.0
23-05-2024	18	42.1	52.0	135.0	SE	9.4	2.6	0.0	0.0
23-05-2024	19	39.4	54.0	135.0	SE	8.6	2.4	0.0	0.0
23-05-2024	20	36.7	55.0	135.0	SE	12.6	3.5	0.0	0.0
23-05-2024	21	33.3	58.0	270.0	W	3.9	1.1	0.0	0.0
23-05-2024	22	30.6	61.0	315.0	NW	1.6	0.4	0.0	0.0
23-05-2024	23	28.1	67.0	315.0	NW	13.3	3.7	0.0	0.0
23-05-2024	24	26.9	70.0	211.0	SSW	9.7	2.7	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
24-05-2024	1	26.6	70.0	45.0	NE	16.9	4.7	0.0	0.0
24-05-2024	2	26.1	70.0	135.0	SE	3.9	1.1	0.0	0.0
24-05-2024	3	25.6	68.0	135.0	SE	1.6	0.4	0.0	0.0
24-05-2024	4	25.4	68.0	135.0	SE	12.6	3.5	0.0	0.0
24-05-2024	5	25.5	68.0	301.0	WNW	11.9	3.3	0.0	0.0
24-05-2024	6	26.9	66.0	135.0	SE	5.5	1.5	0.0	0.0
24-05-2024	7	28.4	64.0	288.0	WNW	14.4	4.0	0.0	0.0
24-05-2024	8	29.9	62.0	180.0	S	14.4	4.0	0.0	0.0
24-05-2024	9	31.4	60.0	284.0	WNW	15.8	4.4	0.0	0.0
24-05-2024	10	33.3	56.0	315.0	NW	18.0	5.0	0.0	0.0
24-05-2024	11	35.2	51.0	315.0	NW	18.0	5.0	0.0	0.0
24-05-2024	12	36.8	48.0	315.0	NW	18.0	5.0	0.0	0.0
24-05-2024	13	38.4	49.0	315.0	NW	18.0	5.0	0.0	0.0
24-05-2024	14	39.6	50.0	315.0	NW	18.0	5.0	0.0	0.0
24-05-2024	15	40.8	49.0	73.0	ENE	24.1	6.7	0.0	0.0
24-05-2024	16	42.1	49.0	315.0	NW	22.7	6.3	0.0	0.0
24-05-2024	17	43.7	49.0	315.0	NW	20.9	5.8	0.0	0.0
24-05-2024	18	42.1	52.0	90.0	E	14.4	4.0	0.0	0.0
24-05-2024	19	39.0	55.0	90.0	E	18.0	5.0	0.0	0.0
24-05-2024	20	36.0	58.0	135.0	SE	10.8	3.0	0.0	0.0
24-05-2024	21	32.5	58.0	135.0	SE	0.8	0.2	0.0	0.0
24-05-2024	22	30.1	62.0	225.0	SW	10.8	3.0	0.0	0.0
24-05-2024	23	28.5	67.0	225.0	SW	8.6	2.4	0.0	0.0
24-05-2024	24	27.1	70.0	315.0	NW	7.9	2.2	0.0	0.0
25-05-2024	1	26.9	70.0	315.0	NW	12.6	3.5	0.0	0.0
25-05-2024	2	26.6	71.4	45.0	NE	2.2	0.6	0.0	0.0
25-05-2024	3	26.1	73.4	156.0	SES	16.9	4.7	0.0	0.0
25-05-2024	4	26.0	75.2	135.0	SE	0.8	0.2	0.0	0.0
25-05-2024	5	25.9	76.0	303.0	WNW	7.2	2.0	0.0	0.0
25-05-2024	6	26.9	77.4	135.0	SE	14.4	4.0	0.0	0.0
25-05-2024	7	27.6	78.2	45.0	NE	12.2	3.4	0.0	0.0
25-05-2024	8	29.5	77.0	315.0	NW	13.3	3.7	0.0	0.0
25-05-2024	9	31.0	75.0	315.0	NW	8.6	2.4	0.0	0.0
25-05-2024	10	33.1	72.0	315.0	NW	15.5	4.3	0.0	0.0
25-05-2024	11	35.2	69.0	315.0	NW	18.0	5.0	0.0	0.0
25-05-2024	12	36.7	68.0	315.0	NW	15.5	4.3	0.0	0.0
25-05-2024	13	38.3	66.0	315.0	NW	13.3	3.7	0.0	0.0
25-05-2024	14	39.2	65.0	315.0	NW	15.8	4.4	0.0	0.0
25-05-2024	15	39.8	67.0	315.0	NW	18.0	5.0	0.0	0.0
25-05-2024	16	41.1	68.0	315.0	NW	21.6	6.0	0.0	0.0
25-05-2024	17	41.7	68.6	270.0	W	16.2	4.5	0.0	0.0
25-05-2024	18	40.8	65.6	270.0	W	19.8	5.5	0.0	0.0
25-05-2024	19	38.2	62.2	270.0	W	12.6	3.5	0.0	0.0
25-05-2024	20	35.5	60.8	270.0	W	9.4	2.6	0.0	0.0
25-05-2024	21	32.1	61.0	180.0	S	7.9	2.2	0.0	0.0
25-05-2024	22	29.8	65.0	270.0	W	2.2	0.6	0.0	0.0
25-05-2024	23	28.1	70.0	270.0	W	16.2	4.5	0.0	0.0
25-05-2024	24	26.8	71.4	135.0	SE	9.7	2.7	0.0	0.0
26-05-2024	1	26.5	73.2	135.0	SE	4.7	1.3	0.0	0.0
26-05-2024	2	26.3	74.4	270.0	W	3.1	0.9	0.0	0.0
26-05-2024	3	26.7	76.4	135.0	SE	1.6	0.4	0.0	0.0
26-05-2024	4	27.1	77.7	327.0	NWN	0.8	0.2	0.0	0.0
26-05-2024	5	27.7	76.0	225.0	SW	9.4	2.6	0.0	0.0
26-05-2024	6	28.1	73.0	327.0	NWN	10.1	2.8	0.0	0.0
26-05-2024	7	28.6	71.0	315.0	NW	14.4	4.0	0.0	0.0
26-05-2024	8	29.7	69.5	315.0	NW	16.2	4.5	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
26-05-2024	9	31.4	67.5	315.0	NW	11.8	3.3	0.0	0.0
26-05-2024	10	33.4	66.0	270.0	W	15.8	4.4	0.0	0.0
26-05-2024	11	36.1	65.0	315.0	NW	13.3	3.7	0.0	0.0
26-05-2024	12	37.6	64.0	315.0	NW	14.4	4.0	0.0	0.0
26-05-2024	13	38.2	74.5	315.0	NW	7.8	2.2	0.0	0.0
26-05-2024	14	39.6	71.2	315.0	NW	12.6	3.5	0.0	0.0
26-05-2024	15	40.4	68.6	315.0	NW	15.1	4.2	0.0	0.0
26-05-2024	16	41.2	64.2	90.0	E	14.4	4.0	0.0	0.0
26-05-2024	17	42.2	61.3	90.0	E	16.6	4.6	0.0	0.0
26-05-2024	18	40.6	58.6	328.0	NWN	14.4	4.0	0.0	0.0
26-05-2024	19	38.8	56.7	135.0	SE	18.0	5.0	0.0	0.0
26-05-2024	20	37.2	59.0	289.0	WNW	9.4	2.6	0.0	0.0
26-05-2024	21	35.3	63.0	135.0	SE	15.5	4.3	0.0	0.0
26-05-2024	22	32.6	67.0	135.0	SE	9.0	2.5	0.0	0.0
26-05-2024	23	29.7	68.0	135.0	SE	9.7	2.7	0.0	0.0
26-05-2024	24	27.8	70.0	328.0	NWN	6.1	1.7	0.0	0.0
27-05-2024	1	27.6	70.0	135.0	SE	9.0	2.5	0.0	0.0
27-05-2024	2	27.4	70.0	135.0	SE	3.1	0.9	0.0	0.0
27-05-2024	3	27.1	70.0	135.0	SE	7.2	2.0	0.0	0.0
27-05-2024	4	27.3	70.0	135.0	SE	9.7	2.7	0.0	0.0
27-05-2024	5	27.7	66.0	135.0	SE	14.4	4.0	0.0	0.0
27-05-2024	6	29.4	64.0	135.0	SE	9.4	2.6	0.0	0.0
27-05-2024	7	31.6	61.0	135.0	SE	10.8	3.0	0.0	0.0
27-05-2024	8	33.8	61.0	135.0	SE	14.4	4.0	0.0	0.0
27-05-2024	9	36.2	59.0	253.0	WSW	18.0	5.0	0.0	0.0
27-05-2024	10	37.9	57.0	315.0	NW	13.3	3.7	0.0	0.0
27-05-2024	11	40.2	53.0	180.0	S	7.9	2.2	0.0	0.0
27-05-2024	12	41.6	52.0	180.0	S	19.1	5.3	0.0	0.0
27-05-2024	13	43.3	51.0	90.0	E	15.1	4.2	0.0	0.0
27-05-2024	14	44.7	50.0	360.0	N	20.2	5.6	0.0	0.0
27-05-2024	15	45.3	48.0	180.0	S	15.8	4.4	0.0	0.0
27-05-2024	16	44.3	48.0	45.0	NE	9.7	2.7	0.0	0.0
27-05-2024	17	41.7	48.0	135.0	SE	13.0	3.6	0.0	0.0
27-05-2024	18	40.9	52.0	225.0	SW	16.9	4.7	0.0	0.0
27-05-2024	19	38.0	54.0	90.0	E	16.9	4.7	0.0	0.0
27-05-2024	20	34.5	59.0	328.0	NWN	5.0	1.4	0.0	0.0
27-05-2024	21	31.5	61.0	135.0	SE	13.3	3.7	0.0	0.0
27-05-2024	22	28.5	64.0	135.0	SE	15.1	4.2	0.0	0.0
27-05-2024	23	27.5	70.0	329.0	NWN	4.7	1.3	0.0	0.0
27-05-2024	24	27.1	70.0	270.0	W	7.9	2.2	0.0	0.0
28-05-2024	1	26.6	71.0	270.0	W	0.8	0.2	0.0	0.0
28-05-2024	2	26.5	71.0	242.0	WSW	5.8	1.6	0.0	0.0
28-05-2024	3	26.1	71.0	270.0	W	11.9	3.3	0.0	0.0
28-05-2024	4	25.9	69.0	135.0	SE	15.1	4.2	0.0	0.0
28-05-2024	5	25.9	69.0	315.0	NW	13.3	3.7	0.0	0.0
28-05-2024	6	26.6	66.0	315.0	NW	15.5	4.3	0.0	0.0
28-05-2024	7	28.1	64.0	135.0	SE	13.3	3.7	0.0	0.0
28-05-2024	8	29.5	58.0	135.0	SE	16.6	4.6	0.0	0.0
28-05-2024	9	31.4	57.0	315.0	NW	13.0	3.6	0.0	0.0
28-05-2024	10	34.0	54.0	270.0	W	15.1	4.2	0.0	0.0
28-05-2024	11	37.0	54.0	315.0	NW	17.6	4.9	0.0	0.0
28-05-2024	12	39.4	55.0	315.0	NW	15.5	4.3	0.0	0.0
28-05-2024	13	40.5	53.0	315.0	NW	15.8	4.4	0.0	0.0
28-05-2024	14	41.6	52.0	315.0	NW	20.2	5.6	0.0	0.0
28-05-2024	15	42.0	50.0	315.0	NW	21.2	5.9	0.0	0.0
28-05-2024	16	42.0	50.0	225.0	SW	19.1	5.3	0.0	0.0

