BEFORE THE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

ORIGINAL APPLICATION NO. 556/2023

IN THE MATTER OF:

ARUN TIWARI ……APPLICANT(s)

VERSUS

STATE OF U.P.

……..RESPONDENT(s)

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THROUGH COUNSEL

BHANWAR PAL SINGH JADON
COUNSEL UTTAR PRADESH POLLUTION CONTROL BOARD
EMAIL- bhanwar09jadon@gmail.com
Ph: 9639286572

DATE: 18.03.2025

PLACE: JHANSI

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI
ORIGINAL APPLICATION NO. 556/2023

IN THE MATTER OF:

ARUN TIWARI .....**APPLICANT**

VERSUS

STATE OF UTTAR PRADESH .....**RESPONDENT(s)**

COMPLIANCE AFFIDAVIT ON BEHALF OF UTTAR PRADESH POLLUTION CONTROL BOARD IN COMPLIANCE OF THE ORDER DT. 28.11.2024 PASSED BY THE HON'BLE NATIONAL GREEN TRIBUNAL, NEW DELHI

I, Imraan Ali, aged about 45 years, S/o Mr. Usman Ali, R/o Mohalla- Qaboolpura, Tehsil-Sadar, District Badaun, posted as Regional Officer, Uttar Pradesh Pollution Control Board, Jhansi do hereby solemnly affirm and state as under:

1. That I, the Deponent in the above captioned matter am fully conversant with the facts of the case and am competent and authorized to swear the present affidavit.

2. That I state that the contents of the affidavit have been drafted by my counsel on my instructions and the contents of the same are true to my knowledge and nothing material has been concealed therefrom.

3. That in the present matter, the issue pertains to the illegal mining of soil upto the depth of 10-15 meters from the farmer's land by the Project Proponent during the course of construction of Bundelkhand Expressway project in collusion with the officers of UPEIDA. The allegation of the applicant is that on account of said illegal mining, not only the quality of road has suffered but illegally dug up pits are becoming a hazard, and illegal mining in the fields of agriculturists has been done even without their permission.

4. That the above captioned matter was last listed for hearing on 28.11.2024, wherein the Hon'ble Tribunal directed as under:

".....8. Learned Counsel for UPPCB is not aware of the issuance of any of the notices by the UPPCB. It is unfortunate that CPCB has placed on record the notices issued by the UPPCB, but the Counsel for the UPPCB is not aware of the notices which are issued by UPPCB, nor he has any instruction in this regard. In these circumstances, we require the Member Secretary, UPPCB to appear virtually and appraise the Tribunal about the action taken on the next date of hearing....."

5. That in compliance of the aforementioned directions, the compliance affidavit on behalf Uttar Pradesh Pollution Control Board is as under.

6. That it is pertinent to submit that the Central Pollution Control Board (CPCB), vide its letter dated 28.10.2024, has issued directions to the Uttar Pradesh Pollution Control Board (UPPCB) under Section 18(1)(b) of the Water Act, 1974 and the Air Act, 1981. That vide the said letter, the UPPCB was directed to:

"i. to get assessed the extent of illegal mining at all mining sites from which ordinary earth/soil has been mined for the said expressway construction work in Jalaun district;

ii. to initiate actions immediately for appropriate punitive action as applicable under the law, including levying and realisation of environmental compensation, for violation of provisions of environmental laws as mentioned in above paragraphs, after duly following the principle of natural justice;

iii. to take all necessary actions to ensure that no further illegal mining takes place, and;

iv. to get prepared a remediation plan by the project proponent for the illegal mining sites where illegal mining has taken place for the said expressway construction work in Jalaun district, in consultation with mining department and UPPCB, and get it implemented by the project proponent in a time bound manner."

A Copy of the letter dt. 28.10.2024 has been annexed herewith as **ANNEXURE A-1.**

7. That in compliance of the aforementioned directions of the CPCB, the UPPCB has written letters dt. 06.11.2024 and 14.11.2024 to the District Mining Officer, Orai, Jalaun. That vide the said letters it was requested to the Mining Department to provide a report for the extent of illegal mining at the sites where ordinary earth/soil was excavated for the Bundelkhand Expressway construction in the Jalaun district, to enable the UPPCB to initiate further necessary action.

Copies of the letters dt. 06.11.2024 and 14.11.2024 have been annexed herewith as **ANNEXURE A-2(Colly).**

8. That further it is to be stated that in response to the aforementioned letters, the District Mining Officer vide letter dt. 16.11.2024 has informed the UPPCB that contract was executed between UPEIDA and M/s Gawar Construction Limited on 15.01.2020 for the construction of the Bundelkhand Expressway. Further it was informed vide the said letter that the soil mining upon 32 sites for the Bundelkhand Expressway construction took place from 15.01.2020 to 31.12.2022. That the details of the 32 sites were disclosed with the said letter. Subsequently, the Regional Officer has written a letter dt. 18.11.2024 to the Chief Environmental Officer (Region-2), U.P. Pollution Control Board, Lucknow. That the said letter states that that Project Proponent operated without prior consent and engaged in illegal soil mining for 1066 days, from 15.01.2020 to 31.12.2022.

   A Copy of the letters dt. 16.11.2024 and 18.11.2024 has been annexed herewith as **ANNEXURE A-3.**

   A Copy of the contract dt. 15.01.2020 has been annexed herewith as **ANNEXURE A-4.**

9. That furthermore, the UPPCB has issued a show cause notice dt. 21.11.2024 to the Project Proponent. That the said notice states that according to the guidelines issued by the Central Pollution Control Board for calculating environmental compensation, the environmental damage cost is determined at Rs. 12,500/- per day using the formula:

   Penalty (P) = Bl (Baseline Pollution) x N (Number of days) x R (Penalty Rate) x S (Scale Factor) x LF (Location Factor)

   Where:

   - Bl (Baseline Pollution Index) = 50
   - R (Penalty in ₹) = 250
   - S (Scale of Operation, Medium) = 1.0
   - LF (Location Factor) = 1.0

Based on this calculation, the total environmental compensation for 1066 days at Rs. 12,500/- per day amounts to Rs. 1,33,25,000/- (One Crore Thirty-Three Lakh Twenty-Five Thousand Rupees only).

Therefore, vide the said notice the Project Proponent was directed to submit their explanation within 15 days from the receipt of the said notice. That the said notice further stated that in the event of failure to provide a satisfactory response within the stipulated time, an environmental compensation of Rs. 1,33,25,000/- (One Crore Thirty-Three Lakh Twenty-Five Thousand Rupees only) would be imposed upon the Project Proponent.

A Copy of the Show Cause Notice dt. 21.11.2024 has been annexed herewith as **ANNEXURE A-5.**

A Copy of the CPCB guidelines has been annexed herewith as **ANNEXURE A-6.**

10. That it is germane to submit that the UPPCB as written a letter dt. 26.11.2024 to the District Mining Officer, Jalaun. That the said letter states that Mining Department has only provided the details of only 32 sites vide letter dt. 16.11.2024. Therefore, it was requested to the District Mining Officer, Jalaun vide the said letter to assess the extent of illegal mining at all sites where soil excavation was carried out for the Bundelkhand Expressway construction in Jalaun district and submit the complete report to the UPPCB.

A Copy of the letter dt. 26.11.2024 has been annxed herewith as **ANNEXURE A-7.**

11. That in response of the aforementioned letter dt. 26.11.2024, the Mining Department has written a letter dt. 13.12.2024 to the UPPCB. That vide the said letter a complete assessment report of all the sites where soil

excavation was carried out for the Bundelkhand Expressway construction was provided.

A Copy of the letter dt. 13.12.2024 has been annexed herewith as **ANNEXURE A-8.**

12. That it is to be submitted that Regional Officer, UPPCB has written a recommendation letter dt. 30.01.2025 to the Chief Environmental Officer (Zone-2), Lucknow. That vide the said letter it was recommended that an environmental compensation of Rs. 1,33,25,000/- be imposed upon the Project Proponent for the violation period of 1,066 days (15.01.2020 – 31.12.2022).

A Copy of the letter dt. 30.01.2025 has been annexed herewith as **ANNEXURE A-9.**

13. That it pertinent to submit that the UPPCB has also directed the Project Proponent vide another letter dt. 26.11.2024 to submit time bound action plan within 15 days in coordination with Mining Department and UPPCB on remediation of all illegal mining sites related to Bundelkhand Expressway construction in Jalaun district.

A Copy of the letter dt. 26.11.2024 has been annexed herewith as **ANNEXURE A-10.**

14. That in compliance of the aforementioned letter dt. 26.11.2024, the Project Proponent vide letter dt. 30.01.2025, has submitted a time bound remediation plan for the 32 excessive mining sites.

A Copy of the letter dt. 30.01.2025 has been annexed herewith as **ANNEXURE A-11**

A Copy of the Remediation Plan has been annexed herewith as **ANNEXURE A-12.**

15. That further the Project Proponent has submitted another response to the Show Cause Notice dt. 21.11.2024 vide letter dt. 20.02.2025, wherein the following submissions were made by the Project Proponent:

- That the Project Proponent had obtained necessary Consents to Establish (CTEs) and Consents to Operate (CTOs) for the Hot Mix Plant and Ready Mix Plant installed for Package IV of the Bundelkhand Expressway, covering Barali Kharka (District Hamirpur) to Saalabad (District Jalaun) (KM 149+0 to 200-000).
- As per Specific Condition No. 52 of the Environmental Clearance (EC) obtained by UPEIDA, it was required that a separate NOC and consent be obtained from UPPCB for asphalt plants, crushers, batching plants, and hot mix plants.
- The Project Proponent, as a contractor of UPEIDA, had obtained the necessary NOCs and consents from UPPCB for the aforementioned facilities.
- The Project Proponent argued that it had complied with Mining Rules, caused no environmental degradation, and that UPEIDA, as the project proponent, had already obtained Environmental Clearance (EC).

A Copy of the letter dt. 20.02.2025 has been annexed herewith as **ANNEXURE A-13.**

16. That upon reviewing the aforementioned submissions of the Project Proponent in the letter dt. 20.02.2025, it is evident that the Project Proponent had failed to obtain consent from UPPCB under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 for soil mining conducted for expressway construction. Therefore, the said response from the Project Proponent was found to be unsatisfactory. Henceforth, the

UPPCB vide letter dt. 10.03.2025, imposed an environmental compensation of Rs. 1,33,25,000/- (Rupees One Crore Thirty-Three Lakh Twenty-Five Thousand Only) upon the Project Proponent and directed the Project Proponent to deposit the said environmental compensation within 15 days.

A Copy of the Letter dt. 10.03.2025 has been annexed herewith as **ANNEXURE A-14.**

17. That in light of the above, the UPPCB has ensured necessary compliance in strict adherence to the directions issued by the Hon'ble Tribunal

18. Hence, the present affidavit is being submitted for the kind perusal of this Hon'ble Tribunal. It is prayed that the same be taken on record.

DEPONENT

VERIFICATION

Verified at Jhansi on this 18th day of March, 2025, that the contents of the above affidavit from paragraphs 1 to 17 are believed to be true and correct to the best of my knowledge and belief. No part of it is false and nothing material has been concealed therefrom.

DEPONENT

NOTARY Prakash Narain Dwivedi H.C. Jhansi

Serial No. 234 Date 18-3-25.
Certified that the foregoing statement
sworn before me this day at
by shri/smt./kum.
whom the contents of the affidavit have
been read out and explained which is
identified by Shri
Received the legal fee Rs. 50.00 Cash

Regional Officer U.P. Pollution Control Board, Jhansi

PRAKASH NARAIN DWIVEDI
ADVOCATE
NOTARY JHANSI (U.P.)

18.3.25

Annexure -1

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA

EMAIL/SPEED POST

CM-13011/110/2024-LAW-HO-CPCB-HO/5802

October 28, 2024

To

The Member Secretary
UP Pollution Control Board
Building.No. TC-12V, Vibhuti Khand
Gomti Nagar, Lucknow- 226010

Sub: Directions under section 18(1) (b) of the Water (Prevention & Control of Pollution) Act, 1974, and the Air (Prevention & Control of Pollution) Act, 1981 in matter related to O.A. No. 556 of 2023 (Arun Tiwari Versus State of Uttar Pradesh & Ors.) - reg.

WHEREAS, amongst others, under Section 17 of the Water (Prevention & Control of Pollution) Act, 1974, and Section 17 of the Air (Prevention & Control of Pollution) Act, 1981, one of the functions of the State Pollution Control Board (SPCB) / Pollution Control Committee (PCC) is to plan a comprehensive programme for prevention, control or abatement of pollution of streams and wells and to plan a comprehensive programme for prevention, control or abatement of air pollution in the State/Union Territory and to secure the execution therefore; and

WHEREAS, under section 17 sub-section (1) clause (o) of the Water (Prevention & Control of Pollution) Act, 1974, (hereinafter referred to as Water Act, 1974) and with similar provision under section 17 sub- section (1) clause (i) of the Air (Prevention & Control of Pollution) Act, 1981, (hereinafter referred to as Air Act, 1981), one of the functions of the State Pollution Control Board (UPPCB) constituted under the Water Act, 1974, is to perform such functions as may be prescribed or as may, from time to time entrusted to it by the Central Pollution Control Board; and

WHEREAS, under provisions of the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act), the States Governments are empowered to make rules for regulating the grant of prospecting licenses / mining leases in respect of minor minerals and to make rules for preventing illegal mining, transportation and storage of minerals. All such mining which qualifies under illegal, are to be dealt with according to the provision of MMDR Act by the Mining Department.

WHEREAS, the Central Government had issued Environmental Impact Assessment (EIA) Notification 1994 and 2006 and by virtue of these notifications, the Central Government has made it mandatory to obtain prior Environmental Clearance for projects/activities covered under the Schedule of the notification from Central Government / State Environmental Impact Assessment Authority (SEIAA), including highway projects.

WHEREAS, CPCB has categorized industrial sectors into Red, Orange, Green and White categories and directed all SPCBs/PCCs on 07.03.2016 for its adoption and implementation. The SPCBs/PCCs were also directed that addition of new of left-over

industrial sectors and their categorization which is not listed in the categorization done by CPCB, shall be done by a committee at the level of concerned SPCB/PCC, in accordance with the revised criteria and guidelines of CPCB. Highway project are included in the Orange category in the said categorisation; and

WHEREAS, in the project of Uttar Pradesh Expressways Industrial Development Authority (UPEIDA) of 297 km long Bundelkhand Expressway between Gonda village on NH-35 in Chitrakoot district and Kudrail village on Agra-Lucknow Expressway in Etawah district in six packages, The construction work was awarded to four different contractors. About 75 km length in two tehsils - Orai and Jalaun of Jalaun district has been constructed by M/s Gawar Construction Limited, Gurgaon

WHEREAS, in compliance to Hon'ble NGT order dated 06.05.2024 (in O.A. 556 of 2023), a team of CPCB along with officials from UPPCB, UPEIDA, Mining Department (Govt. of UP), and Lekhpal of the concerned area, carried out inspection of the ordinary earth/soil mining sites related to the said expressway construction work in Jalaun District on 03.07.2024 and 04.07.2024 to verify the factual status in respect of the complaint in the said O.A. 556 of 2023. The salient observations made by the inspecting team about the expressway construction project are as follows:

1. State Environmental Impact Assessment Authority (SEIAA) Uttar Pradesh issued Terms of Reference (TOR) to UPEIDA for construction of the Bundelkhand Expressway on 10.05.2019 and subsequently issued Environmental Clearance for the project on 23.11.2019.
2. Approximately 75 Km of Bundelkhand Expressway is constructed in two tehsils (Orai & Jalaun) of district Jalaun under Package IV and V. M/s Gawar Construction Limited, Gurgaon started work on 15.01.2020 and completed construction work on 30.06.2022 for Package IV and on 26.07.2022 for Package V.
3. UPPCB granted Consent to Establish under the Water Act, 1974 and the Air Act,1981 on 18.05.2020 for Hot Mix Plant and Ready-Mix Concrete Plant of M/s Gawar Construction Limited, Gurgaon and granted Consent to Operate for these plants on 31.10.2020 for the duration of 23.10.2020 to 31.07.2022.