Hourly Meteological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (°C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
28-05-2024	17	41.9	48.0	225.0	SW	16.9	4.7	0.0	0.0
28-05-2024	18	40.1	51.0	330.0	NWN	15.1	4.2	0.0	0.0
28-05-2024	19	37.8	54.0	135.0	SE	13.3	3.7	0.0	0.0
28-05-2024	20	35.4	59.0	135.0	SE	11.9	3.3	0.0	0.0
28-05-2024	21	32.0	61.0	135.0	SE	1.6	0.4	0.0	0.0
28-05-2024	22	29.6	64.0	135.0	SE	9.4	2.6	0.0	0.0
28-05-2024	23	28.1	70.0	135.0	SE	15.1	4.2	0.0	0.0
28-05-2024	24	27.5	71.0	135.0	SE	0.8	0.2	0.0	0.0
29-05-2024	1	27.1	73.2	135.0	SE	13.7	3.8	0.0	0.0
29-05-2024	2	26.8	74.4	135.0	SE	15.8	4.4	0.0	0.0
29-05-2024	3	26.4	75.0	135.0	SE	14.4	4.0	0.0	0.0
29-05-2024	4	26.1	76.0	327.0	NWN	16.9	4.7	0.0	0.0
29-05-2024	5	26.0	77.7	328.0	NWN	7.9	2.2	0.0	0.0
29-05-2024	6	27.1	75.4	135.0	SE	9.0	2.5	0.0	0.0
29-05-2024	7	28.4	73.2	135.0	SE	16.6	4.6	0.0	0.0
29-05-2024	8	29.9	71.6	135.0	SE	12.6	3.5	0.0	0.0
29-05-2024	9	31.5	70.4	315.0	NW	15.8	4.4	0.0	0.0
29-05-2024	10	33.6	67.6	315.0	NW	13.3	3.7	0.0	0.0
29-05-2024	11	36.0	65.5	315.0	NW	14.4	4.0	0.0	0.0
29-05-2024	12	38.5	63.4	315.0	NW	13.0	3.6	0.0	0.0
29-05-2024	13	39.4	62.2	315.0	NW	21.6	6.0	0.0	0.0
29-05-2024	14	41.2	59.8	315.0	NW	16.9	4.7	0.0	0.0
29-05-2024	15	42.4	57.7	315.0	NW	19.8	5.5	0.0	0.0
29-05-2024	16	42.5	56.6	315.0	NW	16.2	4.5	0.0	0.0
29-05-2024	17	41.2	55.5	315.0	NW	13.3	3.7	0.0	0.0
29-05-2024	18	40.7	53.6	135.0	SE	15.8	4.4	0.0	0.0
29-05-2024	19	38.4	54.0	90.0	E	16.2	4.5	0.0	0.0
29-05-2024	20	35.7	55.0	135.0	SE	16.6	4.6	0.0	0.0
29-05-2024	21	33.0	59.0	135.0	SE	13.3	3.7	0.0	0.0
29-05-2024	22	31.2	60.0	135.0	SE	7.9	2.2	0.0	0.0
29-05-2024	23	28.4	64.0	135.0	SE	1.6	0.4	0.0	0.0
29-05-2024	24	26.9	70.0	344.0	NWN	13.0	3.6	0.0	0.0
30-05-2024	1	26.6	71.0	270.0	W	8.6	2.4	0.0	0.0
30-05-2024	2	26.1	71.0	245.0	WSW	13.0	3.6	0.0	0.0
30-05-2024	3	25.9	70.0	315.0	NW	15.1	4.2	0.0	0.0
30-05-2024	4	25.6	71.0	288.0	WNW	1.6	0.4	0.0	0.0
30-05-2024	5	25.5	68.0	295.0	WNW	13.0	3.6	0.0	0.0
30-05-2024	6	26.5	66.0	270.0	W	15.8	4.4	0.0	0.0
30-05-2024	7	27.9	64.0	270.0	W	5.4	1.5	0.0	0.0
30-05-2024	8	29.4	61.0	327.0	NWN	13.3	3.7	0.0	0.0
30-05-2024	9	31.1	60.0	315.0	NW	15.1	4.2	0.0	0.0
30-05-2024	10	33.0	59.0	290.0	WNW	16.6	4.6	0.0	0.0
30-05-2024	11	35.6	55.0	225.0	SW	20.5	5.7	0.0	0.0
30-05-2024	12	38.1	54.0	315.0	NW	19.4	5.4	0.0	0.0
30-05-2024	13	39.4	53.0	315.0	NW	17.6	4.9	0.0	0.0
30-05-2024	14	39.9	51.0	315.0	NW	19.8	5.5	0.0	0.0
30-05-2024	15	40.0	51.0	315.0	NW	21.6	6.0	0.0	0.0
30-05-2024	16	40.4	49.0	90.0	E	19.8	5.5	0.0	0.0
30-05-2024	17	40.4	49.0	315.0	NW	21.6	6.0	0.0	0.0
30-05-2024	18	40.0	51.0	135.0	SE	19.8	5.5	0.0	0.0
30-05-2024	19	38.1	54.0	90.0	E	14.4	4.0	0.0	0.0
30-05-2024	20	35.4	55.0	135.0	SE	15.8	4.4	0.0	0.0
30-05-2024	21	32.0	58.0	135.0	SE	11.9	3.3	0.0	0.0
30-05-2024	22	29.6	61.0	135.0	SE	9.7	2.7	0.0	0.0
30-05-2024	23	28.1	63.0	135.0	SE	8.3	2.3	0.0	0.0
30-05-2024	24	27.2	66.0	135.0	SE	4.7	1.3	0.0	0.0

Hourly Meteorological Data for Pre-monsoon Season 2024 for Proposed Riverbed Mining in Chandhut South Unit, Palwal, Haryana

Date	Time	Temperature (⁰ C)	RH (%)	Direction		Wind Speed		Cloud Cover	Rainfall (mm)
				in angle	in letter	Km/hrs	m/s		
31-05-2024	1	26.9	67.0	289.0	WNW	9.7	2.7	0.0	0.0
31-05-2024	2	26.5	69.0	315.0	NW	14.4	4.0	0.0	0.0
31-05-2024	3	26.1	70.0	315.0	NW	4.7	1.3	0.0	0.0
31-05-2024	4	25.6	68.0	270.0	W	14.4	4.0	0.0	0.0
31-05-2024	5	25.5	65.0	270.0	W	15.8	4.4	0.0	0.0
31-05-2024	6	27.0	59.0	270.0	W	4.0	1.1	0.0	0.0
31-05-2024	7	28.4	57.0	135.0	SE	14.0	3.9	0.0	0.0
31-05-2024	8	29.9	56.0	135.0	SE	8.3	2.3	0.0	0.0
31-05-2024	9	31.5	52.0	270.0	W	14.4	4.0	0.0	0.0
31-05-2024	10	33.4	50.0	270.0	W	13.7	3.8	0.0	0.0
31-05-2024	11	36.0	50.0	270.0	W	16.2	4.5	0.0	0.0
31-05-2024	12	38.1	52.0	315.0	NW	13.3	3.7	0.0	0.0
31-05-2024	13	39.4	51.0	315.0	NW	13.3	3.7	0.0	0.0
31-05-2024	14	41.1	50.0	315.0	NW	16.2	4.5	0.0	0.0
31-05-2024	15	42.1	48.0	315.0	NW	20.2	5.6	0.0	0.0
31-05-2024	16	42.7	48.0	315.0	NW	13.3	3.7	0.0	0.0
31-05-2024	17	42.2	49.0	315.0	NW	15.8	4.4	0.0	0.0
31-05-2024	18	40.6	50.0	303.0	WNW	15.1	4.2	0.0	0.0
31-05-2024	19	38.2	50.0	315.0	NW	12.6	3.5	0.0	0.0
31-05-2024	20	35.7	52.0	315.0	NW	13.7	3.8	0.0	0.0
31-05-2024	21	33.1	56.0	135.0	SE	14.4	4.0	0.0	0.0
31-05-2024	22	31.2	60.0	135.0	SE	9.0	2.5	0.0	0.0
31-05-2024	23	28.8	64.0	135.0	SE	8.3	2.3	0.0	0.0
31-05-2024	24	28.2	70.0	135.0	SE	1.8	0.5	0.0	0.0

ANNEXURES – 3.2

AIR QUALITY DAILY

RESULTS

Annex 3.2: Daily Ambient Air Quality Data

Jhuppa						AAQ-1
S. No.	Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)
1	03-03-2024	71.6	31.1	9.2	12.9	0.99
2	04-03-2024	76.9	26.9	9.0	12.6	0.92
3	10-03-2024	82.9	29.9	8.5	11.9	0.96
4	11-03-2024	69.6	31.3	9.7	13.6	1.02
5	17-03-2024	65.4	22.9	8.5	11.9	1.05
6	18-03-2024	79.5	31.0	9.4	13.2	1.06
7	24-03-2024	75.9	26.6	11.5	16.1	1.15
8	25-03-2024	61.4	21.5	10.5	14.7	1.14
9	03-04-2024	83.4	29.2	9.8	13.7	1.19
10	03-04-2024	62.5	31.4	11.8	16.5	1.22
11	10-04-2024	75.6	26.5	11.4	16.0	1.28
12	11-04-2024	82.7	28.9	11.0	15.4	1.33
13	17-04-2024	78.2	27.4	11.5	16.1	1.15
14	18-04-2024	63.4	22.2	10.5	14.7	1.08
15	24-04-2024	82.6	30.1	9.2	12.9	1.01
16	25-04-2024	58.7	20.5	9.5	13.3	0.96
17	03-05-2024	86.1	30.1	11.4	16.0	0.89
18	04-05-2024	78.5	27.5	9.8	13.7	0.98
19	10-05-2024	63.9	22.4	10.1	14.1	0.92
20	11-05-2024	88.5	31.0	8.0	11.2	0.95
21	17-05-2024	84.8	29.7	7.9	11.1	1.02
22	18-05-2024	72.3	25.3	8.4	11.8	1.11
23	24-05-2024	74.6	26.1	7.9	11.1	0.99
24	25-05-2024	89.6	31.4	7.2	10.1	1.10
Maximum		89.6	31.4	11.8	16.5	1.33
Minimum		58.7	20.5	7.2	10.1	0.89
Mean		75.4	27.5	9.7	13.5	1.06
Percentile 98		89.1	31.4	11.7	16.3	1.31
Standard Deviation		9.1	3.5	1.3	1.9	0.12

Chandhat						AAQ-2
S. No.	Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)
1	03-03-2024	68.4	23.9	9.8	13.7	0.93
2	04-03-2024	70.2	24.6	9.6	13.4	0.98
3	10-03-2024	72.5	25.4	9.5	13.3	0.99
4	11-03-2024	71.5	25.0	7.1	11.6	1.06
5	17-03-2024	74.6	26.1	9.4	13.2	1.09
6	18-03-2024	77.5	27.1	10.5	14.7	1.12
7	24-03-2024	80.1	28.0	11.1	15.5	1.16
8	25-03-2024	81.6	28.6	9.6	13.4	1.12
9	03-04-2024	78.4	27.4	10.5	14.7	1.19
10	03-04-2024	77.0	27.0	8.5	11.9	1.06
11	10-04-2024	79.2	27.7	7.9	11.1	0.95
12	11-04-2024	76.5	26.8	9.8	13.7	1.08
13	17-04-2024	74.6	26.1	10.0	14.0	1.06

Annex 3.2: Daily Ambient Air Quality Data

Chandhat						AAQ-2
S. No.	Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)
14	18-04-2024	72.1	25.2	9.8	13.7	1.12
15	24-04-2024	78.5	27.5	11.0	15.4	1.16
16	25-04-2024	82.1	28.7	9.0	12.6	1.08
17	03-05-2024	79.4	27.8	10.5	14.7	1.01
18	04-05-2024	77.2	27.0	10.1	14.1	1.09
19	10-05-2024	74.6	26.1	10.0	14.0	1.00
20	11-05-2024	71.8	25.1	9.8	13.7	0.95
21	17-05-2024	74.8	26.2	7.2	10.1	0.92
22	18-05-2024	68.6	24.0	9.1	12.7	0.99
23	24-05-2024	72.5	25.4	10.1	14.1	0.89
24	25-05-2024	74.8	26.2	10.9	15.3	1.01
Maximum		82.1	28.7	11.1	15.5	1.19
Minimum		68.4	23.9	7.1	10.1	0.89
Mean		75.4	26.4	9.6	13.5	1.04
Percentile 98		81.9	28.7	11.1	15.5	1.18
Standard Deviation		3.9	1.4	1.1	1.4	0.08

Sultanpur						AAQ-3
S. No.	Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)
1	04-03-2024	72.8	31.5	13.5	17.6	1.18
2	05-03-2024	89.5	32.8	12.5	16.3	1.16
3	11-03-2024	62.4	34.1	13.1	17.0	1.26
4	12-03-2024	85.6	29.9	12.0	15.6	1.29
5	18-03-2024	58.4	30.8	11.4	14.8	1.30
6	19-03-2024	86.5	31.8	10.5	13.7	1.36
7	25-03-2024	74.6	34.1	12.8	16.6	1.25
8	26-03-2024	89.0	35.8	13.4	17.4	1.36
9	04-04-2024	69.8	31.4	10.5	13.7	1.43
10	05-04-2024	71.2	34.3	10.9	14.2	1.50
11	11-04-2024	86.4	35.4	11.9	15.5	1.21
12	12-04-2024	89.1	29.6	12.1	15.7	1.18
13	18-04-2024	76.8	37.0	13.8	17.9	1.16
14	19-04-2024	58.6	38.5	12.1	15.7	1.24
15	25-04-2024	88.9	33.4	13.0	16.9	1.26
16	26-04-2024	68.4	30.9	14.8	19.2	1.36
17	04-05-2024	84.5	28.5	13.7	17.8	1.31
18	05-05-2024	71.5	31.8	14.6	19.0	1.21
19	11-05-2024	80.1	34.2	12.4	16.1	1.19
20	12-05-2024	78.9	29.1	12.9	16.8	1.09
21	18-05-2024	71.9	28.6	10.6	13.8	1.05
22	19-05-2024	79.4	31.8	13.8	17.9	1.16
23	25-05-2024	82.4	29.3	14.9	19.4	1.22
24	26-05-2024	75.6	28.7	12.0	15.6	1.35
Maximum		89.5	38.5	14.9	19.4	1.50
Minimum		58.4	28.5	10.5	13.7	1.05

Annex 3.2: Daily Ambient Air Quality Data

Sultanpur						AAQ-3
S. No.	Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)
Mean		77.2	32.2	12.6	16.4	1.25
Percentile 98		89.3	37.8	14.9	19.3	1.47
Standard Deviation		9.5	2.8	1.3	1.7	0.11

Gharbara						AAQ-4
S. No.	Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)
1	04-03-2024	73.6	25.8	11.5	15.0	0.94
2	05-03-2024	76.3	26.7	12.5	16.3	0.99
3	11-03-2024	78.2	27.4	12.9	16.8	0.92
4	12-03-2024	79.2	27.7	13.5	17.6	0.99
5	18-03-2024	80.4	28.1	13.0	16.9	1.01
6	19-03-2024	73.8	25.8	13.4	17.4	1.09
7	25-03-2024	70.0	24.5	14.1	18.3	1.04
8	26-03-2024	78.0	27.3	13.8	17.9	1.10
9	04-04-2024	80.8	28.3	14.5	18.9	1.12
10	05-04-2024	81.5	28.5	14.1	18.3	1.11
11	11-04-2024	82.9	29.0	13.7	17.8	1.10
12	12-04-2024	81.4	28.5	12.5	16.3	1.16
13	18-04-2024	77.5	27.1	12.0	15.6	1.19
14	19-04-2024	78.9	27.6	12.5	16.3	1.05
15	25-04-2024	75.9	26.6	12.8	16.6	1.01
16	26-04-2024	77.5	27.1	11.9	15.5	0.95
17	04-05-2024	64.1	22.4	11.5	15.0	1.01
18	05-05-2024	62.5	21.9	12.4	16.1	1.12
19	11-05-2024	67.4	23.6	13.8	17.9	1.18
20	12-05-2024	68.3	23.9	14.0	18.2	1.11
21	18-05-2024	70.7	24.7	13.1	17.0	1.05
22	19-05-2024	73.0	25.6	12.4	16.1	1.00
23	25-05-2024	77.8	27.2	11.2	14.6	0.95
24	26-05-2024	72.9	25.5	11.9	15.5	0.92
Maximum		82.9	29.0	14.5	18.9	1.19
Minimum		62.5	21.9	11.2	14.6	0.92
Mean		75.1	26.3	12.9	16.7	1.05
Percentile 98		82.3	28.8	14.3	18.6	1.19
Standard Deviation		5.6	2.0	0.9	1.2	0.08

Mirpur Kachh						AAQ-5
S. No.	Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)
1	05-03-2024	67.5	23.6	9.8	12.7	0.75
2	06-03-2024	71.9	25.2	10.5	13.7	0.72
3	12-03-2024	74.5	26.1	7.6	11.9	0.78
4	13-03-2024	73.9	25.9	10.5	13.7	0.86
5	19-03-2024	76.8	26.9	8.4	10.9	0.96
6	20-03-2024	75.1	26.3	9.5	12.4	0.98

Annex 3.2: Daily Ambient Air Quality Data

Mirpur Kachh						AAQ-5
S. No.	Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)
7	26-03-2024	69.5	24.3	10.0	13.0	1.06
8	27-03-2024	68.2	23.9	9.1	11.8	1.08
9	05-04-2024	59.5	20.8	8.5	11.1	1.13
10	06-04-2024	67.0	23.5	7.6	10.8	0.95
11	12-04-2024	72.4	25.3	7.4	11.7	0.91
12	13-04-2024	69.2	24.2	8.8	11.4	0.89
13	19-04-2024	72.2	25.3	9.6	12.5	0.81
14	20-04-2024	74.2	26.0	10.4	13.5	0.88
15	26-04-2024	72.4	25.3	11.0	14.3	0.81
16	27-04-2024	69.2	24.2	11.6	15.1	0.75
17	05-05-2024	67.8	23.7	10.4	13.5	0.73
18	06-05-2024	72.8	25.5	8.6	11.2	0.78
19	12-05-2024	65.2	22.8	9.4	12.2	0.76
20	13-05-2024	70.9	24.8	11.5	15.0	0.91
21	19-05-2024	68.4	23.9	11.1	14.4	0.96
22	20-05-2024	75.9	26.6	10.6	13.8	0.86
23	26-05-2024	72.9	25.5	9.7	12.6	0.88
24	27-05-2024	67.5	23.6	10.9	14.2	0.80
Maximum		76.8	26.9	11.6	15.1	1.13
Minimum		59.5	20.8	7.4	10.8	0.72
Mean		70.6	24.7	9.7	12.8	0.88
Percentile 98		76.4	26.7	11.6	15.0	1.11
Standard Deviation		3.9	1.4	1.2	1.3	0.11

Gori						AAQ-6
S. No.	Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)
1	05-03-2024	68.3	23.9	7.5	11.3	0.79
2	06-03-2024	67.9	23.8	7.9	11.9	0.85
3	12-03-2024	65.8	23.0	8.5	12.8	0.88
4	13-03-2024	70.3	24.6	8.0	12.0	0.90
5	19-03-2024	72.7	25.4	8.4	12.6	0.99
6	20-03-2024	72.8	25.5	9.1	13.7	0.95
7	26-03-2024	70.2	24.6	8.8	13.2	1.02
8	27-03-2024	69.5	24.3	9.5	14.3	0.96
9	05-04-2024	71.8	25.1	9.1	13.7	0.84
10	06-04-2024	68.5	24.0	7.5	11.3	0.88
11	12-04-2024	66.5	23.3	8.4	12.6	0.78
12	13-04-2024	60.2	21.1	7.5	11.3	0.85
13	19-04-2024	65.4	22.9	8.5	12.8	0.96
14	20-04-2024	62.5	21.9	6.9	10.4	0.88
15	26-04-2024	63.9	22.4	7.5	11.3	0.99
16	27-04-2024	67.5	23.6	6.5	10.7	0.92
17	05-05-2024	70.1	24.5	7.5	11.3	0.81
18	06-05-2024	71.2	24.9	8.5	12.8	0.75

Annex 3.2: Daily Ambient Air Quality Data

Gori						AAQ-6
S. No.	Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)
19	12-05-2024	70.6	24.7	7.8	11.7	0.94
20	13-05-2024	72.6	25.4	8.5	12.8	0.84
21	19-05-2024	68.5	24.0	6.5	10.8	0.81
22	20-05-2024	64.8	22.7	7.9	11.1	0.75
23	26-05-2024	68.1	23.8	6.8	10.2	0.79
24	27-05-2024	62.9	22.0	9.2	13.8	0.80
Maximum		72.8	25.5	9.5	14.3	1.02
Minimum		60.2	21.1	6.5	10.2	0.75
Mean		68.0	23.8	8.0	12.1	0.87
Percentile 98		72.8	25.5	9.4	14.0	1.01
Standard Deviation		3.4	1.2	0.8	1.2	0.08

ANNEXURES – 3.3

MONITORING

PHOTOGRAPHS

Annex 3.3: Monitoring Photographs

Air Monitoring



Noise Monitoring

Annex 3.3: Monitoring Photographs



Soil Sampling

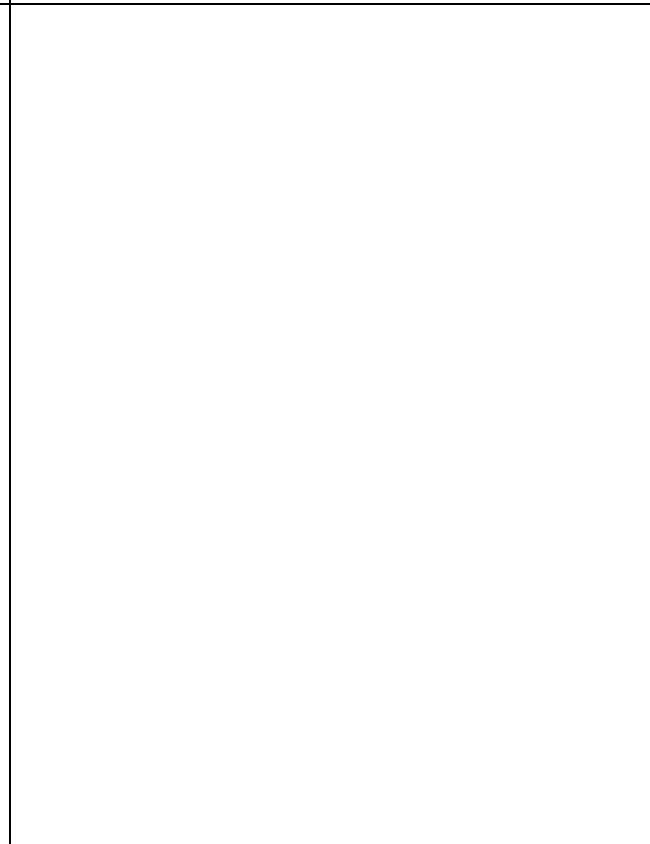
Annex 3.3: Monitoring Photographs



Water Sampling



Annex 3.3: Monitoring Photographs



ANNEXURES – 10.1

**CA CERTIFICATE FOR
PROJECT COST**



**DEEPAK H KUMAR
& ASSOCIATES**

CHARTERED ACCOUNTANTS

Certificate for Project Cost

Based on the book so account, documents and other information provided to us of M/s Apex Project Works, having its office at **Shop No.-1, Manjeet Filling Station, Near Yamuna Pul, Village Manglora, District Karnal,132001 (Haryana)**, we hereby confirm that department of mines & Geology, Haryana has awarded Contract in respect of "Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/year production over an area of 98.156 ha located at Village Chandhut South, Tehsil & District Palwal and State Haryana" to the firm.