WHEREAS, the CPCB team reported following violations regarding the ordinary earth/soil mining carried for the said expressway construction work in Jalaun district:

1. Mining Department, Jalaun granted 162 mining permissions (with 889 mining pits) in 79 villages in district Jalaun to M/s Gawar Construction Limited for mining of soil (total area- 2336.46 acres and total quantity- 17001696 m3) for Package IV & V of the project. These mining permissions were granted between December, 2020 to April, 2022. Whereas, UPEIDA had mentioned name of 14 villages in Jalaun District for borrow of soil in final EIA report..
2. Mining Department, Jalaun did not provide details of actual quantity of soil excavated during construction of Bundelkhand Expressway in Jalaun District.
3. CPCB team visited 39 mining permission area (with 157 mining pits) and observed the depth of the borrow soil pits as between 0.5 m to 16 m, whereas as per the permission granted by the Mining Department, the depth of pits should not exceed 02 m. (Due to heavy rain, approach road to remaining mining sites was not accessible hence, visit of remaining sites could not be possible)

Copy of the above mention inspection report of CPCB is attached herewith for ready reference.

WHEREAS, Hon'ble NGT vide order dated 16.8.2024 has directed as below:

4. The applicant present in the person submits that illegal mining has been done and he has received certain documents under RTI. He is permitted to place the same on record. Meanwhile Member Secretary, CPCB is directed to ensure no further illegal mining takes place and, appropriate punitive action is taken after dully following the principle of natural justice in respect of illegal mining, if any, already done.

5. List on 28.11.2024.

WHEREAS, under section 16 of the Water Act,1974 and under Section 16 of the Air Act, 1981, one of the functions of the Central Pollution Control Board (CPCB), constituted under Water (Prevention & Control of Pollution) Act, L974 is to coordinate activities of the SPCBs and PCCs and to provide technical assistance and guidance to SPCBs/PCCs;

WHEREAS, the above facts reveal gross violations of provisions of environmental laws and MMDR Act, particularly, by not obtaining Consent for the expressway construction project, carrying out earth/soil mining in areas/sites not covered under the EIA study for the project, and carrying out mining more than the limit prescribed in the mining permissions given by the state mining department.

NOW, THEREFORE, in view of violation of provisions of environmental laws, as mentioned above, and the aforesaid order passed by Hon'ble NGT(PB), and in exercise of the powers conferred under Section 18(1) (b) of the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention & Control of Pollution) Act, 1981; the Uttar Pradesh Pollution Control Board (UPPCB) is hereby directed:

i. to get assessed the extent of illegal mining at all mining sites from which ordinary earth/soil has been mined for the said expressway construction work in Jalaun district;
ii. to initiate actions immediately for appropriate punitive action as applicable under the law, including levying and realisation of environmental compensation, for violation of provisions of environmental laws as mentioned in above paragraphs, after duly following the principle of natural justice;
iii. to take all necessary actions to ensure that no further illegal mining takes place, and;
iv. to get prepared a remediation plan by the project proponent for the illegal mining sites where illegal mining has taken place for the said expressway construction work in Jalaun district, in consultation with mining department and UPPCB, and get it implemented by the project proponent in a time bound manner.

The action taken report shall be sent by UPPCB to the CPCB within 10 days from the date of receipt of these directions.

(Bharat Kumar Sharma)
Member Secretary

Copy to:

1. The Secretary Department of Environment, Govt of UP, Bapu Bhawan, Secretariat, Vidhan Sabha Marg, Lucknow 226 001	: for information and necessary action, please.
2. Mr. Rajeev Ranjan Scientist 'E' & Member Secretary EAC - Non Coal Mining, Ministry Of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi -110003	: for information and necessary action, please.
3. The Director Geology & Mining, Government of UP Khanij Bhawan 27/8, Raja Ram Mohan Rai Marg, Lucknow-226001 (U.P.)	: for necessary action under the MMDR Act in respect of the above mentioned illegal mining, please.
4. The District Magistrate Jalaun Collectorate Campus Jalaun at Orai, PIN-285001, UP	

(Bharat Kumar Sharma)
Member Secretary

Annexure -2

Ph/Fax : 0510-2320473 (O)
E-mail : rojhansi@uppcb.in

क्षेत्रीय कार्यालय उ. प्र. प्रदूषण नियंत्रण बोर्ड
Regional Office, U.P. Pollution Control Board

संदर्भ सं0 .....
Ref. No. 531/OA-556/24 दिनांक 06.11.2024
Date.....20

सेवा में,

जिला खान अधिकारी
उरई, जनपद–जालौन।

विषय : **Direction under suection 18(1) of the water (Prevaention & Control of Pollution) Act, 1974 and the Air (Prevaention & Control of Pollution) Act, 1981 in matter related to O.A. No.-556 of 2023 (Arun Tiwari Versuss state of Uttar Pradesh & Ors.)**

महोदय,

कृपया उपरोक्त केन्द्रीय प्रदूषण नियंत्रण बोर्ड के पत्रांक CM-13011/110/2024-LAW-HO-CPCB-HO/5802 दिनांक 28.10.2024 द्वारा मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली ओ0ए0 संख्या–556/2023 अरूण तिवारी बनाम स्टेट ऑफ उत्तर प्रदेश व अन्य में पारित आदेश दिनांक 16.08.2024 के अनुपालन में Direction under suection 18(1) of the water (Prevaention & Control of Pollution) Act, 1974 and the Air (Prevaention & Control of Pollution) Act, 1981 जारी किये गये है। जो कि निम्नवत् है

i. to get assessed the extent of illegal mining at all mining sites from which ordinary earth/soil has been mined for the said expressway construction work in Jalaun district;
ii. to initiate actions immediately for appropriate punitive action as applicable under the law, including levying and realisation of environmental compensation, for violation of provisions of environmental laws as mentioned in above paragraphs, after duly following the principle of natural justice;
iii. to take all necessary actions to ensure that no further illegal mining takes place, and;
iv. to get prepared a remediation plan by the project proponent for the illegal mining sites where illegal mining has taken place for the said expressway construction work in Jalaun district, in consultation with mining department and UPPCB, and get it implemented by the project proponent in a time bound manner.

उक्त निर्देशो के अनुकम में जनपद–जालौन में उक्त बुन्देलखण्ड एक्सप्रेसवे, निमार्ण कार्य के लिए जिन स्थानों से साधारण मिट्टी का खनन किया गया है, उन सभी खनन स्थलो पर अवैध खनन की सीमा का आकंलन कर सूचना प्रेषित करने का कष्ट करें। जिससे की अवैध खनन के आकंलन के आधार पर पर्यावरणीय क्षतिपूर्ति अधिरोपित एवं दंडात्मक कार्यवाही की जा सकें। अतः आप से अनुरोध है कि उक्त के सम्बन्ध में सूचना शीघ्र प्रेषित करनें का कष्ट करें। जिससे की कृत कार्यवाही से केन्द्रीय प्रदूषण नियंत्रण बोर्ड एवं माननीय राष्ट्रीय हरित अधिकरण को समय से सूचना प्रेषित की जा सकें।

भवदीया
(दीपा अरोरा)
क्षेत्रीय अधिकारी

प्रतिलिपि : निम्नलिखित को सूचनार्थ एवं अग्रिम आवश्यक कार्यवाही हेतु सादर प्रेषित।

1. जिलाधिकारी महोदय, जनपद–जालौन को सादर अवगत कराना है कि जनपद जालौन में उक्त एक्सप्रेसवे निर्माण कार्य हेतु जिन अवैध खनन स्थलों पर अवैध खनन हुआ है, उनके लिए परियोजना प्रस्तावक द्वारा खनन विभाग एवं यूपीपीसीबी के परामर्श से सुधारात्मक योजना तैयार कराना तथा परियोजना प्रस्तावक द्वारा समयबद्ध ढंग से उसका क्रियान्वयन किया जाना है। अतः आप से अनुरोध है कि उक्त हेतु परियोजना प्रस्तावक को सुधारात्मक कार्य योजना प्रस्तुत करने हेतु अपने स्तर से निर्देशित करने का कष्ट करें।
2. मुख्य पर्यावरण अधिकारी (वृत्त–2), उ0प्र0 प्रदूषण नियंत्रण बोर्ड, लखनऊ।

6.11.24
क्षेत्रीय अधिकारी

Ph/Fax : 0510-2320473 (O)
E-mail : rojhansi@uppcb.in

क्षेत्रीय कार्यालय उ. प्र. प्रदूषण नियंत्रण बोर्ड
Regional Office, U.P. Pollution Control Board

पत्रांक/Letter No. 553/OA-556/NGT/24 दिनांक 14.11.2024
Ref. No. ..जिला..खान अधिकारी Date.....20
उरई, जनपद–जालौन।

विषय : **Compliance status of direction under suection 18(1) of the water (Prevaention & Control of Pollution) Act, 1974 and the Air (Prevaention & Control of Pollution) Act, 1981 in matter related to O.A. No.-556 of 2023 (Arun Tiwari Versuss state of Uttar Pradesh & Ors.)-Reg**

महोदय,

कृपया उपरोक्त केन्द्रीय प्रदूषण नियंत्रण बोर्ड के पत्रांक CM-13011/110/2024-LAW-HO-CPCB-HO/5802 दिनांक 28.10.2024 एवं पत्रांक CM-13011/110/2024-LAW-HO-CPCB-HO/5803 दिनांक 28.10.2024 द्वारा मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली ओ0ए0 संख्या–556/2023 अरूण तिवारी बनाम स्टेट ऑफ उत्तर प्रदेश व अन्य में पारित आदेश दिनांक 16.08.2024 के अनुपालन में Direction under suection 18(1) of the water (Prevaention & Control of Pollution) Act, 1974 and the Air (Prevaention & Control of Pollution) Act, 1981 जारी किये गये है। जो कि निम्नवत् है

i. to get assessed the extent of illegal mining at all mining sites from which ordinary earth/soil has been mined for the said expressway construction work in Jalaun district;
ii. to initiate actions immediately for appropriate punitive action as applicable under the law, including levying and realisation of environmental compensation, for violation of provisions of environmental laws as mentioned in above paragraphs, after duly following the principle of natural justice;
iii. **to take all necessary actions to ensure that no further illegal mining takes place, and;**
iv. to get prepared a remediation plan by the project proponent for the illegal mining sites where illegal mining has taken place for the said expressway construction work in Jalaun district, in consultation with mining department and UPPCB, and get it implemented by the project proponent in a time bound manner.

उक्त निर्देशो के अनुकम में यह सुनिश्चित किया जाये की भविष्य में प्रशनगत स्थल पर कोई भी अवैध खनन कार्य नही किया जाये। मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली ओ0ए0 संख्या–556/2023 अरूण तिवारी बनाम स्टेट ऑफ उत्तर प्रदेश व अन्य में पारित आदेश दिनांक 16.08.2024 का अनुपालन सुनिश्चित किया जायें तथा इस कार्यालय के पूर्व प्रेषित पत्रों द्वारा अवैध खनन से सम्बन्धित सूचना चाही गयी थी जो कि आज दिनांक 14.11.2024 तक प्राप्त नही है। उक्त सूचना को शीघ्र प्रेषित करने का कष्ट करें। जिससे कृत कार्यवाही से केन्द्रीय प्रदूषण नियंत्रण बोर्ड एवं माननीय राष्ट्रीय हरित अधिकरण को समय से सूचना प्रेषित की जा सकें।

भवदीया
(दीपा अरोरा)
क्षेत्रीय अधिकारी

प्रतिलिपि : निम्नलिखित को सूचनार्थ एवं अग्रिम आवश्यक कार्यवाही हेतु सादर प्रेषित।
1. सदस्य सचिव, उ0प्र0 प्रदूषण नियंत्रण बोर्ड, लखनऊ।
2. जिलाधिकारी महोदय, जनपद–जालौन को इस अनुरोध के साथ कि जनपद जालौन में उक्त एक्सप्रेसवे निर्माण कार्य हेतु जिन अवैध खनन स्थलों पर अवैध खनन हुआ है, उक्त खनन स्थलों पर भविष्य में अवैध खनन कार्य न हो उक्त हेतु सम्बन्धित सक्षम अधिकारी को निर्देशित करने का कष्ट करें।
3. मुख्य पर्यावरण अधिकारी (वृत्त–2), उ0प्र0 प्रदूषण नियंत्रण बोर्ड, लखनऊ।

14.11.24
क्षेत्रीय अधिकारी

उ. प्र. आवास विकास कालोनी, (तालपुरा योजना) कानपुर रोड, झाँसी– 284001
U. P. Avas Vikas Colony (Talpura Yojana) Kanpur Road, Jhansi (U.P.)

Annexure -3

प्रेषक,

20/11/24

खान अधिकारी,
जालौन ।

सेवा में,

क्षेत्रीय अधिकारी,
उ0प्र0 प्रदूषण नियंत्रण बोर्ड,
उ0प्र0 आवास विकास कालोनी(तालपुरा योजना)
कानपुर रोड झांसी ।

पत्रांक: 1904/ खनिज–एमएमसी–30 दिनांक: 16 नवम्बर, 2024

विषय – Direction under suection 18(1) of the water (Prevaention & Control of pollution)Act,1974 and the Air (Prevaention & Control of pollution) Act 1981 in matter related to O.A. No 556 of 2023 (Arun Tiwari Versuss state of Utter Pradesh & Ors)

महोदय,

कृपया उपर्युक्त विषयक आप अपने पत्र संख्या 581/ओ0ए0–556/24 दिनांक 05.11.2024 व पत्र सं0 553 दिनांक 14.11.2024 का संदर्भ ग्रहण करने का कष्ट करें, जिसके द्वारा प्रश्नगत प्रकरण के संबंध में जनपद जालौन में उक्त बुन्देलखण्ड एक्सप्रेसवे निर्माण कार्य के लिये जिन स्थानो से साधारण मिटटी का खनन किया गया था, उन सभी खनन स्थलो पर अवैध खनन की सीमा का आंकलन कर सूचना उपलब्ध कराये जाने की अपेक्षा की गयी है।

उक्त के अनुक्रम में अवगत कराना है कि प्रश्नगत प्रकरण बुन्देलखण्ड एक्सप्रेसवे निर्माण कार्य के लिये जिन स्थानो से साधारण मिटटी का खनन किया गया है, उक्त प्रकरण वर्ष 2020 से 2022 तक की समयावधि का है। कार्यालय अभिलेखो को अवलोकन करने से यह पाया गया कि कार्यालय जिलाधिकारी, जालौन के पत्र सं0 1782/खनिज–एमएमसी–30 दिनांक 26.12.2020 के अनुपालन में संयुक्त टीम द्वारा दिनांक 23.01.2021 को प्रश्नगत प्रकरण में जांच कर तत्कालीन जिलाधिकारी महोदय को आख्या पत्रांक 266/एस0टी0 एसडीएम दिनांक 25.01.2021 प्रेषित किया गया था जिस पर तत्कालीन जिलाधिकारी महोदय द्वारा उपजिलाधिकारी की जांच आख्या दिनांक 25.01.2021 के क्रम में 32 प्रकरणो मे नोटिस प्रोजेक्ट मैनेजर, गावर कान्स्ट्रक्शन कम्पनी लि0 पैकेज–4 बुन्देलखण्ड एक्सप्रेसवे बावली रोड कुठौन्द तहसील व जिला जालौन को निर्गत किये गये थे, पत्रावली में गावर कम्पनी द्वारा कोई स्पष्टीकरण उपलब्ध कराया जाना पत्रावली में नही पाया गया। तदक्रम में जिलाधिकारी महोदय के आदेश दिनांक 08.11.2024 के अनुपालन में कार्यालय पत्र सं0 1877/खनिज–एमएमसी–30 दिनांक 08.11.2024 द्वारा गावर कान्स्ट्रक्शन कम्पनी को अंतिम अवसर प्रदान करते हुये 15 दिवस के अन्दर स्पष्टीकरण प्रस्तुत करने हेतु निर्देशित किया गया है। यदि कम्पनी द्वारा निर्धारित अवधि में अपना स्पष्टीकरण प्रेषित नही किया जाता है तो नियमानुसार अग्रेतर कार्यवाही सुनिश्चित की जायेगी। वर्तमान समय में संबंधित प्रोजेक्ट समाप्त हो चुका है। वर्तमान में संबंधित क्षेत्र में साधारण मिटटी का कोई अवैध खनन का प्रकरण संज्ञानित नही है।