Further, we hereby confirm that the total estimated project cost for 1st year of river sand mine project is INR 17.00 Crores (INR Seventeen Crore Only) considering plant & machinery and other requirement 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	0.00
2	Annual Contract Money (Lease)	1179.26
3	Security	294.82
4	Mines and Minerals Development, Restoration and Rehabilitation Fund & District Mineral Fund	117.93
5	Projected Working Capital	89.47
6	Miscellaneous	18.52
Total Project Cost		1700.00

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.

**For Deepak H Kumar & Associates
Chartered Accountants**

Date :- 22/05/2024

Place :- Yamunanagar



**CA Deepak
Membership No 567677
(Proprietor)**

OFFICE : OPP KUMAR MALL SARNI CHOWNK YAMUNANAGAR-135001, HARYANA (INDIA)

TEL:- +91-9416335333, +91-7206255508

EMAIL : ca.dkumar28@gmail.com

ANNEXURES – 12.1
QCI NABET
CERTIFICATE
(ENVIRONMENT
CONSULTANT)



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
8	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IAAC minutes dated January 4, 2022, Supplementary assessment minutes dated April 22, 2022 and November 1, 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/22/2404 dated June 23, 2022. The accreditation needs to be renewed before the expiry date by Parivesh Environmental Engineering Services, Lucknow following due process of assessment.

NABET

Sr. Director, NABET
Dated: April 3, 2023

Certificate No.
NABET/EIA/2124/IA 0092(Rev.02)

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

NABL CERTIFICATE

(LABORATORY)



National Accreditation Board for
Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

ASIA ENVIRO LAB

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

**"General Requirements for the Competence of Testing &
Calibration Laboratories"**

for its facilities at

H1-837, PHASE-2, RIICO INDUSTRIAL AREA, BHIWADI, ALWAR, RAJASTHAN, INDIA

in the field of

TESTING

Certificate Number: TC-6004

Issue Date: 16/03/2023

Valid Until:

15/03/2025

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : ASIA ENVIRO LAB

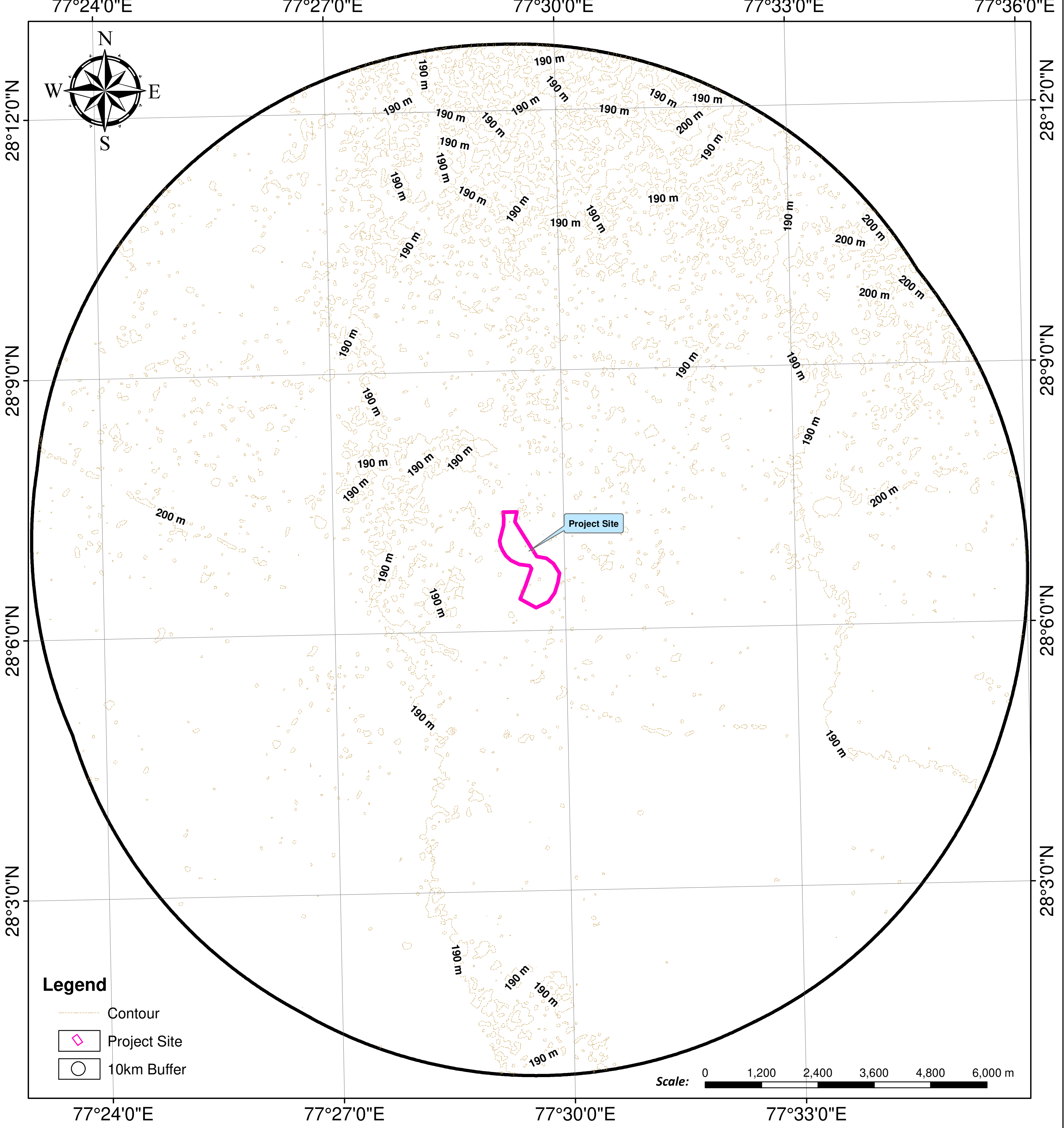
Signed for and on behalf of NABL



N. Venkateswaran
Chief Executive Officer

ADDITIONAL ANNEXURES

ADDITIONAL ANNEXURES – 1
CONTOUR MAP OF
STUDY AREA



Minor Mineral Sand of Chandhut (South)

M/s. Apex Project works

**At Village: Chandhut, Tehsil: Palwal,
District: Palwal, Haryana**

Note:

No National Park, Wild Life Sanctuary,
Biosphere Reserves,
Wild Life Corridors exists within
10 km from Project Site

Figure No. :
Contour Map
(within 10km radius)

© 2023

Source:

1. Survey of India Toposheets No. H43X8 (Project Site)
2. Survey of India Toposheets_G43F5,G43F9,H43X7,H43X8,H43X11&H43X12
3. Layout Plan provided by PP
4. Google Satellite Imagery, 2023
5. Data Provided by FAE (LU)

Software Used:

1. ArcGIS 10.1

ADDITIONAL ANNEXURES – 2
UNDERTAKING

GSTIN :
PAN :



MOB. +91 98128 44250
E-mail : vipin.shrm001@gmail.com

APEX PROJECT WORKS

H OFFICE :
Shop No.-1, Manjeet Filling Station,,
Near – Yamuna Pul, Vill – Manglora
Distt – Karnal -1322001 (HR)



SITE ADDRESS :
Att – Chandhut South Block,
Distt – Palwal, Haryana

UNDERTAKING

I, Mr. Vipin, Authorized Signatory of M/s Apex Project Works, having its registered office at Shop No.-1, Manjeet Filling Station, Near Yamuna Pul, Village Manglora, District Karnal,132001 (Haryana), for the for the Proposed Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha located at Village Chandhut South, 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.

Behalf of M/s Apex Project Works

Vipin
Date & Place

Date

Place

Thanking You,

For M/s  Apex Project Works

Authorized Signatory

EXECUTIVE SUMMARY

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut South Unit)

Production Capacity - 43,35,000 MT/ year
Area - 98.156 ha

Village Chandhut South, Tehsil & District Palwal and State Haryana.



PROPONENT	:	M/S APEX PROJECT WORKS
ENVIRONMENT CONSULTANT	:	PARIVESH ENVIRONMENTAL ENGINEERING SERVICES Nabet Certificate No. - NABET /EIA/2124/IA 0092 (Rev.01)
STUDY PERIOD	:	PRE-MONSOON (MARCH TO MAY 2024)
VERSION	:	PEES/EIA/23-24/36

495
JULY 2024

EXECUTIVE SUMMARY

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

Executive Summary**Project Introduction**

This is the sand mine project on riverbed of Yamuna River. Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River with 43,35,000 MT/ year production over an area of 98.156 ha located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

- A Letter of Intent (LOI) has been issued by the Director Mines & geology Haryana vide letter No. DMG/HY/Chandhut (South) Unit/Palwal/2023/5727 dated 05.10.2023 for mining of Sand (Minor Mineral) in Chandhut (South) Unit, comprising Chandhut (South) village over an area of 98.156 ha (245.39 acres) in district Palwal, Haryana for a period of 10 years.
- 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 Memo No. MO/FBD/3589 dated 20.11.2023 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.
- The mining plan was submitted to department and mining plan was approved vide reference no. DMG/HY/MP/CHANDHUT SOUTH/PLWL/2024/2155 DATED 02.05.2024.
- Forest NOC has been issued by the Office of Divisional Forest Officer, Palwal Forest Division, Palwal vide reference no. 3693 dated 12.12.2023 which confirms project site is not part of any reserve forest or protected forest.
- The water requirement will be fulfilled by private water tankers. Electrical supply is available in all nearby villages. The permission will be taken from concerned department for the electricity use.

Project Description**Table 1: Salient Features of Mine**

S. No.	Parameters	Description
1.	Name of the project	Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) by M/s Apex Project Works.
2.	Nature & category of Mine	Non-Coal Mining Category 'B' of Activity 1(B)
3.	Project Proponent	M/s Apex Project Works
4.	Khasra No.	For Mining 77// 14, 15 min, 16 min, 17, 24 min, 25 min, 107// , 4 min, 7 min, 14 min, 15 min, 16 min, 17, 24, 25 min, 115// , 1 min, 10 min, 11 min, 12 min, 19 min, 20, 21, 22 min, 116// , 3, 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 23, 24, 25, 146//, 3, 4, 5, 6, 7, 8, 9, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20 min, 21 min, 22, 23, 24, 25,

PROPOSER: M/S APEX PROJECT WORKS, HARYANA 496

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 1

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5.	Total Lease area	98.156 Ha (245.39 Acre) - Riverbed of Yamuna River																																										
6.	Location of the project	Village- Chandhut South, Tehsil & District- Palwal, Haryana																																										
7.	Toposheet No.	H43X8 - Project Site & G43F5, G43F9, H43X7, H43X8, H43X11 & H43X12 - Study Area.																																										
8.	Maximum Production Capacity	43,35,000 Metric Tonne / Year																																										
9.	Geological Mineral Reserve	49,25,880 Metric Tonne																																										
10.	Blocked Mineral Reserve	5,90,112 Metric Tonne																																										
11.	Mineable Reserve	43,35,768 Metric Tonne																																										
12.	Geographical co-ordinates	<table border="1"> <thead> <tr> <th>Point</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">Chandhut (South)</td> </tr> <tr> <td>A1</td> <td>28° 7' 22.4796"N</td> <td>77° 29' 23.399" E</td> </tr> <tr> <td>B1</td> <td>28°7' 15.652" N</td> <td>77°29' 21.692" E</td> </tr> <tr> <td>C1</td> <td>28°6' 51.324" N</td> <td>77°29' 38.139" E</td> </tr> <tr> <td>D1</td> <td>28°6' 49.868" N</td> <td>77°29' 45.677" E</td> </tr> <tr> <td>E1</td> <td>28°6' 46.099" N</td> <td>77°29' 50.988" E</td> </tr> <tr> <td>F1</td> <td>28°6' 39.589" N</td> <td>77°29' 55.700" E</td> </tr> <tr> <td>G1</td> <td>28°6' 33.250" N</td> <td>77°29' 54.415" E</td> </tr> <tr> <td>H1</td> <td>28°6' 25.798" N</td> <td>77°29' 51.588" E</td> </tr> <tr> <td>I1</td> <td>28°6' 19.887" N</td> <td>77°29' 46.534" E</td> </tr> <tr> <td>J1</td> <td>28°6' 15.97" N</td> <td>77°29' 36.67" E</td> </tr> <tr> <td>L1</td> <td>28°6' 22.16" N</td> <td>77°29' 24.65" E</td> </tr> <tr> <td>M1</td> <td>28°6' 31.708" N</td> <td>77°29' 29.316" E</td> </tr> </tbody> </table>	Point	Latitude	Longitude	Chandhut (South)			A1	28° 7' 22.4796"N	77° 29' 23.399" E	B1	28°7' 15.652" N	77°29' 21.692" E	C1	28°6' 51.324" N	77°29' 38.139" E	D1	28°6' 49.868" N	77°29' 45.677" E	E1	28°6' 46.099" N	77°29' 50.988" E	F1	28°6' 39.589" N	77°29' 55.700" E	G1	28°6' 33.250" N	77°29' 54.415" E	H1	28°6' 25.798" N	77°29' 51.588" E	I1	28°6' 19.887" N	77°29' 46.534" E	J1	28°6' 15.97" N	77°29' 36.67" E	L1	28°6' 22.16" N	77°29' 24.65" E	M1	28°6' 31.708" N	77°29' 29.316" E
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PROPOSER: M/S APEX PROJECT WORKS, HARYANA 497

CONSULTANT: PARIVESH ENVIRONMENTAL ENGINEERING SERVICES (NABET /EIA/2124/IA 0092(Rev.01))

PAGE 2

EXECUTIVE SUMMARY

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

S. No.	Parameters	Description																		
		N1 28°6' 43.035" N 77°29' 33.998" E																		
		N2 28°6' 45.131" N 77°29' 32.411" E																		
		N3 28°6' 46.154" N 77°29' 24.476" E																		
		O1 28°6' 48.827" N 77°29' 18.139" E																		
		O2 28°6' 52.236" N 77°29' 14.026" E																		
		P1 28°6' 55.886" N 77°29' 11.661" E																		
		P2 28°6' 59.260" N 77°29' 10.000" E																		
		Q1 28°7' 2.766" N 77°29' 9.457" E																		
		R1 28°7' 13.205" N 77°29' 12.799" E																		
		R2 28°7' 18.063" N 77°29' 12.912" E																		
		S1 28°7' 22.419" N 77°29' 12.698" E																		
13.	Topography of ML area	Highest elevation in riverbed at extreme north end is 127.25 mRL and bank top level is 130.0 mRL whereas the levels at the extreme south end in riverbed is 124.78 mRL and Riverbank top is 128.17 mRL. The Yamuna River flows from N to S direction in Chandhut revenue village.																		
14.	Mining Method & Technology	Mining activity will be carried out by opencast mechanized 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. Adequate quantity of sand reserves is available for meeting consumer demand.																		
15.	Ultimate depth of Mining	3 m from the riverbed of Yamuna River																		
16.	Ground water level	05 - 10 m from the surface level																		
17.	GWT intersection	Mining will be done only up to 3 m from surface. So, ground water table will not be intersected.																		
18.	Working Days	268 Days																		
19.	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.																		
20.	Water requirement & source	The source of water is private water tankers. The break-up of water requirement is as follows: <table border="1"> <thead> <tr> <th>S. No.</th> <th>Description</th> <th>Demand</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Dust Suppression</td> <td>16.10 KLD</td> </tr> <tr> <td>2</td> <td>Greenbelt Development</td> <td>13.70 KLD</td> </tr> <tr> <td>3</td> <td>Domestic Requirement</td> <td>7.90 KLD</td> </tr> <tr> <td colspan="2">Total Says</td> <td>37.70 KLD</td> </tr> <tr> <td colspan="2"></td> <td>38.00 KLD</td> </tr> </tbody> </table>	S. No.	Description	Demand	1	Dust Suppression	16.10 KLD	2	Greenbelt Development	13.70 KLD	3	Domestic Requirement	7.90 KLD	Total Says		37.70 KLD			38.00 KLD
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21.	Cost of project	The capital cost for the project will be Rs. 17 Crores including proposed lease area and machinery will be hired on contract bases.																		

Source: Approved Mining Plan

EXECUTIVE SUMMARY

Mining of Sand (Minor Mineral) from the Riverbed of Yamuna River (Chandhut (South) Unit) with 43,35,000 MT/ year production over an area of 98.156 ha (245.39 acres) located at Village Chandhut South, Tehsil & District Palwal and State Haryana.

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.

Description of Baseline Environment

Environmental data has been collected during pre-monsoon season i.e., March to May 2024 in accordance with the guidelines for preparation of EIA studies.

Table 2: Baseline Status

Parameters	Baseline Status
Ambient Air Quality	Particulate Matter: PM ₁₀ varying from 73 µg/m ³ to 89 µg/m ³ . PM _{2.5} was observed 25 µg/m ³ to 38 µg/m ³ . Gaseous Pollutants: SO ₂ was varying from 9.4 µg/m ³ to 14.9 µg/m ³ . NO _x was observed from 14.0 µg/m ³ to 19.3 µg/m ³ in study area. CO was observed from 1.01 mg/m ³ to 1.47 mg/m ³ in study area.
Noise Level	The Sound Pressure Level recorded during the daytime on all locations varies from 50.8 dB(A) to 51.8 dB(A) & in time it varies between 33.1 dB(A) to 36.4 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 (7.10 to 7.85), TDS (789 mg/l to 851 mg/l), alkalinity (219.5 mg/l to 274.3 mg/l), Total Hardness (287.5 mg/l to 309.6 mg/l), Calcium as Ca (61.9 mg/l to 74.8 mg/l), Magnesium as Mg (31.8 mg/l to 36.4 mg/l), Chloride (241.9 mg/l to 262.9 mg/l) & Sulphate (39.8 mg/l to 59.6 mg/l) parameters were analyzed.
Surface Water	The pH was between 7.36 to 8.14. The dissolved Oxygen of the sources was varying between 6.0 mg/l to 6.5 mg/l. BOD was observed 32.6 mg/l to 42.7 mg/l. Water was not usable due to bad quality.
Soil Quality	The soil was predominantly Loamy in the study area. The pH ranges 7.2 to 7.9. The conductivity was varying from 337 µmhos/cm to 416 µmhos/cm. Organic Carbon was varying from 0.59 % to 0.78 %. Nitrogen was varying from 134 kg/ha to 171 kg/ha. Phosphorous was varying from 12 kg/ha to 24 kg/ha. Potassium was varying from 128 kg/ha to 164 kg/ha. 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.
Meteorology	The maximum temperature recorded during the study period was 45.3°C in the month of May and the minimum temperature was 14.4°C in the month of March. The highest RH found in the study area was 79.7% in the month of April, while minimum monthly average RH found 45.5% in the month of March. The average wind speed recorded was 2.8 m/sec. Predominant wind direction during the study period was mainly South-West to North-East followed by North- East to South-West.

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 1,941 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.

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Accidents may occur due to fast movement of vehicles. The truck movement will be from suggested transportation route only. It is proposed to plant 13,710 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 ground water table 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 1.6 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 42 Kg per day, which will have an adverse impact on human health. There will be 10 Nos. of garbage bins, 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.
- ✓ According to field survey, interviews of residents and authenticated checklist from forest department indicates the presence of 06 Schedule-I species in the buffer area of study area of proposed mine lease area. Hence, for the protection of these schedule-I species, a detailed conservation plan is proposed with futuristic approach. The species are Varanus benghalensis (Common Indian Monitor lizard), Naja naja (Indian Cobra), Ptyas mucosa (Rat Snake), Pavo cristatus (Indian Peafowl), Herpestes edwardsii (Common Mongoose) & Felis chaus (Jungle Cat), for the same conservation plan was prepared. Subsequently, a budget of Rs. 34 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.

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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.

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.

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 175 persons will get direct employment and 30 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.

EXECUTIVE SUMMARY

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- ✓ Development of facilities within villages like roads, etc.

Cost of Environment Management Plan

For the environment Management, detailed activities has been calculated which are INR 18.50 Lakhs as a Capital Cost and INR 5.80 Lakhs per annum as a Recurring cost, respectively. Total budget of INR 47.50 Lakhs for environmental measurements has been ensured by the developer for plan period.

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 13,710 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.