अतः प्रश्नगत प्रकरण मे उपलब्ध समस्त अभिलेख इस पत्र के साथ संलग्न कर आवश्यक कार्यवाही हेतु प्रेषित किया जा रहा है।

संलग्नक–उपरोक्तानुसार।

Sean Jacob 20-11-24

भवदीय

16/11/24

खान अधिकारी,
जालौन

Ph/Fax 0510-2320473 (O)
E-mail : rojhansi@uppcb.in

क्षेत्रीय कार्यालय उ. प्र. प्रदूषण नियंत्रण बोर्ड
Regional Office, U.P. Pollution Control Board

संदर्भ सं० ..... 561 /OA-556/NGT/24 दिनांक 10.11.2024
Ref. No. ..... Date 20

सेवा में,

मुख्य पर्यावरण अधिकारी (वृत्त–2),
उ0प्र0 प्रदूषण नियंत्रण बोर्ड,
लखनऊ।

विषय : मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली संख्या 556/2024 (अरूण तिवारी बनाम उत्तर प्रदेश) में आच्छादित परियोजना मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस.एफ.–1, जे.एम.डी. गलेरिया, सेक्टर–48, सोहना रोड, गुरूगॉव के विरूद्ध पर्यावणीय क्षतिपूर्ति अधिरोपित किये जाने के सम्बन्ध में।

महोदय,

कृपया उपरोक्त विषयक केन्द्रीय प्रदूषण नियंत्रण बोर्ड के पत्रांक CM-13011/|10/2024-LAW- HO-CPCB-HO/5802 दिनांक 28.10.2020 का संदर्भ ग्रहण करने की कृपा करें। उक्त पत्र के माध्यम से केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा बिन्दु संख्या 02 के अन्तर्गत जारी निर्देश के मुख्यअंश निम्नवत् है–

ii. to initiate actions immediately for appropriate punitive action as applicable under the law, including levying and realisation of environmental compensation, for violation of provisions of environmental laws as mentioned in above paragraphs, after duly following the principle of natural justice;

उक्त निर्देशो के अनुपालन हेतु बुन्देलखण्ड एक्सप्रेस वे निर्माण हेतु किये गये अवैध मिट्टी खनन के आलोक में मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस.एफ.–1, जे.एम.डी. गलेरिया, सेक्टर–48, सोहना रोड, गुरूगॉव के विरूद्ध अभियोजनात्मक कार्यवाही किये जाने की संस्तुति इस कार्यालय के पत्र संख्या 555/ओ0ए0–556/2023/2024–25 दिनांक 14.11.2024 के माध्यम से बोर्ड मुख्यालय प्रेषित की गयी है। अग्रेतर खान अधिकारी, जनपद–जालौन के पत्रांक 1904/एम.एम.सी.–30 दिनांक 16.11.2024 में उल्लेखित है कि प्रश्नगत प्रकरण बुन्देखण्ड एक्सप्रेस वे निर्माण कार्य के लिये जिन स्थानो से मिट्टी का खनन कार्य किया गया है, उक्त प्रकरण वर्ष 2020 से 2022 तक समयावधि का है। तत्सम्बन्धी पत्र दिनांकित 16.11.2024 की प्रति संलग्न है। कार्यालय अभिलेखानुसार बुन्देलखण्ड एक्सप्रेस वे निर्माण हेतु यू.पी.ई.आई.डी.ए. एवं मैसर्स गावर कन्सट्रक्शन लिमिटेड,एस.एफ.–1, जे.एम.डी. गलेरिया, सेक्टर–48, सोहना रोड, गुरूगॉव के मध्य दिनांक 15.01.2020 को अनुबंध किया गया है, पत्र की छायाप्रति संलग्न है। इस प्रकार उक्त वर्णित पत्र दिनांक 16.11.2024 एवं अनुबंध पत्र दिनांक 15.01.2020 के माध्यम से मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस.एफ.–1, जे.एम.डी. गलेरिया, सेक्टर–48, सोहना रोड, गुरूगॉव द्वारा बुन्देलखण्ड एक्सप्रेस वे निर्माण हेतु दिनांक 15.01.2020 से दिनांक 31.12.2022 की अवधि के मध्य अवैध मिट्टी खनन किये जाने का तथ्य प्रकाश में आया है। अवैध मिट्टी खनन किये जाने के फलस्वरूप पर्यावरणीय क्षति होना सम्भावित है। उक्त के आलोक में अवैध मिट्टी खनन किये जाने के फलस्वरूप मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस.एफ.–1, जे.एम.डी. गलेरिया, सेक्टर–48, सोहना रोड, गुरूगॉव पर दिनांक 15.01.2020 से दिनांक 31.12.2022 तक की अवधि अर्थात् 1066 दिनों की डिफाल्टर अवधि हेतु रू 10,000.00 प्रतिदिन की दर से पर्यावरण क्षतिपूर्ति अधिरोपित किया जाना उचित प्रतीत होता है।

अतः उपरोक्त के परिप्रेक्षय में मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस.एफ.–1, जे.एम.डी. गलेरिया, सेक्टर–48, सोहना रोड, गुरूगॉव के विरूद्ध उक्त वर्णित कुल 1066 दिनों की डिफाल्टर अवधि हेतु गणनानुसार कुल रू 1,06,60,000.00 (कुल एक करोड छः लाख साठ हजार मात्र) धनराशि की पर्यावरण क्षतिपूर्ति अधिरोपित किये जाने की संस्तुति की जाती है।

संलग्नक : यथोपरि।

भवदीया

10.11.24

(दीपा अरोरा)
क्षेत्रीय अधिकारी

Annexure -4

U.P. Expressways Industrial Development Authority
Setup by GoUP Under UP Industrial Area Development ACt 1976

UTTAR PRADESH EXPRESSWAYS INDUSTRIAL DEVELOPMENT AUTHORITY
(UPEIDA)

Government of Uttar Pradesh

Development of Bundelkhand Expressway
(Package-IV)
From BaroliKharka (Dist. Hamirpur) to Saalabad (Dist. Jalaun)
(Km 149+000 to Km 200+000)
in the State of Uttar Pradesh on EPC Basis

VOLUME-II: SCHEDULES TO EPC AGREEMENT

Between

Uttar Pradesh Expressways Industrial Development Authority
(UPEIDA)
2nd Floor, Paryatan Bhawan,
C-13, Vipin Khand, Gomti Nagar,
Lucknow – 226010

&

Gawar Construction Ltd.
SF-01, JMD GALLERIA,
SECTOR - 48, SOHNA ROAD,
GURGAON - 122001 (HARYANA)

UPEIDA LUCKNOW

Gawar Const. Ltd. DSS-378, Sec.16-17

SCHEDULE-A

(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1. The Site

1.1. Site of the Project Expressway shall include the land buildings, structures and road works as described in Annex-I of this Schedule-A.

1.2. The dates of handing over the Right of Way (ROW) to the Contractor are specified in Annex-II of this Schedule-A.

1.3. An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in clause 8.2.1 of the Agreement.

1.4. The alignment plans of the Project Expressway are specified in Annex-III.

1.5. The status of the environment clearances obtained or awaited is given in Annex-IV.

Annex –I
(Schedule-A)

SITE

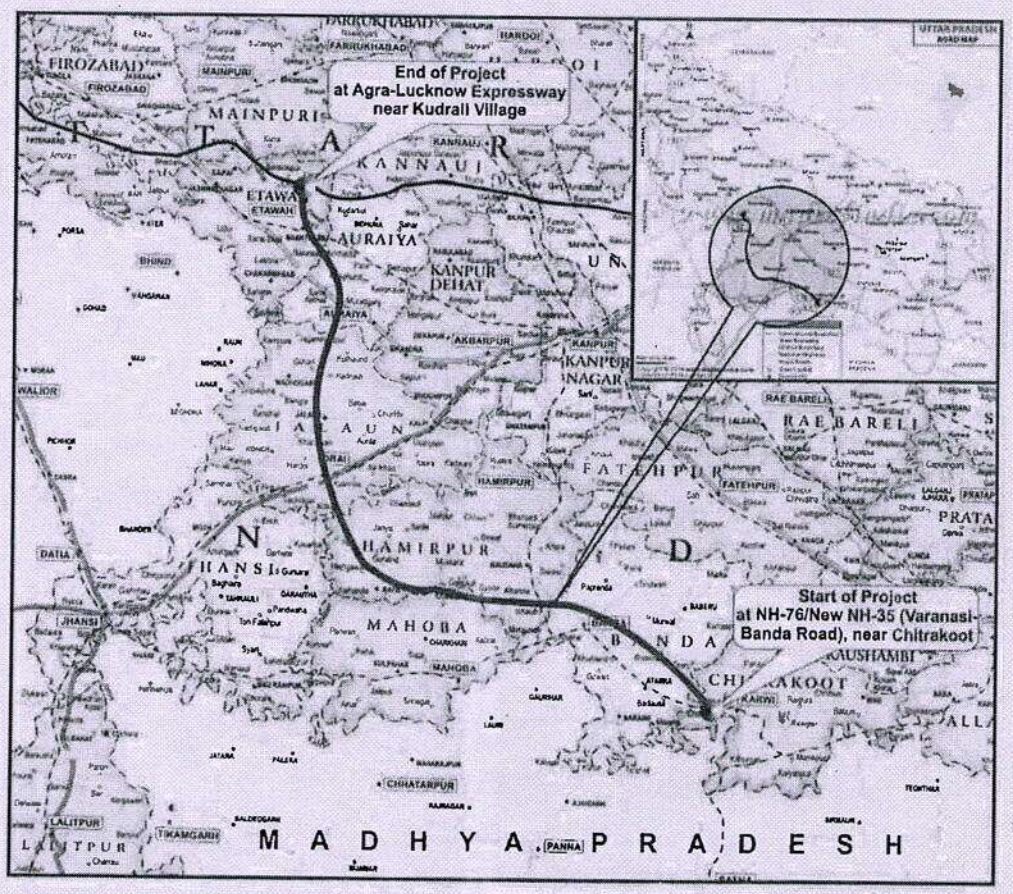
Note: Through suitable drawings and description in words the land, building, structures and road work comprising the site shall be specified briefly but precisely in this Annex-I. All the chainages / location referred to in Annex-I to schedule-A shall be proposed design chainages.

1. Site

The Project Expressway Section is starting from BaroliKharka (Dist. Hamirpur) to Saalabad (Dist. Jalaun) from Km 149+000 to Km 200+000 (design chainage) and is fully access controlled 4-lane (expandable to 6 lanes) divided carriageway in the state of Uttar Pradesh (hereinafter referred to as "Project Expressway") and all project assets, and its development in accordance with this Agreement.

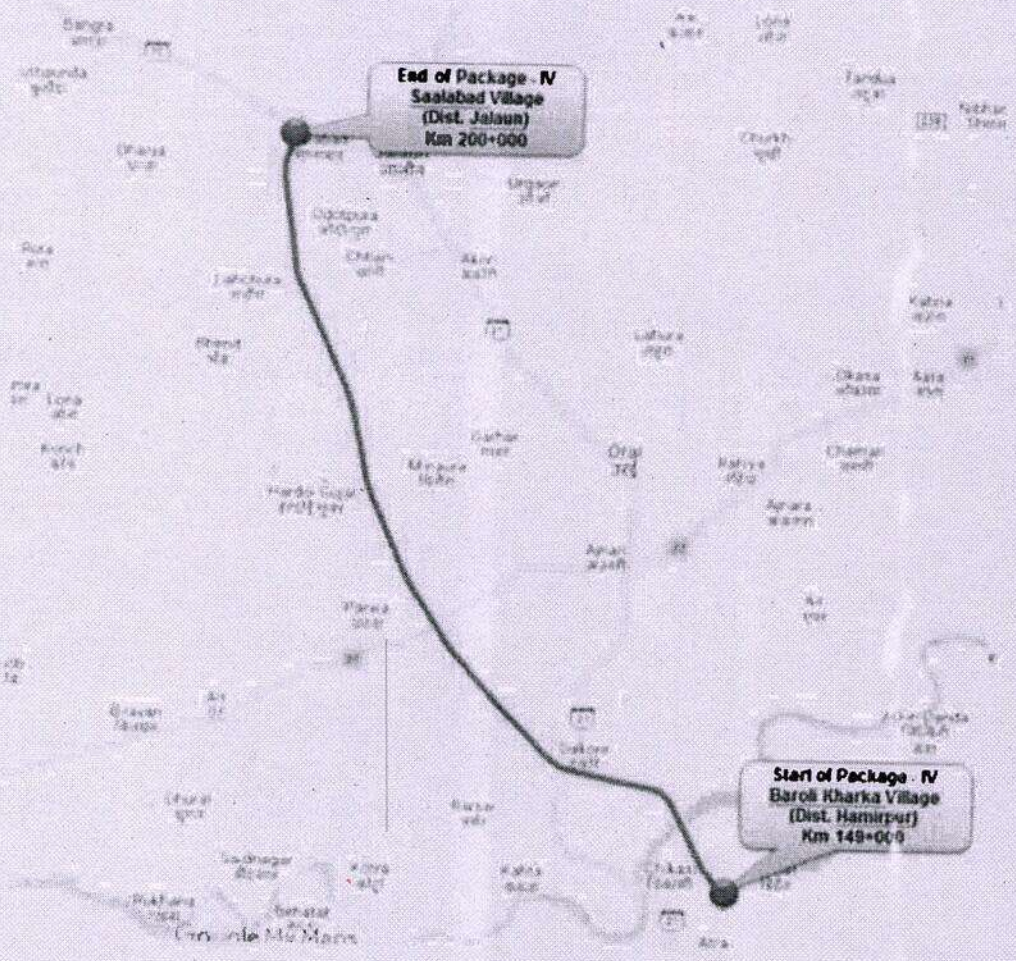
The alignment starts from village BaroliKharka Km 149+000 (design chainage) in Hamirpur district crosses SH-21 at Km 164+330 near village Dakore; NH-27 at Km 174+640 near village Bhua and ends at Km 200+000 in village Saalabad(Jalaun district).

Location map / key plan of Bundelkhand Expressway and Package-IV are given below:



Location Map: Bundelkhand Expressway

135



Location Map: Package - IV

2. Land

The Site of the Project Expressway comprises the land (sum total of land already in possession and land to be possessed) as described below:

S. No.	Chainage (Km)		ROW (m)*	Area of Land (In Hectares)	Remarks
	From	To			
1	149+000	200+000	110	625.7189	To be Possessed

Note: *- The ROW has been taken as 110m for the proposed expressway except at Interchange locations, Toll Plaza locations and Way Side Amenities Areas (wherever applicable), where the ROW varies.