कार्यकारी सारांश

यमुना नदी के तल से रेत (लघु खनिज) की खनन परियोजना

(छाँदहूत साउथ इकाई)

उत्पादन क्षमता - 43,35,000 मीट्रिक टन/वर्ष

क्षेत्रफल - 98.156 हेक्टेयर

गांव छाँदहूत साउथ, तहसील और जिला पलवल और राज्य हरियाणा।



PROPONENT	:	M/S APEX PROJECT WORKS
ENVIRONMENT CONSULTANT	:	PARIVESH ENVIRONMENTAL ENGINEERING SERVICES Nabet Certificate No. - NABET /EIA/2124/IA 0092 (Rev.01)
STUDY PERIOD	:	PRE-MONSOON (MARCH TO MAY 2024)

JULY 2024

503

यमुना नदी (Chandhut साउथ यूनिट) के नदी तल से रेत (लघु खनिज) का खनन, क्षेत्रफल - 98.156 हेक्टेयर, उत्पादन क्षमता - 43,35,000 मीट्रिक टन प्रति वर्ष, स्थान - गांव Chandhut साउथ, तहसील और जिला पलवल और राज्य हरियाणा।

कार्यकारी सारांश।

परियोजना का परिचय

यह यमुना नदी के बेड पर रेत खदान परियोजना है। यमुना नदी के किनारे से रेत (लघु खनिज) की खदानी क्रिया को 43,35,000 मीट्रिक टन प्रति वर्ष उत्पाद के साथ 98.156 हेक्टेयर क्षेत्र पर स्थित गाँव छाँदहूत साउथ, तहसील और जिला पलवल, और हरियाणा राज्य में किया जा रहा है।

- एक पत्रक (Letter of Intent - LOI) को 21-07-2023 को डायरेक्टर खदान और भूगर्भ हरियाणा के द्वारा जारी किया गया है, जिसमें DMG/HY/Chandhut (South) Unit/Palwal/2023/5727 डेटेड 05.10.2023, एम/एस ऐपेक्स प्रोजेक्ट वर्क्स को छाँदहूत साउथ यूनिट में रेत (लघु खनिज) की खदानी के लिए, छाँदहूत साउथ गाँव, पलवल जिले में 245.39 एकड़ (98.156 हेक्टेयर) क्षेत्र को 10 वर्षों के लिए दिया गया है।
- खनिज और भूगर्भ विभाग, फरीदाबाद से प्राप्त क्लस्टर एनओसी (NOC) द्वारा 20.11.2023 को डेटेड MO/FBD/3589 अनुसार पुष्टि हो गई है, जिससे प्रक्रिया क्षेत्र की परिसीमा से 500 मीटर की दूरी पर कोई अन्य खदानी गतिविधि नहीं है और इसे खदानी क्लस्टर बनाने के लिए। इसलिए, यह क्षेत्र में व्यक्तिगत परियोजना है।
- खनिज योजना विभाग को प्रस्तुत की गई थी और इसको संदर्भ संख्या DMG/HY/MP/CHANDHUT SOUTH/PLWL/2024/2155 डेटेड 02.05.2024 को स्वीकृति प्राप्त हुई थी।
- वन एनओसी को पलवल वन डिवीजन के क्षेत्रीय वन अधिकारी के कार्यालय ने 12.12.2023 को डेटेड 3693 संदर्भ से जारी किया गया है, जिससे पुष्टि होती है कि परियोजना स्थल कोई संरक्षित वन या संरक्षित वन का हिस्सा नहीं है।
- निजी जल टैंकर्स द्वारा जल आवश्यकता पूरी की जाएगी। सभी पास के गाँवों में इलेक्ट्रिकल सप्लाई उपलब्ध है। विद्युत उपयोग के लिए संबंधित विभाग से इसकी अनुमति ली जाएगी।

परियोजना का विवरण

सारणी 1: मेरी मुख्य विशेषताएं

एस. नं.	पैरामीटर	विवरण
एक.	परियोजना का नाम	मैसर्स ऐपेक्स प्रोजेक्ट वर्क्स द्वारा यमुना नदी (छाँदहूत साउथ यूनिट) के नदी तल से रेत (लघु खनिज) का खनन।
दो.	मेरी प्रकृति और श्रेणी	गतिविधि की गैर-कोयला खनन श्रेणी 'बी' 1 (बी)
तीन.	परियोजना प्रस्तावक	मैसर्स ऐपेक्स प्रोजेक्ट वर्क्स
चार.	खसरा नं.	For Mining

प्रस्तावक: मैसर्स ऐपेक्स प्रोजेक्ट वर्क्स

सलाहकार: परिवेश पर्यावरण इंजीनियरिंग सेवाएं (एनएबीईटी / ईआई 504124 / आईए 0092 (रेव.01))

पृष्ठ 1

कार्यकारी सारांश।

यमुना नदी (Chandhuth साउथ यूनिट) के नदी तल से रेत (लघु खनिज) का खनन, क्षेत्रफल - 98.156 हेक्टेयर, उत्पादन क्षमता - 43,35,000 मीट्रिक टन प्रति वर्ष, स्थान - गाँव Chandhuth साउथ, तहसील और जिला पलवल और राज्य हरियाणा।

एस. नं.	पैरामीटर	विवरण
		77// 14, 15 min, 16 min, 17, 24 min, 25 min, 107// , 4 min, 7 min, 14 min, 15 min, 16 min, 17, 24, 25 min, 115// , 1 min, 10 min, 11 min, 12 min, 19 min, 20, 21, 22 min, 116// , 3, 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 23, 24, 25, 146// , 3, 4, 5, 6, 7, 8, 9, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20 min, 21 min, 22, 23, 24, 25, 147// , 1, 2 min, 3 min, 8 min, 9, 10, 11, 12, 13 min, 17 min, 18, 19, 20, 21, 22, 23, 24 min 151// , 10 min, 11 min, 12 min, 13 min, 18 min, 19, 20, 21, 22, 23, 24 min 152// , 17, 18, 19, 20, 21 min, 22 min, 23, 24, 25 153// , 1 min, 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12 min, 13 min, 14, 15, 16, 17 min, 18 min, 24 min, 25 min, 182// , 2 min, 3 min, 4, 5, 6, 7, 8 min, 13 min, 14, 15, 16, 17, 18 min, 23 min, 24, 25, 183// , 1, 2, 3, 4 min, 5 min, 6 min, 7, 8, 9, 10, 11, 12, 13, 14, 15 min, 16 min, 17, 18, 19, 20, 21, 22, 23, 24, 25, 186// , 1, 2, 3, 4, 5 min, 6 min, 7, 8, 9, 10, 11, 12, 13, 14, 15 min, 16 min, 17, 18, 19, 20, 21, 22, 23, 24, 25 min, 187// , 2 min, 3, 4, 5, 6, 7, 8, 9 min, 12 min, 13, 14, 15, 16, 17, 18, 19 min, 21 min, 22 min, 23, 24, 25, 215// , 16 min 216// , 1 min, 2, 3, 4, 5, 6, 7, 8, 9, 10 min, 11 min, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 min, 22 min, 23, 24, 25, 217// , 1, 2, 3, 4, 5 min, 6 min, 7 min, 8, 9, 10, 11, 12, 13, 14 min, 17 min, 18, 19, 20, 21, 22, 23 min, 220// , 1, 2 min, 3 min, 9 min, 10 min, 221// , 3 min, 4 min, 5, 6 min. 293 min. For Ancillary area 105// 21, 22, 23, 24, 25 118// 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15.
पाँच.	कुल पट्टा क्षेत्र	98.156 हेक्टेयर (245.39 एकड़) - यमुना नदी का नदी तल
छः.	परियोजना का स्थान	गाँव - छँदहूत साउथ, तहसील और जिला - पलवल, हरियाणा
सात.	टॉपशीट नं.	H43X8 - परियोजना साइट और G43F5, G43F9, H43X7, H43X8, H43X11 & H43X12 - अध्ययन क्षेत्र.
आठ.	अधिकतम उत्पादन क्षमता	43,35,000 मीट्रिक टन प्रति वर्ष
नौ.	भूवैज्ञानिक खनिज भंडार	49,25,880 मीट्रिक टन
दस.	अवरुद्ध खनिज भंडार	5,90,112 मीट्रिक टन

प्रस्तावक: मैसर्स ऐपेक्स प्रोजेक्ट वर्क्स

सलाहकार: परिवेश पर्यावरण इंजीनियरिंग सेवाएं (एनएबीईटी / ईआईई 5052124 / आईए 0092 (रेव.01))

पृष्ठ 2

यमुना नदी (Chandhut साउथ यूनिट) के नदी तल से रेत (लघु खनिज) का खनन, क्षेत्रफल - 98.156 हेक्टेयर, उत्पादन क्षमता - 43,35,000 मीट्रिक टन प्रति वर्ष, स्थान - गांव Chandhut साउथ, तहसील और जिला पलवल और राज्य हरियाणा।

एस. नं.	पैरामीटर	विवरण		
ग्यारह.	खनन योग्य रिजर्व	43,35,768 मीट्रिक टन		
बारह.	भौगोलिक समन्वय	बिन्दु	देशान्तर	अक्षांश
		छाँदहूत साउथ		
		A1	28° 7' 22.4796" N	77° 29' 23.399" E
		B1	28° 7' 15.652" N	77° 29' 21.692" E
		C1	28° 6' 51.324" N	77° 29' 38.139" E
		D1	28° 6' 49.868" N	77° 29' 45.677" E
		E1	28° 6' 46.099" N	77° 29' 50.988" E
		F1	28° 6' 39.589" N	77° 29' 55.700" E
		G1	28° 6' 33.250" N	77° 29' 54.415" E
		H1	28° 6' 25.798" N	77° 29' 51.588" E
		I1	28° 6' 19.887" N	77° 29' 46.534" E
		J1	28° 6' 15.97" N	77° 29' 36.67" E
		L1	28° 6' 22.16" N	77° 29' 24.65" E
		M1	28° 6' 31.708" N	77° 29' 29.316" E
		N1	28° 6' 43.035" N	77° 29' 33.998" E
		N2	28° 6' 45.131" N	77° 29' 32.411" E
		N3	28° 6' 46.154" N	77° 29' 24.476" E
		O1	28° 6' 48.827" N	77° 29' 18.139" E
		O2	28° 6' 52.236" N	77° 29' 14.026" E
		P1	28° 6' 55.886" N	77° 29' 11.661" E
		P2	28° 6' 59.260" N	77° 29' 10.000" E
		Q1	28° 7' 2.766" N	77° 29' 9.457" E
		R1	28° 7' 13.205" N	77° 29' 12.799" E
R2	28° 7' 18.063" N	77° 29' 12.912" E		
S1	28° 7' 22.419" N	77° 29' 12.698" E		
तेरह.	एमएल क्षेत्र की स्थलाकृति	नदी बेड की सर्वोच्च ऊंचाई अत्यंत उत्तर अंत में 127.25 मीटर आरएल और तट शीर्ष स्तर 130.0 मीटर आरएल है, जबकि नदी बेड के अत्यंत दक्षिण अंत में स्तर 124.78 मीटर आरएल है और नदी का तट शीर्ष स्तर 128.17 मीटर आरएल है। छाँदहूत साउथ राजस्व गाँव में यमुना नदी उत्तर से दक्षिण की दिशा में बहती है।		
चौदह.	खनन विधि और प्रौद्योगिकी	नदी तल में 3 मीटर ऊंची एक बेंच बनाकर ओपनकास्ट मशीनीकृत विधि से खनन कार्य किया जायेगा। वर्तमान में कोई मौजूदा गड्ढा नहीं है क्योंकि पिछले कुछ वर्षों से खनन गतिविधियाँ बंद हैं। रेत की खुदाई बैकहो प्रकार के उत्खननकर्ताओं द्वारा सीधे डंपरों/ट्रकों में लोड करके दिल्ली/एनसीआर में और उसके आसपास स्थित उपभोक्ताओं को भेजने के लिए की जाएगी। खनिज की लोडिंग यांत्रिक होगी, जबकि नदी के किनारे से खनिज का परिवहन निजी		

प्रस्तावक: मैसर्स ऐपेक्स प्रोजेक्ट वर्क्स

सलाहकार: परिवेश पर्यावरण इंजीनियरिंग सेवाएं (एनएबीईटी / ईआईईटी / आईईईटी / आईईईटी 124 / आईईईटी 0092 (रेव.01))