Referencing System

Project Expressway is entirely a Greenfield alignment starting at Village Baroli Kharka (Km 149+000) in District Hamirpur and ending at Village Saalabad (Km 200+000) in District Jalaun. The design Chainage co-ordinates (GPS co-ordinates at center of ROW) at every 100 m distance are given below:

Main Expressway

Chainage	Easting	Northing
149+000	352472.555	2851957.159
149+100	352421.351	2852043.055
149+200	352370.147	2852128.952
149+300	352318.943	2852214.848
149+400	352267.739	2852300.744
149+500	352216.535	2852386.640
149+600	352165.332	2852472.537
149+700	352114.128	2852558.433
149+800	352062.924	2852644.329
149+900	352011.720	2852730.225
150+000	351960.516	2852816.122
150+100	351909.312	2852902.018
150+200	351858.109	2852987.914
150+300	351806.905	2853073.810
150+400	351755.701	2853159.707
150+500	351704.497	2853245.603
150+600	351653.293	2853331.499
150+700	351602.089	2853417.395
150+800	351550.886	2853503.292
150+900	351499.682	2853589.188
151+000	351448.478	2853675.084
151+100	351397.274	2853760.980
151+200	351346.070	2853846.877
151+300	351294.785	2853932.724
151+400	351241.959	2854017.628
151+500	351186.374	2854100.751
151+600	351128.050	2854181.975
151+700	351067.051	2854261.210
151+800	351003.446	2854338.368
151+900	350937.304	2854413.364
152+000	350868.700	2854486.114
152+100	350798.009	2854556.842
152+200	350726.819	2854627.070
152+300	350655.630	2854697.299
152+400	350584.440	2854767.527
152+500	350513.250	2854837.756
152+600	350442.061	2854907.984
152+700	350370.871	2854978.213
152+800	350299.681	2855048.441
152+900	350228.492	2855118.669
153+000	350157.302	2855188.898
153+100	350086.112	2855259.126
153+200	350014.939	2855329.371
153+300	349944.393	2855400.245
153+400	349874.798	2855472.053
153+500	349806.167	2855544.783
153+600	349738.512	2855618.422
153+700	349671.845	2855692.956
153+800	349606.177	2855768.378

Chainage	Easting	Northing
153+900	349541.521	2855844.657
154+000	349477.887	2855921.797
154+100	349415.288	2855999.779
154+200	349353.734	2856078.589
154+300	349293.236	2856158.212
154+400	349233.805	2856238.635
154+500	349175.452	2856319.843
154+600	349118.187	2856401.822
154+700	349062.019	2856484.557
154+800	349006.960	2856568.034
154+900	348953.019	2856652.237
155+000	348900.205	2856737.152
155+100	348848.528	2856822.763
155+200	348797.997	2856909.056
155+300	348748.622	2856996.016
155+400	348700.410	2857083.625
155+500	348653.370	2857171.870
155+600	348607.511	2857260.734
155+700	348562.841	2857350.201
155+800	348519.190	2857440.171
155+900	348475.664	2857530.202
156+000	348432.137	2857620.232
156+100	348388.611	2857710.262
156+200	348345.085	2857800.292
156+300	348301.558	2857890.323
156+400	348258.032	2857980.353
156+500	348214.506	2858070.383
156+600	348170.980	2858160.414
156+700	348127.453	2858250.444
156+800	348083.927	2858340.474
156+900	348040.401	2858430.505
157+000	347996.874	2858520.535
157+100	347953.348	2858610.565
157+200	347909.822	2858700.596
157+300	347866.295	2858790.626
157+400	347822.769	2858880.656
157+500	347779.243	2858970.687
157+600	347735.716	2859060.717
157+700	347692.190	2859150.747
157+800	347648.664	2859240.778
157+900	347605.137	2859330.808
158+000	347561.611	2859420.838
158+100	347518.085	2859510.869
158+200	347474.558	2859600.899
158+300	347431.032	2859690.929
158+400	347387.506	2859780.960
158+500	347343.979	2859870.990
158+600	347300.453	2859961.020
158+700	347256.927	2860051.051
158+800	347212.798	2860140.784

Chainage	Easting	Northing
158+900	347164.275	2860228.202
159+000	347110.040	2860312.195
159+100	347050.330	2860392.389
159+200	346985.410	2860468.426
159+300	346915.569	2860539.970
159+400	346841.117	2860606.703
159+500	346762.385	2860668.327
159+600	346679.723	2860724.570
159+700	346593.498	2860775.181
159+800	346504.092	2860819.935
159+900	346411.904	2860858.634
160+000	346317.342	2860891.106
160+100	346220.836	2860917.242
160+200	346123.298	2860939.289
160+300	346025.682	2860960.997
160+400	345928.067	2860982.704
160+500	345830.452	2861004.412
160+600	345732.836	2861026.120
160+700	345635.221	2861047.827
160+800	345537.605	2861069.535
160+900	345439.990	2861091.243
161+000	345342.374	2861112.950
161+100	345244.759	2861134.658
161+200	345147.143	2861156.366
161+300	345049.528	2861178.073
161+400	344951.913	2861199.781
161+500	344854.297	2861221.489
161+600	344756.682	2861243.197
161+700	344659.066	2861264.904
161+800	344561.451	2861286.612
161+900	344463.835	2861308.320
162+000	344366.220	2861330.027
162+100	344268.604	2861351.735
162+200	344170.989	2861373.443
162+300	344073.373	2861395.150
162+400	343975.758	2861416.858
162+500	343878.143	2861438.566
162+600	343780.527	2861460.273
162+700	343682.912	2861481.981
162+800	343585.296	2861503.689
162+900	343487.681	2861525.397
163+000	343390.065	2861547.104
163+100	343292.450	2861568.812
163+200	343194.834	2861590.520
163+300	343097.219	2861612.227
163+400	342999.603	2861633.935
163+500	342901.988	2861655.643
163+600	342804.373	2861677.350
163+700	342706.757	2861699.058
163+800	342609.142	2861720.766

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Gawar Const. Ltd. HISAR DSS-378, Sec.16-17

Chainage	Easting	Northing
163+900	342511.526	2861742.473
164+000	342413.911	2861764.181
164+100	342316.295	2861785.889
164+200	342218.680	2861807.596
164+300	342121.108	2861829.498
164+400	342024.041	2861853.521
164+500	341927.825	2861880.752
164+600	341832.570	2861911.175
164+700	341738.382	2861944.756
164+800	341645.365	2861981.457
164+900	341553.623	2862021.238
165+000	341463.258	2862064.054
165+100	341374.370	2862109.857
165+200	341287.058	2862158.598
165+300	341201.419	2862210.222
165+400	341117.547	2862264.671
165+500	341035.537	2862321.885
165+600	340955.480	2862381.800
165+700	340877.463	2862444.350
165+800	340801.575	2862509.465
165+900	340727.899	2862577.074
166+000	340656.517	2862647.100
166+100	340587.091	2862719.072
166+200	340518.053	2862791.416
166+300	340449.015	2862863.760
166+400	340379.976	2862936.105
166+500	340310.938	2863008.449
166+600	340241.900	2863080.794
166+700	340172.861	2863153.138
166+800	340103.823	2863225.482
166+900	340034.785	2863297.827
167+000	339965.747	2863370.171
167+100	339896.708	2863442.516
167+200	339827.670	2863514.860
167+300	339758.632	2863587.204
167+400	339689.593	2863659.549
167+500	339620.555	2863731.893
167+600	339551.517	2863804.238
167+700	339482.478	2863876.582
167+800	339413.440	2863948.926
167+900	339344.402	2864021.271
168+000	339275.363	2864093.615
168+100	339206.325	2864165.960
168+200	339137.287	2864238.304
168+300	339068.249	2864310.648
168+400	338999.210	2864382.993
168+500	338930.172	2864455.337
168+600	338861.249	2864527.791
168+700	338792.681	2864600.581
168+800	338724.478	2864673.714

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Gawar Const. Ltd. HISAR DSS-370, Sec.16-17

Chainage	Easting	Northing
168+900	338656.641	2864747.186
169+000	338589.173	2864820.997
169+100	338522.075	2864895.144
169+200	338455.155	2864969.452
169+300	338388.235	2865043.761
169+400	338321.316	2865118.069
169+500	338254.396	2865192.378
169+600	338187.476	2865266.686
169+700	338120.556	2865340.995
169+800	338053.637	2865415.303
169+900	337986.717	2865489.611
170+000	337919.797	2865563.920
170+100	337852.877	2865638.228
170+200	337785.958	2865712.537
170+300	337719.038	2865786.845
170+400	337652.118	2865861.154
170+500	337585.198	2865935.462
170+600	337518.279	2866009.771
170+700	337451.359	2866084.079
170+800	337384.439	2866158.388
170+900	337317.519	2866232.696
171+000	337250.600	2866307.005
171+100	337183.680	2866381.313
171+200	337116.760	2866455.621
171+300	337049.840	2866529.930
171+400	336982.920	2866604.238
171+500	336916.001	2866678.547
171+600	336849.081	2866752.855
171+700	336782.161	2866827.164
171+800	336715.241	2866901.472
171+900	336648.322	2866975.781
172+000	336581.402	2867050.089
172+100	336514.482	2867124.398
172+200	336447.562	2867198.706
172+300	336380.643	2867273.014
172+400	336313.724	2867347.324
172+500	336247.215	2867421.999
172+600	336181.456	2867497.336
172+700	336116.453	2867573.327
172+800	336052.214	2867649.964
172+900	335988.745	2867727.240
173+000	335926.051	2867805.146
173+100	335864.139	2867883.676
173+200	335803.016	2867962.821
173+300	335742.687	2868042.572
173+400	335683.159	2868122.924
173+500	335624.438	2868203.866
173+600	335566.528	2868285.392
173+700	335509.437	2868367.492
173+800	335453.170	2868450.160

Gawar Const. Ltd. HISAR DSS-378, Sec.16-17

Chainage	Easting	Northing
173+900	335397.732	2868533.386
174+000	335343.129	2868617.162
174+100	335289.366	2868701.480
174+200	335236.006	2868786.053
174+300	335182.645	2868870.626
174+400	335129.285	2868955.200
174+500	335075.924	2869039.773
174+600	335022.563	2869124.346
174+700	334969.203	2869208.920
174+800	334915.842	2869293.493
174+900	334862.482	2869378.066
175+000	334809.121	2869462.640
175+100	334755.761	2869547.213
175+200	334702.400	2869631.786
175+300	334649.039	2869716.360
175+400	334595.679	2869800.933
175+500	334542.318	2869885.506
175+600	334488.958	2869970.080
175+700	334435.597	2870054.653
175+800	334382.237	2870139.226
175+900	334328.876	2870223.800
176+000	334275.516	2870308.373
176+100	334222.155	2870392.946
176+200	334168.794	2870477.520
176+300	334115.434	2870562.093
176+400	334062.073	2870646.666
176+500	334008.713	2870731.240
176+600	333955.352	2870815.813
176+700	333901.992	2870900.386
176+800	333848.631	2870984.960
176+900	333795.270	2871069.533
177+000	333741.910	2871154.107
177+100	333688.627	2871238.729
177+200	333636.758	2871324.222
177+300	333586.800	2871410.847
177+400	333538.780	2871498.560
177+500	333492.720	2871587.319
177+600	333448.645	2871677.079
177+700	333406.574	2871767.797
177+800	333366.165	2871859.268
177+900	333325.920	2871950.812
178+000	333285.675	2872042.357
178+100	333245.429	2872133.901
178+200	333205.184	2872225.445
178+300	333164.939	2872316.989
178+400	333124.694	2872408.533
178+500	333084.449	2872500.077
178+600	333044.203	2872591.621
178+700	333003.958	2872683.165
178+800	332963.713	2872774.709

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Chainage	Easting	Northing
178+900	332923.468	2872866.254
179+000	332883.222	2872957.798
179+100	332842.977	2873049.342
179+200	332802.732	2873140.886
179+300	332762.487	2873232.430
179+400	332722.242	2873323.974
179+500	332681.996	2873415.518
179+600	332641.751	2873507.062
179+700	332601.506	2873598.606
179+800	332561.261	2873690.150
179+900	332521.016	2873781.695
180+000	332480.770	2873873.239
180+100	332440.525	2873964.783
180+200	332400.280	2874056.327
180+300	332360.035	2874147.871
180+400	332319.790	2874239.415
180+500	332279.544	2874330.959
180+600	332239.299	2874422.503
180+700	332199.054	2874514.047
180+800	332158.809	2874605.591
180+900	332118.563	2874697.136
181+000	332078.318	2874788.680
181+100	332038.073	2874880.224
181+200	331997.828	2874971.768
181+300	331957.583	2875063.312
181+400	331917.337	2875154.856
181+500	331877.092	2875246.400
181+600	331836.847	2875337.944
181+700	331796.602	2875429.488
181+800	331756.357	2875521.033
181+900	331716.111	2875612.577
182+000	331675.866	2875704.121
182+100	331635.621	2875795.665
182+200	331595.376	2875887.209
182+300	331555.808	2875979.046
182+400	331518.067	2876071.649
182+500	331482.186	2876164.988
182+600	331448.178	2876259.026
182+700	331416.057	2876353.725
182+800	331385.837	2876449.048
182+900	331357.530	2876544.956
183+000	331331.146	2876641.411
183+100	331306.696	2876738.374
183+200	331284.190	2876835.807
183+300	331263.637	2876933.671
183+400	331244.028	2877031.729
183+500	331224.419	2877129.788
183+600	331204.810	2877227.846
183+700	331185.200	2877325.905
183+800	331165.591	2877423.963

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Chainage	Easting	Northing
183+900	331145.982	2877522.022
184+000	331126.373	2877620.080
184+100	331106.763	2877718.139
184+200	331087.154	2877816.197
184+300	331067.545	2877914.256
184+400	331047.936	2878012.315
184+500	331028.327	2878110.373
184+600	331008.717	2878208.432
184+700	330989.108	2878306.490
184+800	330969.499	2878404.549
184+900	330949.890	2878502.607
185+000	330930.281	2878600.666
185+100	330910.671	2878698.724
185+200	330891.062	2878796.783
185+300	330871.453	2878894.841
185+400	330851.844	2878992.900
185+500	330832.235	2879090.959
185+600	330812.625	2879189.017
185+700	330793.016	2879287.076
185+800	330773.407	2879385.134
185+900	330753.798	2879483.193
186+000	330734.188	2879581.251
186+100	330714.579	2879679.310
186+200	330694.970	2879777.368
186+300	330675.361	2879875.427
186+400	330655.752	2879973.486
186+500	330636.142	2880071.544
186+600	330616.203	2880169.535
186+700	330594.478	2880267.145
186+800	330570.807	2880364.301
186+900	330545.197	2880460.965
187+000	330517.658	2880557.096
187+100	330488.203	2880652.658
187+200	330456.843	2880747.612
187+300	330423.590	2880841.919
187+400	330388.458	2880935.543
187+500	330351.460	2881028.445
187+600	330312.612	2881120.589
187+700	330272.578	2881212.226
187+800	330232.521	2881303.852
187+900	330192.464	2881395.479
188+000	330152.407	2881487.106
188+100	330112.351	2881578.733
188+200	330072.294	2881670.359
188+300	330032.237	2881761.986
188+400	329992.180	2881853.613
188+500	329952.124	2881945.240
188+600	329912.067	2882036.866
188+700	329872.010	2882128.493
188+800	329831.953	2882220.120

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Chainage	Easting	Northing
188+900	329791.897	2882311.746
189+000	329751.840	2882403.373
189+100	329711.783	2882495.000
189+200	329671.726	2882586.627
189+300	329631.669	2882678.253
189+400	329591.613	2882769.880
189+500	329551.556	2882861.507
189+600	329511.499	2882953.133
189+700	329471.442	2883044.760
189+800	329431.386	2883136.387
189+900	329391.329	2883228.014
190+000	329351.272	2883319.640
190+100	329311.215	2883411.267
190+200	329271.159	2883502.894
190+300	329231.102	2883594.520
190+400	329191.045	2883686.147
190+500	329150.988	2883777.774
190+600	329110.932	2883869.401
190+700	329070.875	2883961.027
190+800	329030.818	2884052.654
190+900	328990.761	2884144.281
191+000	328950.705	2884235.908
191+100	328910.648	2884327.534
191+200	328870.591	2884419.161
191+300	328830.534	2884510.788
191+400	328790.477	2884602.414
191+500	328750.421	2884694.041
191+600	328710.364	2884785.668
191+700	328670.307	2884877.295
191+800	328630.250	2884968.921
191+900	328590.194	2885060.548
192+000	328550.137	2885152.175
192+100	328510.080	2885243.801
192+200	328470.023	2885335.428
192+300	328429.967	2885427.055
192+400	328389.910	2885518.682
192+500	328349.853	2885610.308
192+600	328309.796	2885701.935
192+700	328269.740	2885793.562
192+800	328229.683	2885885.188
192+900	328189.626	2885976.815
193+000	328149.569	2886068.442
193+100	328109.513	2886160.069
193+200	328069.456	2886251.695
193+300	328029.399	2886343.322
193+400	327989.342	2886434.949
193+500	327949.285	2886526.576
193+600	327909.232	2886618.204
193+700	327870.008	2886710.188
193+800	327833.588	2886803.315

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Gawar Const. Ltd. HISAR DSS-378, Sec. 16-17

Chainage	Easting	Northing
193+900	327800.292	2886897.604
194+000	327770.157	2886992.950
194+100	327743.216	2887089.248
194+200	327719.500	2887186.390
194+300	327699.034	2887284.269
194+400	327681.841	2887382.775
194+500	327667.905	2887481.795
194+600	327655.859	2887581.067
194+700	327643.931	2887680.353
194+800	327632.002	2887779.639
194+900	327620.074	2887878.925
195+000	327608.145	2887978.211
195+100	327596.217	2888077.497
195+200	327584.288	2888176.783
195+300	327572.360	2888276.069
195+400	327560.431	2888375.355
195+500	327548.503	2888474.641
195+600	327536.575	2888573.927
195+700	327524.646	2888673.213
195+800	327512.718	2888772.499
195+900	327500.789	2888871.785
196+000	327488.861	2888971.071
196+100	327476.932	2889070.357
196+200	327465.004	2889169.643
196+300	327453.075	2889268.929
196+400	327441.147	2889368.215
196+500	327429.218	2889467.501
196+600	327417.290	2889566.787
196+700	327405.361	2889666.073
196+800	327393.433	2889765.359
196+900	327381.505	2889864.645
197+000	327369.576	2889963.931
197+100	327357.648	2890063.217
197+200	327345.719	2890162.503
197+300	327333.791	2890261.789
197+400	327321.862	2890361.075
197+500	327309.934	2890460.361
197+600	327298.005	2890559.647
197+700	327286.077	2890658.933
197+800	327274.148	2890758.219
197+900	327262.220	2890857.505
198+000	327250.291	2890956.791
198+100	327238.363	2891056.077
198+200	327226.435	2891155.363
198+300	327214.506	2891254.649
198+400	327202.578	2891353.935
198+500	327190.649	2891453.221
198+600	327178.721	2891552.507
198+700	327166.792	2891651.793
198+800	327154.864	2891751.079

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Chainage	Easting	Northing
198+900	327142.935	2891850.365
199+000	327131.007	2891949.651
199+100	327119.078	2892048.937
199+200	327107.516	2892148.266
199+300	327099.391	2892247.925
199+400	327096.245	2892347.865
199+500	327098.099	2892447.837
199+600	327104.946	2892547.592
199+700	327116.771	2892646.880
199+800	327133.543	2892745.453
199+900	327155.221	2892843.064
200+000	327181.750	2892939.470

3. **Carriageway**

This Project envisages construction of a fully access controlled Expressway with 4-lane (expandable to 6 lanes) divided carriageway. There are existing roads crossing the alignment of Expressway at the locations of Interchanges, Flyovers, Underpasses etc. as given in Schedule-B.

4. **Major Bridges**

Sr. No.	Proposed Chainage (Km)	Span Arrangement	Remarks
Nil			

5. **Railway Over Bridges**

Sr. No.	Proposed Chainage (Km)	Span Arrangement	Remarks
Nil			

6. **Grade Separator**

Sr. No.	Proposed Chainage (Km)	Span Arrangement	Remarks
Nil			

7. **Minor Bridges**

Sr. No.	Proposed Chainage (Km)	Span Arrangement	Remarks
Nil			

8. **Railway Level Crossings**

Sr. No.	Location (Km)	Remarks
Nil		

9. **Underpasses (Vehicular, Non Vehicular)**

Sr. No.	Proposed Chainage (Km)	Span Arrangement	Remarks
Nil			

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10. Culverts

Sr. No.	Proposed Chainage (Km)	Span Arrangement	Remarks
Nil			

11. Bus bays

S. No.	Chainage (km)	Length (m)	Left Hand Side	Right Hand Side
Nil				

12. Truck Lay byes

S. No.	Chainage (km)	Length (m)	Left Hand Side	Right Hand Side
Nil				

13. Road side drains

S. No.	Location (km)		Type	
	From	To	Masonry/CC (Pucca)	Earthen (Kutcha)
Nil				

14. Major Junctions

S. No.	Location		At grade	Separated	Category of Cross Road			
	From km	to km			NH	SH	MDR	Others
Nil								

(NH: National Highway, SH: State Highway, MDR: Major District Road)

15. Minor Junctions

S. No.	Location (km)		Type	
	From Km	To Km	T- Junction	Cross Roads
Nil				

16. Bypasses

S. No.	Name of Bypass (town)	Chainage (km)		Length	Carriageway	
		From Km	To Km	(km)	Width (m)	Type
Nil						

Annex -II

(Schedule-A)

DATES FOR PROVIDING RIGHT OF WAY

The dates on which the Authority shall provide Right of Way to the Contractor on different stretches of the Site are stated below:

Sl. No.	From (km)	To (km)	Length (Km)	Width (m)	Date of providing ROW
1	2	3	4	5	6
(i) 90% length of Full Right of Way (full width)	TBD	TBD	TBD	110 m	**Before Appointed Date**
(ii) Balance length of Full Right of Way (full width)	TBD	TBD	TBD	110 m	**Within 90 days of Appointed Date**

* TBD: To be decided

Annex - III

(Schedule-A)

ALIGNMENT PLANS

The alignment plan of the project expressway is enclosed in Volume IV: Plan & Profile.

Annex - IV

(Schedule-A)

ENVIRONMENT CLEARANCES

The status of Environment and Forest Clearances is as under:

Environment Clearances:

Project attracts environmental clearance and has to be obtained from State Level Environmental Impact Assessment Authority (SEIAA). Application for obtaining clearances is in progress.

Forest Clearance:

Project is impacting forests. Application for obtaining clearances is in progress.

SCHEDULE-B

(See Clauses 2.1)

DEVELOPMENT OF THE PROJECT EXPRESSWAY

1. **Development of the Project Expressway.**

Development of the Project Expressway shall include construction of the Project Expressway as described in this Schedule-B and in Schedule-C.

2. **Construction of Project Expressway**

Project Expressway shall include construction of fully access controlled 4-lane (expandable to 6 lanes) divided carriageway as described in Annex-I of this Schedule-B and Schedule-C.

3. **Project Facilities**

Project facilities shall be constructed in conformity with Annex-I of Schedule-C.

4. **Specifications and Standards**

Project Expressway shall be designed and constructed in conformity with the Specifications and Standards specified in Schedule-D.

Annex -I
(Schedule-B)

DESCRIPTION OF PROJECT EXPRESSWAY

1. Project Proposal

1.1. The 4-lane (expandable to 6 lanes) divided carriageway Project Expressway starts from Village BaroliKharka (Dist. Hamirpur) Km 149+000 to Village Saalabad (Dist. Jalaun) Km 200+000 in the state of Uttar Pradesh, as shown in the alignment plans.

1.2. Width of Carriageway / Shoulders / Edge Strip

1.2.1. 4-lane (expandable to 6 lanes) divided carriageway of overall formation width of 30.50m including 5.5m raised median (median includes 0.75m of edge strip on either side) throughout. The paved width shall be 11.250m (2-lane width of 7.50 m + 3.0m paved shoulder + 0.75 m edge strip) on both side of the median. Earthen shoulder of 2.0m width shall be provided beyond paved shoulders on either side. Typical cross-sections are attached to Annex-II of Schedule-B.

2. Geometric Design and General Features

Refer to Schedule-D

2.1. Design Speed

The design speed shall be the minimum design speed of 120 km/hr.

2.2. Improvement of the Existing Road Geometrics

Proposed Expressway is a Greenfield project.

2.3. Right of Way

Details of the Right of Way are given as under:

Description	Total Required ROW*	Available ROW	ROW to be Acquired
Main Expressway	110 m	Nil	Full Area of length

Note: *-The ROW has been taken as 110m for the proposed expressway except at Interchange locations, Toll Plaza locations and Way Side Amenities Areas (wherever applicable), where the ROW varies.

2.4. Type of Shoulders / Edge strip

a) As per enclosed Typical Cross Section at Annex-II of Schedule-B.
b) In open country i.e. along the Project Expressway paved shoulders of 3.0 m and earthen shoulder of 2.0 m width shall be provided as per enclosed Typical Cross Section at Annex-II of Schedule-B.
c) A paved edge strip of 0.75m shall be provided as per enclosed Typical Cross Section at Annex-II of Schedule-B.

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2.5. Lateral and Vertical Clearances at Underpasses

Refer to Schedule-D.

2.6. Service Roads

2.6.1. 3.75m wide carriageway service road in staggered manner on one side of expressway shall be constructed as shown in the Plan & Profile of the project Expressway. Longitudinal grade of service road shall not be more than 0.5% at the junction with cross roads. At some locations the service road of 3.75m width is to be provided on both side of the expressway as indicated in the Plan & Profile of the project Expressway. In addition, 7.0m wide service road shall be provided, as follows:

7.0m wide carriageway on both sides in 200m length of approaches to minor bridges shall be provided.

7.0m wide carriageway service road on one side of the expressway shall be provided as under mentioned.

Chainage of Nearest VUP/LVUP from Interchange		Side	Length of service road to be provided of 7.0m carriageway (Km)
From	To		
163+686	165+039	RHS	1.35
165+039	166+484	LHS	1.45
171+466	174+646	LHS	3.18
199+565	200+000	LHS	0.44

Service road shall be discontinued at the location of Major Bridges over rivers / canals and railway crossings.

The location of service roads can be changed after recommendation from Authority's Engineer and approval from Authority.

2.7. Vehicular and Pedestrian Underpass /Overpass

2.7.1 The locations of Vehicular and Pedestrian Underpass are given later in this section. Change in the location of Vehicular / Light Vehicular / Pedestrian Underpass (VUP/ LVUP/ PUP) can be made as per site requirements subject to recommendation of Authority's Engineer and approval from Authority. Change in location of underpass shall not constitute as Change of Scope under Change of Scope clause mentioned elsewhere in the agreement or any other claim whatsoever.

2.7.2 The Vehicular / Light Vehicular / Pedestrian underpass shall be constructed using such construction material/methods/technologies so as to ensure uninterrupted flow of traffic / pedestrian on cross roads. Diversion of traffic (applicable only in case of VUP and LVUP) or restriction of paved width of cross roads shall not generally be permitted. In special circumstances with the approval of Authority Engineer, diversion road having paved width not less than 7.0m shall be constructed and maintained in good condition, to the satisfaction of Authority Engineer, during construction of underpass.

2.7.3 The VUP / LVUP / PUP in the median portion (3.0m) of the expressway shall remain open to sky and concrete barrier shall be provided on all four sides to enclose the

opening. In cross road of LVUP, 1.5m raised footpath on either side shall be provided. Lined drain on cross road along the abutment/footpath of VUP/ LVUP/PUP shall be constructed to drain out the water from the underpass, efficiently. The traffic in the approaches of VUP/ LVUP/PUP shall be guided by providing metal beam crash barrier along-with other means such as road studs etc. so that the traffic doesn't collide with the abutment/pier of the structure/footpaths. Traffic calming measures are to be provided at the junction of service road and cross roads.

2.7.4 Deleted.

2.7.5 The requirement of Vehicular Underpass (VUPS) along the project expressway is as under:

Sr. No.	Chainage	Type of Structure	Right span (m)	Minimum Vertical Clearance (m)	Skew angle (degree)	Width on Expressway (m)
1	169+595	VUP	1 x 12	5.5	3	2 x 17.5
2	172+691	VUP	2 x 12	6.5	0	2 x 17.5
3	182+490	VUP	1 x 12	5.5	13	2 x 17.5
4	188+345	VUP	1 x 12	5.5	43	2 x 17.5
5	194+725	VUP	2 x 12	5.5	29	2 x 17.5

2.7.6 The requirement of Light Vehicular Underpass (LVUPs) along the project expressway is as under:

Sr. No.	Chainage	Type of Structure	Right span (m)	Skew angle (degree)	Minimum Vertical Clearance (m)	Width on Expressway (m)
1	155+248	LVUP	1 x 10.5	9	4.5	2 x 17.5
2	165+039	LVUP	1 x 10.5	13	4.5	LHS-21.25, RHS-26.25
3	171+466	LVUP	1 x 10.5	44	4.5	2 x 17.5
4	173+477	LVUP	1 x 10.5	0	4.5	2 x 17.5
5	176+984	LVUP	1 x 10.5	36	4.5	2 x 17.5
6	179+050	LVUP	1 x 10.5	0	4.5	2 x 17.5
7	181+550	LVUP	1 x 10.5	38	4.5	2 x 17.5
8	183+981	LVUP	1x10.5	0	4.5	2 x17.5
9	184+800	LVUP	1x10.5	0	4.5	2 x17.5
10	199+565	LVUP	1 x 10.5	14	4.5	2 x 17.5

Note: One additional LVUP of size 1x10.5x4.5 has been proposed on link road of double trumpet interchange adjacent to expressway at chainage 172+700.

2.7.7 The requirement of Pedestrian Underpass (PUPs) along the project expressway is as under:

Sr. No.	Chainage	Type of Structure	Right Span (m)	Minimum Vertical Clearance (m)	Skew Angle (Degree)	Width on Expressway (m)
1	150+956	PUP	1 x 7.0	3.5	0	2 x 17.5
2	152+275	PUP	1 x 7.0	3.5	0	2 x 17.5
3	153+010	PUP	1 x 7.0	3.5	0	2 x 17.5
4	156+955	PUP	1 x 7.0	3.5	0	2 x 17.5
5	158+627	PUP	1 x 7.0	3.5	0	2 x 17.5
6	161+521	PUP	1 x 7.0	3.5	0	2 x 17.5
7	163+543	PUP	1 x 7.0	3.5	0	LHS-20.25, RHS-22.25
8	168+439	PUP	1 x 7.0	3.5	0	2 x 17.5
9	170+118	PUP	1 x 7.0	3.5	0	2 x 17.5
10	179+710	PUP	1 x 7.0	3.5	0	2 x 17.5
11	180+610	PUP	1 x 7.0	3.5	0	2 x 17.5
12	186+651	PUP	1 x 7.0	3.5	0	2 x 17.5
13	189+162	PUP	1 x 7.0	3.5	0	2 x 17.5
14	191+967	PUP	1 x 7.0	3.5	0	2 x 17.5
15	192+845	PUP	1 x 7.0	3.5	0	2 x 17.5
16	196+000	PUP	1 x 7.0	3.5	0	2 x 17.5
17	198+125	PUP	1 x 7.0	3.5	0	2 x 17.5

2.8. Typical cross-sections of the Project Expressway

The typical cross sections of different types required in different segments of the Project Expressway and typical cross-section schedule are attached in Annex–II of Schedule-B.