पृष्ठ 3

कार्यकारी सारांश।

यमुना नदी (Chandhut साउथ यूनिट) के नदी तल से रेत (लघु खनिज) का खनन, क्षेत्रफल - 98.156 हेक्टेयर, उत्पादन क्षमता - 43,35,000 मीट्रिक टन प्रति वर्ष, स्थान - गांव Chandhut साउथ, तहसील और जिला पलवल और राज्य हरियाणा।

एस. नं.	पैरामीटर	विवरण		
		ट्रक मालिकों के माध्यम से किया जाएगा। उपभोक्ता मांग को पूरा करने के लिए पर्याप्त मात्रा में रेत का भंडार उपलब्ध है।		
पंद्रह.	खनन की अंतिम गहराई	यमुना नदी के किनारे से 3 मीटर की दूरी पर		
सोलह.	भूजल स्तर	सतह तल से 05 - 10 मीटर		
सत्रह.	भूजल स्तर प्रतिच्छेदन	खनन सतह से केवल 3 मीटर तक किया जाएगा। इसलिए, भूजल स्तर को प्रतिच्छेद नहीं किया जाएगा।		
अठारह.	जल निकासी पैटर्न/	खनन सूखी नदी के तल में किया जाएगा; धारा को छुआ नहीं जाएगा और केवल गैर-मानसून अवधि के दौरान किया जाएगा।		
उन्नीस.	पानी की आवश्यकता और स्रोत	पानी का स्रोत निजी पानी के टैंकर हैं। पानी की आवश्यकता का विवरण इस प्रकार है:		
		एस. नं.	विवरण	अपेक्षा होना
		1	धूल का दमन	16.10 KLD
		2	ग्रीनबेल्ट विकास	13.70 KLD
		3	घरेलू आवश्यकता	7.90 KLD
	कुल	37.70 KLD 38.00 KLD		
बीस.	परियोजना की लागत	परियोजना के लिए पूंजीगत लागत 17 करोड़ रुपये होगी, जिसमें प्रस्तावित पट्टा क्षेत्र और मशीनरी को अनुबंध आधार पर किराए पर लिया जाएगा।		

स्रोत: अनुमोदित खनन योजना

विकल्प का विश्लेषण

यह नए खदान पट्टे का मामला है। खनिज साइट विशिष्ट है, इसलिए कोई वैकल्पिक साइट की पहचान नहीं की गई थी। संबंधित प्राधिकारी से पट्टा अनुमोदन प्राप्त कर लिया गया है और रिपोर्ट में संलग्न कर दिया गया है।

आधारभूत वातावरण का विवरण

ईआईए अध्ययन तैयार करने के लिए दिशानिर्देशों के अनुसार प्री-मॉनसून सीजन यानी मार्च से मई 2024 के दौरान पर्यावरणीय डेटा एकत्र किया गया है।

प्रस्तावक: मैसर्स ऐपेक्स प्रोजेक्ट वर्क्स

सलाहकार: परिवेश पर्यावरण इंजीनियरिंग सेवाएं (एनएबीईटी / ईआईई 5072124 / आईए 0092 (रेव.01))

पृष्ठ 4

यमुना नदी (Chandhut साउथ यूनिट) के नदी तल से रेत (लघु खनिज) का खनन, क्षेत्रफल - 98.156 हेक्टेयर, उत्पादन क्षमता - 43,35,000 मीट्रिक टन प्रति वर्ष, स्थान - गांव Chandhut साउथ, तहसील और जिला पलवल और राज्य हरियाणा।

सारणी 2: आधारभूत स्थिति

पैरामीटर	आधारभूत स्थिति
परिवेशी वायु गुणवत्ता	पार्टिकुलेट मैटर: पीएम 10 73 $\mu\text{g} / \text{m}^3$ से 89 $\mu\text{g} / \text{m}^3$ तक भिन्न होता है। PM2.5 20 $\mu\text{g}/\text{m}^3$ से 38 $\mu\text{g}/\text{m}^3$ देखा गया। गैसीय प्रदूषक: SO2 9.4 $\mu\text{g}/\text{m}^3$ से 14.9 $\mu\text{g} / \text{m}^3$ तक भिन्न था। अध्ययन क्षेत्र में NOx 14.0 $\mu\text{g}/\text{m}^3$ से 19.3 $\mu\text{g}/\text{m}^3$ देखा गया। अध्ययन क्षेत्र में सीओ 1.01 मिलीग्राम / एम ³ से 1.47 मिलीग्राम / एम ³ तक देखा गया था।
शोर का स्तर	सभी स्थानों पर दिन के दौरान दर्ज किया गया ध्वनि स्तर 50.8 डीबी (ए) से 51.8 डीबी (ए) तक भिन्न होता है और रात के समय में यह 33.1 डीबी (ए) से 36.4 डीबी (ए) के बीच भिन्न होता है।
भूजल	सभी मानकों को अधिकांशतः स्वीकार्य सीमा से अधिक पाया गया लेकिन पेयजल मानक 10500:2012 के लिए अनुमेय सीमा के भीतर पाया गया। पीएच (7.1 से 7.85), टीडीएस (789 मिलीग्राम/लीटर से 851 मिलीग्राम/लीटर), क्षारीयता (219.5 मिलीग्राम/लीटर से 274.3 मिलीग्राम/लीटर), कुल कठोरता (287.5 मिलीग्राम/लीटर से 309.6 मिलीग्राम/लीटर), कैल्शियम के रूप में सीए (61.9 मिलीग्राम/लीटर से 74.8 मिलीग्राम/लीटर), मैग्नीशियम (31.8 मिलीग्राम/लीटर से 36.4 मिलीग्राम/लीटर), Chloride (241.9 mg/l to 262.9 mg/l) & Sulphate (39.8 mg/l to 59.6 mg/l) का विश्लेषण किया गया।
सतही जल	पीएच 7.36 से 8.14 के बीच भिन्न था। स्रोतों की घुलित ऑक्सीजन 6.0 मिलीग्राम/लीटर से 6.5 मिलीग्राम/लीटर के बीच भिन्न थी। बीओडी 32.6 मिलीग्राम/लीटर से 42.6 मिलीग्राम/लीटर के बीच देखा गया। खराब गुणवत्ता के कारण पानी उपयोग करने योग्य नहीं था।
मिट्टी की गुणवत्ता	अध्ययन क्षेत्र में मिट्टी मुख्यतः दोमट थी। पीएच 7.2 से 7.9 के बीच था। चालकता 337 $\mu\text{mhos}/\text{cm}$ से 416 $\mu\text{mhos}/\text{cm}$ तक भिन्न थी। कार्बनिक कार्बन 0.59% से 0.78% तक भिन्न था। नाइट्रोजन 134 किलोग्राम प्रति हेक्टेयर से लेकर 171 किलोग्राम प्रति हेक्टेयर तक था। फॉस्फोरस 12 किलोग्राम प्रति हेक्टेयर से 24 किलोग्राम प्रति हेक्टेयर तक भिन्न था। पोटेशियम 128 किलोग्राम प्रति हेक्टेयर से लेकर 164 किलोग्राम प्रति हेक्टेयर तक था। भारी धातुओं का भी विश्लेषण किया गया। कुल मिलाकर, मिट्टी की गुणवत्ता अच्छी थी, जिसमें अच्छा थोक घनत्व और अच्छी नमी सामग्री थी जो यमुना नदी के बेसिन के कारण हो सकती है।
मौसम-विज्ञान	अध्ययन अवधि के दौरान अधिकतम तापमान मई के महीने में 45.3°C और मार्च के महीने में न्यूनतम तापमान 14.4°C दर्ज किया गया। अध्ययन क्षेत्र में अप्रैल माह में उच्चतम आरएच 79.7% पाया गया, जबकि मार्च माह में न्यूनतम मासिक औसत आरएच 45.5% पाया गया। हवा की औसत गति 2.8 मीटर/सेकंड दर्ज की गई। अध्ययन अवधि के दौरान प्रमुख हवा की दिशा मुख्य रूप से दक्षिण-पश्चिम से उत्तर-पूर्व और उसके बाद उत्तर-पूर्व से दक्षिण-पश्चिम थी।

प्रस्तावक: मैसर्स ऐपेक्स प्रोजेक्ट वर्क्स

सलाहकार: परिवेश पर्यावरण इंजीनियरिंग सेवाएं (एनएबीईटी / ईआईई 5082124 / आईए 0092 (रेव.01))

पृष्ठ 5

यमुना नदी (Chandhuth साउथ यूनिट) के नदी तल से रेत (लघु खनिज) का खनन, क्षेत्रफल - 98.156 हेक्टेयर, उत्पादन क्षमता - 43,35,000 मीट्रिक टन प्रति वर्ष, स्थान - गांव Chandhuth साउथ, तहसील और जिला पलवल और राज्य हरियाणा।

प्रत्याशित पर्यावरणीय प्रभाव और शमन उपाय

प्रस्तावित खनन प्रचालनों से प्रदूषकों की सघनता निर्धारित सीमा से अधिक बढ़ने का अनुमान नहीं है। पहचाने गए प्रभाव और शमन उपाय नीचे दिए गए हैं।

- ✓ इस खनन गतिविधि के कारण मौजूदा यातायात में कुल 1,941 पीसीयू / दिन की वृद्धि होगी, इसलिए वाहनों से ध्वनि हो सकती है और परिवहन मार्ग के पास ग्रामीणों के मानव स्वास्थ्य पर भी प्रभाव डाल सकती है जैसे कि सांस लेने और श्वसन संबंधी मुद्दों पर प्रभाव। वाहनों की तेज गति के कारण दुर्घटनाएं हो सकती हैं। ट्रक की आवाजाही सुझाए गए परिवहन मार्ग से ही होगी। 13,710 पौधे लगाने का प्रस्ताव है। योजना अवधि में संयंत्रों की संख्या और प्रभाव को कम करने के लिए दिन में दो बार पानी का छिड़काव किया जाएगा।
- ✓ मशीनरी को अच्छी चलने की स्थिति में बनाए रखा जाएगा ताकि शोर को न्यूनतम संभव स्तर तक कम किया जा सके। पीयूसी सर्टिफिकेट वाले वाहनों को किराए पर लिया जाएगा। वाहनों के सुचारू संचालन को सुनिश्चित करने के लिए वाहनों का नियमित रखरखाव किया जाएगा। कामगारों को अनुमेय ध्वनि स्तर और उन स्तरों के अधिकतम संपर्क के प्रभाव के बारे में जागरूकता प्रदान की जाएगी। इसके साथ ही ट्रक चालकों को निर्देश दिए जाएंगे कि वे गांव क्षेत्र और संवेदनशील क्षेत्रों में हॉर्न का कम से कम इस्तेमाल करें।
- ✓ भूजल स्तर पर कोई प्रभाव नहीं पड़ेगा क्योंकि खनन केवल 3 मीटर तक सीमित होगा और परियोजना स्थल का जल स्तर सतह से 5-10 मीटर है। इसलिए, पानी पर किसी प्रभाव की पहचान नहीं की गई थी। प्रस्तावित खनन गतिविधि से केवल 1.6 केएलडी सैनिटरी अपशिष्ट जल उत्पन्न किया जाएगा जिसे सेप्टिक टैंकों में उपचारित किया जाएगा और वृक्षारोपण उद्देश्य के लिए उपयोग किया जाएगा।
- ✓ खदान श्रमिक प्रति दिन लगभग 42 किलोग्राम नगरपालिका ठोस अपशिष्ट उत्पन्न करेगा, जिसका मानव स्वास्थ्य पर प्रतिकूल प्रभाव पड़ेगा। घरेलू कचरा संग्रह के लिए 10 कूड़ेदान उपलब्ध कराए जाएंगे। नदी के किनारे के क्षेत्र में खनन के कारण कोई बोझ नहीं होगा।
- ✓ खनन गतिविधियों को सड़क के बुनियादी ढांचे और वाहन परिवहन को बनाए रखते हुए व्यवस्थित तरीके से किया जाएगा, जो क्षेत्र में स्थलाकृति और जल निकासी के संरक्षण के लिए एक सुरक्षात्मक उपाय होगा।
- ✓ खनन या सहायक क्षेत्र में कोई मानव बस्ती प्रस्तावित नहीं है। स्थानीय जनशक्ति को प्राथमिकता दी जाएगी।
- ✓ जलीय जीवन पर प्रभाव को कम करने के लिए बरसात के मौसम के दौरान कोई खनन नहीं किया जाएगा।
- ✓ फील्ड सर्वेक्षण के अनुसार, निवासियों के साक्षात्कार और वन विभाग से अधिप्रमाणित चेकलिस्ट प्रस्तावित खान पट्टा क्षेत्र के अध्ययन क्षेत्र के बफर क्षेत्र में 06 अनुसूची-I प्रजातियों की उपस्थिति को इंगित करती है। इसलिए, इन अनुसूची-I प्रजातियों के संरक्षण के लिए, भविष्य के दृष्टिकोण के साथ एक विस्तृत संरक्षण योजना प्रस्तावित है। इसी संरक्षण योजना के लिए वारनस बेंगालेंसिस (कॉमन इंडियन मॉनिटर छिपकली), नजा नाजा (इंडियन कोबरा), प्टियास म्यूकोसा (रैट स्नेक), पावो क्रिस्टेटस (भारतीय मोर), हर्पीसएडवर्डसी (कॉमन नेवला) और फेलिस चौस (जंगल कैट) हैं। इसके बाद, वन्यजीव प्रजातियों के संरक्षण के लिए 34 लाख रुपये का बजट आवंटित किया गया है।