3. Intersection and Grade Separators

Properly designed grade separated intersections shall be provided at the locations and of the types and features given in the table below:

a) At-grade intersections - Nil
b) Grade separated intersection with /without ramps are:

Sr. No.	Proposed Chainage (Km)	Type of Structure	Right Span of Fly over (m)	Skew angle (degree)	Width of Structure on Expressway (m)	Type of Interchange
1	164+330	Fly over (on Cross Road)	2 x 30	0	2 x 17.5	Diamond Interchange with Toll Booth
2 (a)	174+646	Fly over (on cross road)	2 x 30	4	2 x 17.5	Double Trumpet Interchange with Toll Booth
2 (b)	174+646	Fly over (for loop on cross road)	2 x 30	0	2 x 12.75	

Note: 1- The layout of these interchanges are attached as Annex-III of Schedule-B. The flyover shall be constructed using such construction material/methods /technologies so as to ensure uninterrupted flow of traffic on cross roads. Diversion of traffic or restriction of paved width of cross roads shall not generally be permitted. In special circumstances (to be acceptable to Authority Engineer), with the approval of Authority Engineer, diversion road having paved width not less than 7.0m shall be constructed and maintained in good condition to the satisfaction of Authority Engineer, during the construction of flyover.

2- The minimum 175m (4 x 175m) length of approaches to Flyover on all four sides shall be constructed to full height using R. E. wall.

3- Merging/ Diverging shall be Parallel type.

4- All junctions shall be properly designed with channelisers and control devices.

4. Road Embankment and Cut Section

The height of the embankment shall be measured with respect to the Finished Road Levels. No section of the expressway in general shall be overtopped. The finished pavement profile of main carriageway for the total project length shall be designed so that the bottom of the sub grade is minimum 1.0m above the Highest Flood Level (HFL)/ High water table /NGL/Pond level, whichever is more, and for service road, top of subgrade is not less than 1.0m high above HFL/ High water table /NGL/Pond level, whichever is more. While designing the embankment the provisions of clause 1.4.7 of Part-I, Volume-II of Guidelines to Expressways published by IRC in April 2010 shall also apply.

The batter shall be treated in accordance to clause 4.4.6 of IRC: SP:42-2014.

For embankment height (including subgrade) more than 6m, the slopes shall be checked for safe design against failure. On Expressway and service road embankment having less than 6m height, turfing with sods / use of geo synthetics /geo cells / stone pitching or any other method as per MoRTH / IRC shall be adopted for slope protection and on embankment having more than 6m height, geo cells / stone / concrete block pitching will be provided for slope protection. In main carriageway / Service road embankment the toe wall / retaining wall along with drainage system shall be provided wherever indicated in the Plan & Profile drawings and apart from the toe wall/retaining wall requirement indicated in the Plan & profile; the toe wall/retaining wall along with drainage system shall be provided to contain the footprint of the earthwork so that all the features shown in the TCS are accommodated in the ROW provided. These provisions of toe/retaining wall are in addition to the requirement of R.E. wall provision mentioned elsewhere in this annexure for Flyovers and ROB.

5. Pavement Design

Flexible Pavement

Pavement design shall be carried out with IRC: 37 and pavement shall consist of Granular Sub Base layer, Wet Mix macadam layer, Dense Bituminous Macadam and Bituminous concrete layers. Cemented base and sub-base shall not be allowed. The pavement layers shall be designed for design traffic MSA as below:

Sr. No.	Chainage (in Km)		Length (in Km)	Minimum Effective soil CBR for design (%)	MSA
	From	To			
1	149+000	173+600	24.600	5	100
2	173+600	200+000	26.400	5	73

In Bituminous Concrete (BC) layer, Crumbed Rubber Modified Bitumen (CRMB) / Polymer Modified Bitumen (PMB) shall be used. Bitumen and Emulsion for the Project shall be procured from GOI / Public Sector refineries only.

To ensure internal drainage of the pavement structure, the granular sub-base layer shall extend to full width across the shoulders in the embankment. The edges of GSB shall be day lighted as per clause 5.2.1 (Fig. 5.5) of IRC: SP:42-2014. The composition of Pavement Layers of the paved shoulders shall be the same as that of the adjacent carriageway. Service road shall be designed for design traffic of 5 MSA.

Rigid Pavement

Rigid pavement, at Toll/Ramp Plaza location will be designed as per latest IRC guidelines considering 30 years design life. The paved shoulders adjoining the rigid pavement shall also be rigid having the same composition as that of the rigid pavement.

6. Drainage

Drainage arrangements shall be provided as per Section – 9 of the IRC:SP:99-2013. Storm water drains of adequate capacity for drainage of surface runoff shall be constructed along the Project Expressway. The bored well system of drains (Rain Water Harvesting) shall be properly designed and placed at every 500m interval on both sides in order to recharge the ground water as an environmental mitigation measures.

The slope of longitudinal storm water drain shall not be less than 0.1% for lined and unlined drains. All along the main carriageway (+ in service road at locations where embankment height is more than 6 m), roadside Kerb Channel drain (on both sides, except on horizontal curves where the drain shall be on the inner side only) outside the paved shoulder shall be provided, with connecting chutes at not more than 20m c/c spacing with energy dissipation basin at toe of embankment, connected with storm water drain to drain off the water. Median drainage at curves shall be provided as per clause 7.2.4 of Guidelines for Expressways, Part-I, Volume-II published by IRC with arrangement of collection chamber and shall be extended on the outer side of the embankment through buried pipes of sufficient size. In super-elevated sections of the expressway proper arrangement using connecting CC drains for drainage of raised carriageway shall be made to drain out the water through median drain. Proper arrangement at the Outlet pipe of median drain shall be made to protect the embankment slope from erosion.

Note: Realignment of nalla/drain/canal at chainages 153+152, 156+284, 160+875, 163+888 and 194+057 shall be done as indicated in plan & profile in consultation with the Authority Engineer.

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7. Design of Structures

Please refer to Schedule-D.

7.1.1. New culverts shall be constructed along the Project Expressway as under:

Expressway box culverts (m)			Service road box culverts (m)			Ramps / Loops (m)		
1 x 2 x 2	1 x 3 x 3	1 x 5 x 3	1 x 2 x 2	1 x 3 x 3	1 x 5 x 3	1 x 2 x 2	1 x 3 x 3	1 x 5 x 3
52 Nos.	22 Nos.	01 No.	*Please refer Note 2			21 Nos	4 Nos.	Nil

Note:

1. Location of culverts shall be finalized in consultation with Authority's Engineer.
2. *The culverts of same type and size as provided in expressway shall also be provided in service road (one or both sides) as indicated in plan & profile drawing.

7.1.2. New bridges

New bridge at the following location on the Project Expressway shall be constructed.

Major Bridges on Expressway and Service road

Sr. No.	Major Bridges on Main Carriageway				Crossing	Major Bridges on Service Road/Slip Road/Ramp/Loops				
	Proposed Chainage	Right Length	Skew Angle	Width		Location	Right Length	Skew Angle	Width	Remark
1	157+760	840	0	2 x 17.5	Betwa River	-	-	-	-	-
2	184+365	60	0	2 x 17.5	River	-	-	-	-	-

Minor Bridges on Expressway and Service road

Sr. No.	Minor Bridges on Main Carriageway				Minor Bridges on Service Road/Slip Road/Ramp/Loops				
	Proposed Chainage	Right Length	Skew Angle	Width	Location	Right Length	Skew Angle	Width	Remark
1	150+051*	32.7	21	2 x 17.5	Adjacent to main carriageway	14	21	10	Service Road
2	152+908	50	0	2 x 17.5	Adjacent to main carriageway	50	0	10	Service Road
3	153+152	21	0	2 x 17.5	Adjacent to main carriageway	21	0	10	Service Road
4	156+284	10	0	2 x 17.5	Adjacent to main carriageway	10	0	10	Service Road
5	159+000	8.7	30	2 x 17.5	-	-	-	-	-
6	159+593	10	0	2 x 17.5	-	-	-	-	-
7	160+875	19.7	20	2 x 17.5	-	-	-	-	-
8	161+086	21	0	2 x 17.5	-	-	-	-	-

Sr. No.	Minor Bridges on Main Carriageway				Minor Bridges on Service Road/Slip Road/Ramp/Loops				
	Proposed Chainage	Right Length	Skew Angle	Width	Location	Right Length	Skew Angle	Width	Remark
9	163+888	14.8	10	2 x 17.5	Adjacent to main carriageway	14.8	5.986	10	Service Road
10	-	-	-	-	Adjacent to main carriageway KM 163+888	14.8	5.986	11.5	Slip Road LHS
11	-	-	-	-	Adjacent to main carriageway KM 163+888	14.8	5.986	11.5	Slip Road RHS
12	165+525**	10	13	2 x 17.5	-	-	-	-	-
13	166+484*	37.3	21	2 x 17.5	Adjacent to main carriageway	23.3	21	10	Service Road
14	167+967*	18.1	25	2 x 17.5	Adjacent to main carriageway	10.9	25	10	Service Road
15	170+985*	15	0	2 x 17.5	Adjacent to main carriageway	6	0	10	Service Road
16	172+390	29	15	LHS-17.5m, RHS-22.25m	Adjacent to main carriageway	29	15	10	Service Road
17	176+640*	15	0	2 x 17.5	-	-	-	-	-
18	177+900*	24.7	45	2 x 17.5	Adjacent to main carriageway	10.6	45	10	Service Road
19	182+655	9.8	10	2 x 17.5	Adjacent to main carriageway	9.8	10	10	Service Road
20	185+562	10	60	2 x 17.5	Adjacent to main carriageway	10	60	10	Service Road
21	185+848	18.3	30	2 x 17.5	Adjacent to main carriageway	18.3	30	10	Service Road
22	187+130*	20	0	2 x 17.5	Adjacent to main carriageway	10	0	10	Service Road
23	189+080	10	0	2 x 17.5	Adjacent to main carriageway	10	0	10	Service Road
24	191+751*	22.7	25	2 x 17.5	Adjacent to main carriageway	13.6	25	10	Service Road
25	192+410*	25.7	50	2 x 17.5	Adjacent to main carriageway	12.9	50	10	Service Road
26	194+057	13.1	35	2 x 17.5	Adjacent to main carriageway	13.1	35	10	Service Road

Sr. No.	Minor Bridges on Main Carriageway				Minor Bridges on Service Road/Slip Road/Ramp/Loops				
	Proposed Chainage	Right Length	Skew Angle	Width	Location	Right Length	Skew Angle	Width	Remark
27	194+892	20.8	30	2 x 17.5	Adjacent to main carriageway	20.8	30	10	Service Road
28	197+257*	20.5	35	2 x 17.5	Adjacent to main carriageway	9.8	35	10	Service Road

Note: 1- Deck Level for bridges on main carriageway should not be less than as given in Road Profile; if required from hydraulic considerations it may be increased. The same deck level as provided for bridges on main carriageway shall be provided for bridges on service road also (except bridges over canal on service road and at Chainages 152+908, 153+152,163+888,172+390 and 194+892;wherein the deck level shall be governed by hydraulic parameters/ considerations, and get approval of Authority's Engineer).

2 In design of Structures the loadings are to be considered as per IRC 6 including Special class vehicle loading as specified in Schedule D.

3- For Bridges over canals on main carriageway, the length of bridge will constitute of canal section, it's inspection road on one side and spoil bank on other side. The face of abutment shall be beyond the toe of canal embankment as shown in the standard x-section of the canal as provided by Irrigation Department or as per site condition whichever is more. Minimum 5.5m vertical clearance shall be provided for canal's inspection road.

4- For Bridges over canals on service road, the service road and canal's inspection road will intersect each other at the same level. Deck level and span of bridge shall be fixed as per hydraulic considerations subject to concurrence from the concerned department.

5-* the structures at these major/minor bridge locations includes an underpass (min. 7.0m wide and 5.5m vertical clearance) to serve as an canal/nala /drain inspection road

6-# the structures at these locations include minor bridges on service roads on both sides.

7- All structures including PUP/LVUP/VUP/ROB/Flyover and Bridges having skew angle less than 10 degree shall be provided with "Strip Seal Expansion Joints with sinus plate".

8- The work of major/minor bridge is inclusive of all protection works and guide bunds (if required).

9** the structures at this location includes an underpass (min. 7.0m wide and 3.5m vertical clearance) to serve as an canal/nala/drain/inspection road.

7.1.3. Drainage System for Bridge Decks

2.5% cross slope and water spouts at suitable interval shall be provided.

7.1.4. Road over-bridges

Sr. No.	Chainage	Type of Structure	Total Right Length (m)	Skew angle (degree)	Width on Expressway (m)
1	176+110	ROB	81.236	12	2 x 17.5

Note:

1. The approaches to ROB in length not less than 200m (4 x 200m) on all sides shall be constructed in full height using R.E. Wall. GAD for the ROBs is attached in the drawings folder Volume IV: Drawings.
2. Structure type & Configuration and horizontal & vertical clearance at railway lines to be provided shall be prescribed by the Railways.

8. Traffic Control Devices and Road Safety Devices

Traffic control devices and road safety devices shall be provided in accordance with Section 10 of the IRC: SP:99-2013.

9. Roadside Furniture

Please refer to Schedule-C & Schedule-D.

10. Landscaping and Plantation

Landscaping and plantation on both sides of the expressway, in the median, interchange locations, Toll Plaza and O & M areas shall be done as per IRC:SP - 21.

11. Entry / Exit Ramps

Entry / Exit ramps for entering into or exiting from the Project Expressway shall only be provided at the Designated Interchanges. The merging and demerging lanes, drainage arrangements etc in cross road (AH/NH/SH/MDR/ODR) shall be provided by the EPC contractor as approved by the concerned department owning the road.

12. Slope Protection

Please refer to schedule-C and Schedule-D.

13. Rainwater Harvesting

For the Project Expressway; ground water recharging / rain water harvesting structures shall be provided at every 500 m interval on both sides. A sample drawing for rain water harvesting structures in Fig. 7-A-1 of Guidelines for Expressways Part-I, Volume-II published by IRC may be referred to.

14. Miscellaneous Items

i. Restoration of cross roads to the original condition within ROW at Flyovers, VUPs and LVUPs, PUP locations and cross roads connecting Service roads.

ii. Hume pipe ducts in full expressway width; having internal diameter not less than 600mm; are to be provided at 2Km interval to facilitate utilities crossing as per MoRTH circular RW/NH-34066/2/95-S&R dated 25.10.99.

iii. Hume pipe culverts shall also be provided on NH/SH/MDR at Interchange locations having internal diameter not less than 1200mm in order to avoid blockage of drainage.

iv. Median opening/Crossing on the main carriageway shall be provided as per clause 2.14 of the Manual IRC:SP:99-2013 with median opening spacing increased to 8 km. Typical details of median crossings to be adopted are as per

figure 1.06C of Part-I, Volume-II of Guidelines to Expressways published by IRC in April 2010.

v. Use of Flyash in road construction shall be mandatory as per latest circulars of GOI's Ministry of Environment and Forest. Upto 30000 cum (compacted quantity) of flyash the amount reimbursed by the thermal power plant shall be credited to the EPC contractor. For quantities of flyash beyond 30000 cum (compacted quantity), an amount of Rs 94.0 per cum shall be deducted for the cost of earth and its cartage of 10km, from the amount to be reimbursed to the EPC contractor. This amount to be deducted shall also be adjusted for the percentage amount of the agreement cost above/below the cost put to tender and price adjustment as per clause 19.10 of EPC agreement.

vi. Ambulance: As per Schedule - C.

15. Change of Scope

The length of Structures and bridges specified hereinabove shall be treated as an approximate assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths specified in this Schedule-B shall not constitute a Change of Scope; save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13 of Agreement.

Annex - II

(Schedule-B)

TYPICAL CROSS SECTIONS

The typical cross sections of the project expressway are enclosed in Volume IV: Drawings.

Typical Cross sections Schedule is as follows:

Sl. No.	Design Chainage (Km)		TCS Type	Length (m)
	From	To		
1	149+000	150+051	TCS-2B	1051
2	150+051	150+269	TCS-3A	218
3	150+269	152+678	TCS-2A	2409
4	152+678	153+362	TCS-3A	684
5	153+362	155+248	TCS-2A	1886
6	155+248	156+079	TCS-2B	831
7	156+079	156+480	TCS-3B	401
8	156+480	156+760	TCS-1B	280
8A	156+760	156+991	TCS-2B	231
9	156+991	159+260	TCS-1	2269
9A	159+260	159+460	TCS-1A	200
9B	159+460	161+521	TCS-1	2061
10	161+521	163+297	TCS-2B	1776
11	163+297	165+324	Refer Interchange Drawing	2027
12	165+324	166+724	TCS-3A	1400
13	166+724	167+735	TCS-2A	1011
14	167+735	168+165	TCS-3A	430
15	168+165	169+595	TCS-2A	1430
16	169+595	170+778	TCS-2B	1183
17	170+778	171+030	TCS-3B	252
18	171+030	171+193	TCS 3C	163
19	171+193	171+432	TCS-2	239
20	171+432	171+840	TCS-3C	408
21	171+840	172+150	TCS-3A	310
22	172+150	174+850	Refer Interchange Drawing	2700
23	174+850	175+860	TCS-1	1010
24	175+860	176+370	TCS-4	510
25	176+370	176+952	TCS-1	582
26	176+952	177+658	TCS-2A	706
27	177+658	178+068	TCS-3A	410
28	178+068	178+218	TCS-2A	150
29	178+218	179+696	Wayside Amenity (Refer Plan & Profile Drawings)	1478
30	179+696	182+490	TCS-2A	2794
31	182+490	182+861	TCS-3B	371
32	182+861	184+063	TCS-2B	1202
33	184+063	184+755	TCS-1	692
34	184+755	185+417	TCS-2B	662
35	185+417	186+016	TCS-3B	599
36	186+016	186+907	TCS-2B	891

Sl. No.	Design Chainage (Km)		TCS Type	Length (m)
	From	To		
37	186+907	187+347	TCS-3B	440
38	187+347	188+109	TCS-2B	762
39	188+109	188+385	TCS-2	276
40	188+385	188+868	TCS-2A	483
41	188+868	189+293	TCS-3A	425
42	189+293	191+553	TCS-2A	2260
43	191+553	191+993	TCS-3A	440
44	191+993	192+150	TCS-2A	157
45	192+150	192+587	TCS-3A	437
46	192+587	193+798	TCS-2A	1211
47	193+798	194+213	TCS-3A	415
48	194+213	194+725	TCS-2A	512
49	194+725	195+093	TCS-3B	368
50	195+093	197+073	TCS-2B	1980
51	197+073	197+503	TCS-3B	430
52	197+503	199+565	TCS-2B	2062
53	199+565	200+000	TCS-3A	435

Annex - III

(Schedule-B)

LAYOUT OF FLYOVERS

The layout of flyovers/interchanges/slip roads of the project expressway is enclosed in Volume IV: Drawings.

SCHEDULE-C

(See clause 2.1)

PROJECT FACILITIES

1. Project Facilities

The Contractor shall construct the Project Facilities in accordance with the provisions of this Agreement. Such Project Facilities shall include:

(a) Toll plazas and ramp plazas;
(b) Roadside furniture;
(c) Lighting / illumination;
(d) Pedestrian facilities;
(e) Landscaping & tree plantation;
(f) Traffic and medical aid posts;
(g) Telecom System;
(h) Advanced traffic management system (ATMS) - NIL;
(i) Wayside Amenities;
(j) Toilet Block;

2. Description of Project Facilities

Each of the Project Facilities have been described in Annex-I of this Schedule-C

Annex – I
(Schedule-C)

1. Project Facilities for Project Expressway

The Contractor shall construct the Project Facilities described in this Annex-I to form part of the Project Expressway. The Project Facilities shall include:

(a) Toll plazas and ramp plazas;
(b) Roadside furniture;
(c) Lighting / illumination;
(d) Pedestrian facilities;
(e) Landscaping and tree plantation;
(f) Traffic and medical aid posts;
(g) Telecom System;
(h) Advanced traffic management system (ATMS)- NIL;
(i) Wayside Amenities;
(j) Toilet Block;

2. Description of Project Facilities

a) Toll Plaza: One Toll Plaza as per section-12 of IRC:SP:99-2013, complete in all respect including service area, Toll Plaza complex, room of sufficient size for ATMS control center, Traffic Aid Post and medical aid post, toll booth, canopy etc complete shall be provided at Km 174+646. Layout of Toll Plazas shall be designed for 8 lanes all lanes shall be enabled for combination of cash, smart card and ETC system and 2x1 Over dimensioned vehicle lane) expandable to 10 lanes for ETC system. For lanes under future widening earthwork with turfing shall be done. Proper access shall be provided for Toll plaza building. Equipment for toll plaza shall be as per section - 12 of the Manual. If any software/hardware/equipment is determined to be necessary by the Authority's Engineer / Authority for safe and efficient operation of toll / Ramp Plaza and is not mentioned in the "Manual", the required software/hardware/equipment shall be provided by the EPC contractor.

i. Toll Plaza Complex/Building as per Section 12 of the Manual along with Control Centre for ATMS shall be provided for Toll Plaza. A power sub-station including generator of sufficient capacity shall be installed to meet out all power requirement of the toll plaza complex; booths and external lighting. The size of the office complex shall be with adequate provision for future expansion taking into consideration various requirements.

ii. Prevention of Overloading: Weigh in Motion Systems to prevent overloading: Toll plaza/ toll booth location shall also be provided with system for checking and preventing overloading of vehicles at toll plaza/booth. For this purpose; weigh in motion systems at approaches to each

toll lane are to be installed. Separate space along with static weigh bridge shall be provided and area to hold off-loaded goods from overloaded vehicles shall also be provided after the toll barriers for each entry direction of travel.

iii. Vehicle Rescue Posts/Cranes: The EPC Contractor shall provide cranes of capacity as prescribed in Clause 14.4 of Contract Agreement at suitable location with all necessary equipment so that it can reach the site of the incident within 30 minutes of call and clear the disabled/accident met vehicles. It shall also be fitted with GPS based Vehicle Tracking System to monitor its movement on 24 hours x 7 days of a week basis.

iv. Ambulance: The EPC contractor shall provide an GPS fitted ambulance with all life saving equipment, trained staff and first aid items including the supply of consumable items which will be replenished as and when required during DLP period of 5 years.

v. EPC contractor shall also provide all required furniture for Toll Plaza complex, Toll Booth, Lane canopy camera in all lanes, Cash room camera, cash vault camera, Fog light, speed breaker to slow down vehicles, PA system and ID scan camera etc in all booths.

vi. Balancing culverts: sufficient number of culverts shall be provided on each ramp/slip road of the interchange.

Interchange/Ramp Plaza:

There will be 2 Toll Booths with a canopy at entry/exit of interchange (Km 163+330) as given in schedule-B with 2 nos. of toll lanes (i.e. one toll lane for normal sized vehicles and one toll lane for over dimensioned vehicle) on each links (ramps/slips). All toll booths shall be equipped for ETC and shall have toll/fee through cash or smart card as a back-up. At Interchange/Slip Road locations all necessary building construction, provisions, equipment, as per section -12 of the Manual, the state of the art facilities etc. shall be provided for smooth toll collection, safety to commuters and facilities for commuters, toll collection and O & M staff. Along with WIM, separate space for static weigh bridge, supply and installation of static weigh bridge and area to hold off-loaded goods from overloaded vehicles shall be provided after the toll barriers for each entry direction of travel. EPC contractor shall also provide all required furniture for tool booths, ramp plaza complex, Lane canopy camera in all lanes, cash room camera, Cash Vault camera, Fog Light, Speed Breaker to slow down vehicles, PA System and ID scan camera etc in all booths. If any software/hardware/equipment/structure is determined to be necessary by the Authority's Engineer / Authority for safe and efficient operation of Ramp Plaza and Toll

collection and the same is not mentioned in the "Manual", or in the schedule the required software/hardware/equipment/structure shall be provided by the EPC contractor.

Interchange / Slip Road locations shall be provided with Sub-Complex and Sub-Centre including medical aid post as per requirement and to provide user services like sale of Passes/ Smart Cards/ OBUs; public interaction counter; public parking space; etc. Sufficient number of culverts shall be provided on each ramp/slip road of the interchange.

Balancing culverts: sufficient number of culverts shall be provided on each ramp/slip road of the interchange.

b) **Traffic Control Devices, Road Safety Devices and Roadside Furniture:** Traffic Control Devices, Road Safety Devices and roadside furniture shall be provided as per Section – 10 and 12 of IRC:SP:99-2013:

i. **Road Signs:** Road Signs include roadside signs; chevron signs; overhead signs and kerb mounted signs along the entire Project Expressway and service road.

All road signs shall be of Prismatic Grade Sheeting corresponding to Class 'C' Sheeting described in IRC: 67 and any of the types VIII; IX or XI as per ASTM D-4956-09. The road signs and overhead signs erected on the Project Expressway and service road with regard to requirement of number of signs, type and size of sign, size of letter, color of sign, layout of sign; etc. including signs installations shall conform to Section-10 and Section-12 of "Manual" and IRC: 67, Code of Practice for Road Signs and where the said codes are silent, other codes in the same order of preference as in Clause 1.2 of Annex-1, Schedule-D shall be used. Chevron signs shall be installed on curves and interchange loops/ramps. In addition to signs prescribed in "Manual" other signs such as signs showing safety slogans, toll free numbers, nearby hospital and police station facilities, lane discipline signs on gantry, headway etc. will also be provided as directed by Authority's Engineer.

The overhead signs shall be placed on a structurally sound gantry or cantilever structure made of tubular structure or steel structure. The final locations shall be finalized in consultation with the Authority's Engineer. The height, lateral clearance and installation of the sign structures shall be as per the MoRT&H/IRC guidelines.

- **Overhead Signs**: The minimum numbers are being mentioned as under. Minimum 32 Nos. Cantilever Type;
- Minimum 08 Nos. Overhead Gantry Type (4-lane width) on each side

Design and location of route marker signs for Project Expressway shall be as per the IRC: 67.

On cross roads where interchange/slip roads has been provided, necessary information signboards on cross roads on both sides at 500m, 1Km., 2Km., and 5 Km. distance from an interchange/slip roads, shall also be fixed suitable for the category of cross road

ii. **Pavement Markings**: Pavement markings shall cover the entire Project Expressway and service road (on 7.0m wide portions) and shall be as per section- 10 of the "Manual" and IRC: 35. These markings shall be applied to road centre lines; edge lines; continuity line; stop lines; give-way lines; diagonal/chevron markings; zebra crossing and at parking areas, toll booths etc. by means of an approved self-propelled machine which has a satisfactory cut-off valve capable of applying broken lines automatically.

Road markings other than on main carriageway edges (both shoulder and median side) shall be of hot applied thermoplastic materials with glass reflectorizing beads as per relevant sub clauses of MoRT&H specifications;

Raised profile edge lines as per Clause 7.7 of IRC 35 shall be provided on main carriageway, loop, ramp and slip road edges (both sides i.e. shoulder and median side/right lane).

Acrylic water based road marking paint shall be used for kerb, concrete barrier painting, and to display details of structure number; span arrangement etc on all culverts and bridges with required description as per MoRT&H guidelines.

iii. **Boundary (ROW) Stones**: These shall be provided for the entire Project Expressway at an interval of 100m c/c as per clause 10.8 of the "Manual".

iv. **100m & Kilometer Distance marker**: Type design of Km. and 100m marker shall be as per Annex- II to Schedule 'C'. The markers shall be of Prismatic Grade Sheeting corresponding to Class 'C' Sheeting described in IRC: 67 and any of the types VIII; IX or XI as per ASTM D-4956-09. These shall be provided for the entire Project Expressway. The arrangement for fixing and placement on expressway [illegible]

kilometer distance marker shall be as per IRC:67 and for 100m marker as per "Guidelines for Expressways".

Crash Barrier: shall be provided as per clause 10.7 of section-10 of IRC: SP:99-2013. Thrie Beam crash barrier shall be installed all along the Project Expressway on earthen shoulders on both sides. W-Beam crash barrier shall be installed on both sides of median edge. Concrete Crash Barrier shall be provided at all interchanges including ramps / loops, major / minor bridges, , underpasses, viaducts, culverts on service road and ROBs etc.

Retro-reflective (same material as of road signs and Fluorescent yellow / white colour) Stickers (150mm width) shall be provided on alternative vertical posts of W beam barrier throughout.

v. **Fencing**: As the Expressway is completely access controlled facility; fencing is its integral part to help enforcement of the acquired access rights. Access control extends to the limits of the legal access control on the ramps i.e.; along the ramps to the beginning of the taper on the local road. Barbed wire conforming to IS:278 -1978 shall be fixed on RCC (M25) posts of minimum size 110 x 110mm. RCC posts shall be embedded in M15 grade concrete to a depth of 700mm below ground having size of 500x500mm. The height of fencing shall be 2.5m above ground. All exposed surfaces shall be painted with synthetic enamel paint over cement primer.

On the side where service road is being provided, fence will be placed in between expressway and service road. On the side where service road is not being provided the fence will be placed at ROW edge. Fencing shall be discontinued at some locations of cart tracks where 3x3 m box structures are proposed. Provision of fencing at these locations to avoid unauthorized entry shall be finalized in consultation with the Authority's Engineer and Authority.

Additional chain link fencing (2.5m height) in transverse direction from barbed wire fencing to both sides of crash barrier of structures are to be provided at all structures.

vi. **Raised Pavement Markers, Reflection pavement markers and Solar Studs**:

Raised pavement markers shall be provided as per clause 7 of IRC 35 – 2015 on both shoulder edges and median sides. Reflection pavement markers and solar studs shall be as per clause 10.5 and Table 10.4 of "Manual". Reflective pavement Markers shall be provided on entire length of expressway (including stretches not covered under Table 10.4 of Manual) along the median edge line and shoulder edge line of main carriageway and ramps and loops.

vii. **Delineators** shall be provided as per clause 10.4 of "Manual". At merging/diverging areas; service areas; ramps of interchanges; bridges and their approaches; the spacing shall be reduced to 30m. The design; location and materials to be used for road delineators shall be as per IRC: 79.

viii. **Blinker Lights**: Yellow flashing lights using solar power with full alternative power back-up shall be provided to alert the drivers about oncoming interchange; major bridge and toll plaza.

Glare Reduction: devices shall be provided as per clause 10.11 of the "Manual" on horizontal curves of radius less than 4000m in radius. In the double trumpet/ trumpet configuration interchange loops and on the roads connecting the two loops of double trumpet interchange, anti-glare screen shall be provided in the median.

c) **Lighting/Illumination**: External and Internal Lighting will be as per section-15 of the "Manual". Street Lighting shall be provided at the locations of toll / ramp plaza, interchanges/slip roads and lighting on structures such as major bridges, ROB's, Flyovers, Minor Bridges and Underpasses including high mast at toll plaza, interchange/slip roads . A power connection of appropriate load (including load other than illumination such as load of air conditioner, computers, other instruments installed on toll/ramp plaza, load required due to solar plant) shall be taken from state electricity department at above locations including all expenses. The use of solar power is optional in lieu of a regular power connection for isolated locations such as Bridges, ROBs, underpasses and flyovers. Provision of adequate capacity Diesel Generator sets as standby arrangement for loads as mentioned above shall be made at Toll / Ramp Plaza, Interchange and Slip road.

Various themes and layouts of the lighting system together with type of luminaries for different locations shall be specially designed and finalized in consultation with the Authority's Engineer and Authority.