प्रस्तावक: मैसर्स ऐपेक्स प्रोजेक्ट वर्क्स

सलाहकार: परिवेश पर्यावरण इंजीनियरिंग सेवाएं (एनएबीईटी / ईआईई 5092124 / आईए 0092 (रेव.01))

पृष्ठ 6

यमुना नदी (Chandhut साउथ यूनिट) के नदी तल से रेत (लघु खनिज) का खनन, क्षेत्रफल - 98.156 हेक्टेयर, उत्पादन क्षमता - 43,35,000 मीट्रिक टन प्रति वर्ष, स्थान - गांव Chandhut साउथ, तहसील और जिला पलवल और राज्य हरियाणा।

- ✓ रेत के खनन से स्थानीय लोगों की प्रति व्यक्ति आय में वृद्धि होने की संभावना है जिसके द्वारा लोगों की सामाजिक आर्थिक स्थिति में सुधार होगा। स्थानीय लोगों को या तो प्रत्यक्ष रोजगार या अप्रत्यक्ष रोजगार जैसे व्यवसाय, ठेका कार्य और विकास कार्य जैसे सड़क आदि और अन्य कल्याणकारी सुविधाएं जैसे चिकित्सा सुविधाएं, वाहन, मुफ्त शिक्षा, पेयजल आपूर्ति आदि प्रदान की गई हैं।
- ✓ धूल उत्पादन को छोड़कर, ऐसा कोई स्रोत नहीं है जो स्वास्थ्य संबंधी बीमारियों की संभावना दिखा सके। स्प्रिंकलर माउंटेड टैंकों के साथ नियमित रूप से पानी का छिड़काव किया जाएगा और श्रमिकों को डस्ट मास्क प्रदान किए जाएंगे।
- ✓ व्यक्तिगत सुरक्षा उपकरण शोर जोखिम को रोकने के लिए प्रदान करेंगे। खनन गतिविधि के दौरान व्यक्तिगत सुरक्षा उपकरण प्रदान किए जाएंगे। नियमित स्वास्थ्य जांच शिविरों का आयोजन किया जाएगा। सभी श्रमिकों का नियोक्ता द्वारा बीमा किया जाएगा।

पर्यावरण निगरानी कार्यक्रम

निर्धारित मानकों के भीतर पर्यावरणीय गुणवत्ता बनाए रखने के लिए, विभिन्न पर्यावरणीय घटकों की नियमित निगरानी आवश्यक है जो शर्तों के अनुसार अनुपालन किया जाएगा। इसके लिए पट्टेदार ने खान की पर्यावरण नीति बनाने और एक पर्यावरण प्रबंधन प्रकोष्ठ का गठन करने का निर्णय लिया है और अनुमोदित पर्यावरण नीति में उल्लिखित उद्देश्यों के साथ प्रस्तावित खान को संचालित करने के लिए प्रतिबद्ध है। वायु, जल, शोर और मिट्टी की निगरानी के लिए 60.0 हजार रुपये वार्षिक बजट होगा जो खनन गतिविधि के दौरान प्रदूषण की रोकथाम के उपायों को शुरू करने के लिए परियोजना प्रस्तावक द्वारा वहन किया जाना है।

अतिरिक्त अध्ययन

खनन योजना के तहत किए गए प्रस्ताव के अनुसार इस क्षेत्र को ओपनकास्ट खनन विधि के माध्यम से विकसित किया जाएगा। खनन प्रक्रिया के दौरान जल स्तर को नहीं छुआ जाएगा। भूस्खलन, धंसाव, बाढ़ आदि जैसी किसी उच्च जोखिम वाली दुर्घटना की आशंका नहीं है।

सुरक्षा, स्वास्थ्य और पर्यावरण (एसएचई) नीति मौजूदा है और साइट पर सभी और अन्य हितधारकों के लिए सुलभ है। नीति विधायी अनुपालन, हितधारक भागीदारी, निरंतर सुधार और उद्देश्यों द्वारा प्रबंधन पर विचार करते हुए तैयार की गई है।

स्वास्थ्य पर पड़ने वाले प्रभावों को कम करने के लिए पीपीई जैसे डस्ट मास्क, ईयर प्लग/मफ और अन्य उपकरण कर्मियों द्वारा उपयोग के लिए प्रदान किए जाएंगे। नियुक्ति के समय खान नियम 1955 के अनुसार सभी श्रमिकों की प्रारंभिक चिकित्सा जांच की जाएगी। आवधिक चिकित्सा परीक्षा पांच साल में कम से कम एक बार आयोजित की जाएगी। प्रस्तावक द्वारा छः मासिक चिकित्सा शिविरों का आयोजन किया जाएगा।

परियोजना क्षेत्र के भीतर और आस-पास के क्षेत्र में आबादी का कोई विस्थापन नहीं है। मेरा यह काम अधिक रोजगार प्रदान करेगा, आस-पास की कुछ आबादी को मौका देगा, यह हमेशा स्पष्ट है कि सुरक्षित खनन गतिविधि निवासियों की सामाजिक-आर्थिक स्थितियों में सुधार करने में मदद करेगी।

प्रस्तावक: मैसर्स एपेक्स प्रोजेक्ट वर्क्स

सलाहकार: परिवेश पर्यावरण इंजीनियरिंग सेवाएं (एनएबीईटी / ईआईई / 02124 / आईए 0092 (रेव.01))

पृष्ठ 17

यमुना नदी (Chandhut साउथ यूनिट) के नदी तल से रेत (लघु खनिज) का खनन, क्षेत्रफल - 98.156 हेक्टेयर, उत्पादन क्षमता - 43,35,000 मीट्रिक टन प्रति वर्ष, स्थान - गांव Chandhut साउथ, तहसील और जिला पलवल और राज्य हरियाणा।

परियोजना का लाभ

परियोजना प्रस्तावक अपनी सामाजिक जिम्मेदारी के प्रति जागरूक हैं और किसी भी अच्छे कॉर्पोरेट नागरिक के रूप में; आवश्यकता विशिष्ट (कुशल और गैर-कुशल) रोजगार शुरू करने का प्रस्ताव है। यह परियोजना स्थानीय लोगों को प्रत्यक्ष और अप्रत्यक्ष रूप से रोजगार प्रदान करेगी। अप्रत्यक्ष नियोक्ता दुकानदार, मैकेनिक, ड्राइवर, ट्रांसपोर्टर आदि हैं। लगभग 175 व्यक्तियों को प्रत्यक्ष रोजगार और 30 व्यक्तियों को आस-पास के गांवों से अप्रत्यक्ष रोजगार मिलेगा। श्रमिक ज्यादातर कुशल होंगे।

डेवलपर मानदंडों के अनुसार ईएसआर कार्यक्रम को भी 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 की जाएगी।
- ✓ स्थानीय लोगों को प्राथमिकता देते हुए उनके रोजगार के लिए एक अच्छी तरह से निर्धारित योजना तैयार की गई है।
- ✓ ग्रामीण आबादी के बीच स्वास्थ्य निगरानी शिविरों, सामाजिक कल्याण और विभिन्न जागरूकता कार्यक्रमों में सरकार के प्रयासों को पूरा करना।
- ✓ सामाजिक वृक्षारोपण कार्यक्रम में सहायता करना।
- ✓ गांवों के भीतर सड़कों आदि जैसी सुविधाओं का विकास।

पर्यावरण प्रबंधन योजना की लागत

पर्यावरण प्रबंधन के लिए विस्तृत गतिविधि-वार गणना की गई है जो क्रमशः पूंजीगत लागत के रूप में INR 18.50 लाख और आवर्ती लागत के रूप में INR 5.80 लाख प्रति वर्ष है। योजना अवधि के लिए डेवलपर द्वारा पर्यावरण माप के लिए 47.50 लाख रुपये का कुल बजट सुनिश्चित किया गया है।

समाप्ति

उपर्युक्त चर्चा के अनुसार खनिज और परिवहन के लदान, उतराई के दौरान उत्सर्जन को छोड़कर खनन के कारण पर्यावरण पर कोई बड़ा प्रभाव नहीं पड़ता है। विभिन्न प्रदूषकों को अनुमेय सीमा के भीतर रखने के लिए पर्याप्त निवारक उपाय अपनाए जाएंगे। रखरखाव और बाड़ लगाने सहित लगभग 13,710 पौधे लगाने और 1000/पौधे को ध्यान में रखते हुए गैप प्लांटेशन का प्रस्ताव है। यह एक प्रभावी प्रदूषण कम करने वाली तकनीक साबित होगी और मानसून के मौसम के दौरान मिट्टी के क्षरण से बचने में मदद करेगी। स्थानीय लोगों को रोजगार के अवसर केवल प्रदान किए जाएंगे क्योंकि खदान स्थल से खनिजों का निष्कर्षण प्रदान करना उनके लिए उनकी आजीविका के लिए एकमात्र प्रचलित व्यवसाय है। खदान परिसर, संपर्क मार्गों, सरकारी भवनों, स्कूलों के आसपास लगभग पौधारोपण विकास किया जाएगा।

प्रस्तावक: मैसर्स ऐपेक्स प्रोजेक्ट वर्क्स

सलाहकार: परिवेश पर्यावरण इंजीनियरिंग सेवाएं (एनएबीईटी / ईआईईटी) 12124 / आईए 0092 (रेव.01))

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