Arrangement of lighting installations shall be staggered except on curves.

The layout and design of lighting poles; their height and spacing shall be finalized in consultation with the Authority's Engineer / Authority so that the minimum illumination level prescribed in the aforesaid clauses can be achieved.

Overhead electrical power and telecommunication lines erected within the ROW by the EPC Contractor shall be provided with adequate clearance so that safe use of the highway is not affected.

Overhead lines would be erected only at places where underground cabling through duct is not possible. Vertical and horizontal clearances shall conform to IRC: 32.

d) **Pedestrian Facilities:** Pedestrian / Cattle Underpasses on Main Carriageway and on the loop of interchanges to be provided at the locations as given in Schedule-B.

e) **Landscaping & Tree Plantation:** Landscaping of Road shall be as per IRC SP-21. Four rows of tree on the side where service road is not provided and 2 row of tree on the side of service road shall be provided. Compensatory afforestation shall be undertaken within ROW as prescribed in environment and forest clearances. Landscape treatment shall be provided in the entire open areas near major bridges, at interchanges, toll / ramp plaza, and O & M areas.

Planting along the Project Expressway shall follow a variety of schemes depending upon location requirement as per the IRC: SP: 21. The choice of trees to be planted shall also be made as per IRC: SP:21; "Manual of Landscaping". Eucalyptus (all species) is not recommended for planting. Local, indigenous species that grow in that area shall be preferred.

On medians and island: planting of dust and gaseous substance-absorbing shrubs shall be provided.

The treatment of the highway embankment slopes shall be as per the recommendations of IRC: 56; depending upon the soil type involved and the provisions mentioned elsewhere in this document.

Visibility of any signs; signals or any other devices erected for traffic control, traffic guidance and/or information shall not be obstructed by plantation.

The central island of trumpet and loop area of interchanges has space for attractive landscaping which provide scope for both soft and hard landscape. Special attention will be given that each interchange has a distinct and unique landscape based on some theme. The theme and design of landscaping of each interchange will blend with the local surroundings. Careful selection of plant species will be done in order to match the climatic conditions to merge with the surrounding area. Rainwater/ ground water recharging system should also be integrated with landscaping in order to provide proper drainage to avoid ponding of water. The plantation will be inter-mixed with evergreen species and

seasonal flowers. Plantation of flowering species will be done in such a way that each area has different colour pattern. The outer margins of the central islands in the loops of interchange must have low ground covers to avoid any vision obstruction of the drivers to ensure visibility. The central portions of these islands will be provided with objects of any art; creation of pleasing/ attractive land pattern including plantation of trees keeping the aspect of vision in view. Designer lights along the periphery of the islands and central lighting in the form of high masts will be suitably provided for ensuring proper illumination of the area. Different types of water fountains may also be erected at the interchanges. No private advertisements; commercial information; hoardings etc. shall be permitted inside the interchange area. The scheme of landscape for each interchange has to be approved by the Authority's Engineer and the Authority.

f) **Traffic and Medical Aid Posts:** At Interchange Sub Complex / Sub Center locations.

g) **Telecom system:** All necessary hardware, equipment, software, optical fibre cable etc. required for Communication System to interconnect Toll Plaza, Ramp Plazas /Toll Booths etc within the interchange area will be provided by the Contractor.

h) **Advanced Traffic Management System (ATMS):** ATMS is not part of Scope of the Contractor; However, the Authority shall implement the ATMS through a separate contract. The Contractor shall work in tandem with the ATMS contractor appointed by the Authority.

i) **Wayside Amenities:** Wayside amenity is not part of Scope of the Contractor. However, the Authority shall implement the Wayside Amenities through a separate contract. The Contractor shall work in tandem with Wayside Amenities contractor appointed by the Authority. An area of 10 hectares has been designated for this purpose. However, EPC Contractor shall construct 2-lane wide carriageway approach road for access to the proposed wayside amenities as shown in Annexure –IV to the Schedule 'C' at Project chainage 179+050 on RHS. The crust composition of the approach road shall be similar to the crust of main carriageway. Merging and demerging lanes on main carriage way shall be provided in required length by EPC Contractor.

j) **Toilet Block:** Separate Toilet Blocks with full facilities for public use shall be provided within the toll plaza for public access. The provisions listed below are

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a) 4 Nos. urinals (Ladies) along with wash basin

b) 4 Nos. urinals (Gents) along with wash basin

c) 2 Nos WC in each washroom

d) Drinking Water facilities shall also be provided.

e) Water Supply/Electrical fixtures shall also be provid d.

f) Landscaping along with parking space shall also be provided.

k) Transverse Bar Markings of thickness 15 mm should be provided at every merging and diverging locations and shall also be provided on main carriageway at 15km interval.

Annex - II

(Schedule-C)

100m&Kilometer Distance Marker

The type design of Km and 100m marker of the project expressway are enclosed in Volume IV: Drawings.

SCHEDULE-D

(See clause 2.1)

SPECIFICATIONS AND STANDARDS

1. Project Expressway

Subject to the provisions of Paragraph 2 of this Annex-I; Project Expressway shall conform to the Manual of Specifications and Standards for Expressways (IRC: SP:99-2013) published by Indian Roads Congress.

Annex-I

(Schedule-D)

1. Specifications and Standards

1.1. All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Expressways (IRC:SP:99-2013) published by Indian Roads Congress in November, 2013 referred to as the "Manual" and Indian Road Congress (IRC) Codes and Standards and MORTH Specifications for Road and Bridge Works which shall include policy circulars; guidelines; manuals and special publications issued in respect thereof by IRC or MoRTH as the case may be, from time to time and shall incorporate all amendments and/or modifications to such codes and standards which are available to public 60 days before the Bid due date unless otherwise specified in the Schedule.

1.2. Where the aforesaid Manuals, guidelines, codes, standards and specifications are silent on any aspect; the following standards in order of preference shall be adopted in consultation with the Authority Engineer; unless otherwise specified in this Schedule.

i. Guidelines for Expressways, Part – 1 & 2, published by IRC on behalf of Ministry of Road Transport and Highways in April 2010 referred to as the "Guidelines"
ii. Bureau of Indian Standards (BIS)
iii. American Association of State Highway and transport Officials (AASHTO)
iv. American Society for testing Materials (ASTM)
v. Euro Codes
vi. Suitable specifications / standards devised by the UPEIDA
vii. Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

All items of building works shall conform to Central Public Works Department (CPWD) Specifications for Class 1 building works and standards given in the National Building Code (NBC). If some specific provisions for building works are provided in IRC/MoRTH specifications; the same shall prevail over the CPWD/NBC provisions. For this purpose; building works shall be deemed to include road furniture; fencing; roadside facilities; landscape elements; toll plaza and any other works incidental to the building works.

1.3 In design of Structures the loadings are to be considered as per IRC 6 including Special Class vehicle loading.

2. Quality Assurance Requirements:

The Authority has appointed Consultants for carrying out surveys; investigations and preparing the Project report. Copy of the Project Report prepared by the Consultants may be taken for reference only. The EPC Contractor shall carry out its own independent

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Gawar Const. Ltd. HISAR DSC-378, Sec. 16-17

surveys; investigations and designs. Within 30 days from appointed date; the EPC Contractor shall draw up a quality assurance manual (QAM) covering the quality system; quality assurance plan (QAP) and documentation for all aspects of bridge, road and building works and send three copies each to the Authority Engineer for review. The class of quality assurance shall be extra high QA (Q-4) for all aspects of project; covering design and drawing; procurement; materials and workmanship.

Notwithstanding anything to the contrary contained in Paragraph 1 above; the following Specifications and Standards shall apply to the Project Expressway; and for purposes of this Agreement; the aforesaid Specifications and Standards shall be deemed to be amended to the extent set forth below:

Deviation from Schedule-D

S. No.	*Item to be deviated*	*Description of Deviation*
1.	Service Road	3.75m wide carriageway on one side of the expressway in a staggered manner except at ROBs and Major Bridge locations, shall be provided. At minor bridge locations, the service road shall be of 7.0m wide carriageway for a minimum length of 200m on both sides of the minor bridge. On other locations mentioned in 2.6.1 of Annex- I of Schedule-B, service road of 7.0m carriageway is to be provided. Apart from the above arrangement, services roads shall be provided at requisite locations on both sides of the expressway for movement of localized traffic as per details mentioned in 2.6.1 of Annex- I of Schedule-B. Service roads shall be designed as a flexible pavement suitable for 5 MSA. Cemented base and sub base shall not be allowed.
2.	Median/Median opening	5.5 m raised median shall be provided. Median opening crossing on the main carriageway shall be provided at 8km interval
3.	Earthen Shoulders	The earthen shoulder on expressway and service road shall be constructed with earth suitable for sub-grade and compacted to the same density as applicable to the sub-grade. To protect against erosion, turfing shall be done over shoulders.
4.	Normal Cross fall	Carriageway & Paved shoulder – 2.5% Earthen shoulder – 3%
5a.	Longitudinal Grade	Minimum gradient – 0.3%
5b.	Minimum Gradient for drainage for side drains	Minimum longitudinal gradient for drainage consideration is 0.1% for both lined and unlined drains.
6.	Fencing	On the expressway side where service road is not being provided, 2.5m high barbed wire fencing shall be provided at ROW but on the other side where service road is being provided, the 2.5m high fence shall be provided in

<table>
<tr><th>S. No.</th><th>Item to be deviated</th><th>Description of Deviation</th></tr>
<tr><td></td><td></td><td>between service road and expressway.
Minimum 110x110 mm size posts for the barbed wire fencing shall be of M25 grade RCC.
Additional chain link fencing (2.5m height) in transverse direction from barbed wire fencing to both sides of crash barrier of structures are to be provided at all structures.</td></tr>
<tr><td>7.</td><td>Typical Cross - sections</td><td>Typical cross-sections shall be as per Schedule-B.</td></tr>
<tr><td>8.</td><td>Clear Zone</td><td>Instead of providing recoverable slope; normal embankment of 1V:2H (may be flatter as per height considerations) shall be adopted and W-Beam crash barrier shall be provided throughout the length of Expressway on both outer sides.</td></tr>
<tr><td>9.</td><td>Standards for design of Interchanges</td><td><table><tr><th></th><th>Design speed (Kmph)</th><th>Radius (m)</th><th></th></tr><tr><th></th><th></th><th>Desirable</th><th>Absolute Minimum</th></tr><tr><td>Loop</td><td>60</td><td>140</td><td>n/a</td></tr><tr><td>Semi Direct</td><td>70</td><td>195</td><td>n/a</td></tr><tr><td>Direct</td><td>70</td><td>195</td><td>n/a</td></tr></table></td></tr>
<tr><td>10.</td><td>a) Road Embankment

b) Embankment Slope</td><td>a) The finished pavement profile for the total project length shall be designed so that in main carriageway, the bottom level of the sub grade always remains minimum 1.0m above the Highest Flood Level (HFL)/ High Water Table / Pond Level, at all points of the embankment cross section and in service road the top of subgrade shall not be less than 1.0m high above HFL at all points of the embankment cross section.
b) The minimum side slope of 1V: 2H could be provided if found adequate from stability consideration. The embankment slope is envisaged to have Geo cells / stone or concrete block pitching / turfing as protection for embankment height up to 6 m and for height more than 6m, stone or concrete block pitching / geo cells shall be provided, but for water front areas, such as river/ nala etc. only stone/concrete block pitching shall be provided.</td></tr>
<tr><td>11.</td><td>6-lane structures</td><td>All structures shall be of 6-lane standards. The carriageway is being developed for 2x2 lane expressway while structures will be constructed for 2x3 lane expressway (with same surfacing and pavement as of 2x2 lane over structures). Soft shoulder width near structure shall be tapered in 1:10 taper to match 6 lane structures. The extra 1+1 lanes over structures shall be closed for traffic by fixing W-Beam crash barrier; over deck in such a way that it can be removed easily when the need arises, without damaging the structure. However, on four (4) structures (of VUP/LVUP) on each side of main carriageway (total eight), tapering of MBCB is to be done to facilitate the parking of Police cars on extra lane. CC tiles to be provided in taper length on both sides, between</td></tr>
</table>

S. No.	Item to be deviated	Description of Deviation
		main carriageway pavement and MBCB. Road studs shall be fixed on traffic edge line to demarcate the boundary for police parking.
12.	Duct for utility services on structures	Carrying of various utilities over the structure shall be governed as per MORTH circular RW/NH-34066/2/95-S&R dated 25.10.99
13.	Width of structures	As provided in Annexure – I to Schedule-B
14.	Alternate Design	i) The requirements stated in the Manual or the Guidelines are the minimum. The EPC contractor may however adopt international practices, alternative specifications; materials and standards to bring in innovation in design and construction provided they are better or comparable with the standards prescribed in the "Manual" and the "Guidelines". The proposed alternative specifications and techniques, including those which are not included in the MoRTH/IRC specifications shall be supported with authentic standards and specifications mentioned in clause 1.2 above. The Typical cross-sections given in Annexure-I to Schedule-B shall be adopted.
		ii) Alternative design for structures / bridges can be adopted by EPC Contractor in accordance with design requirements subject of review of the same by Authority Engineer/Authority.
15.	Crash Barriers	On outer edge of expressway Semi-rigid Thrie beam crash barrier is to be provided throughout the length on both sides except at structures, loops, ramps and slip roads, where concrete crash barrier shall be provided. In median also two rows (one on each carriageway side) Semi-rigid W-beam crash barriers are to be provided.
16.	Vertical Clearance at Structures	i. For PUP, the minimum vertical clearance shall be 3.5 m ii. 4.5m vertical clearance at LVUP locations is required to cater to the local agrarian, Bus & overloaded tractors to cross under the proposed expressway as per site requirements
		iii. For VUP, the minimum vertical clearance shall be 5.5 m except VUP at Ch.172+691 where the vertical clearance shall be 6.50m. iv. For Flyover over NH/SH and Expressways, the minimum vertical clearance shall be 6.50 m
17.	Design Life of Structures	All the components of structures shall be designed for a service life of 100 years except appurtenances like crash barriers; wearing surface; expansion joints and bearings. All the requirements to achieve durability and serviceability shall be implemented in design; construction and maintenance.

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S. No.	Item to be deviated	Description of Deviation
18.	Roughness	Roughness not more than 1800 mm/km for each lane as measured by laser profilometer.
19	Glare Reduction	Glare reduction devices are to be provided on horizontal curves of radius less than 4000m. In the double trumpet/ trumpet configuration interchange loops and on the roads connecting the two loops of double trumpet interchange, anti- glare screen shall be provided in the median
20	Transverse Bar Marking	Thickness of transverse bar marking shall be 15mm.

SCHEDULE-E

(See Clauses 2.1 and 14.2)

MAINTENANCE REQUIREMENTS

1. Maintenance Requirements

1.1. The Contractor shall; at all times maintain the Project Expressway in accordance with the provisions of this Agreement; Applicable Laws and Applicable Permits.

1.2. The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph 2 of this Schedule-E within the time limit specified therein and any failure in this behalf shall constitute non-fulfillment of the Maintenance obligations by the Contractor. Upon occurrence of any breach hereunder; the Authority shall be entitled to effect reduction in monthly lump sum payment as set forth in Clause 14.6 of this Agreement; without prejudice to the rights of the Authority under this Agreement; including Termination thereof.

1.3. All Materials; works and construction operations shall conform to the MORTH Specifications for Road and Bridge Works; and the relevant IRC publications. Where the specifications for a work are not given; Good Industry Practice shall be adopted.

2. Repair/Rectification of Defects and Deficiencies

The obligations of the Contractor in respect of Maintenance Requirements shall include repair and rectification of the Defects and deficiencies specified in Annex-I of this Schedule-E within the time limit set forth therein.

3. Other Defects and Deficiencies

In respect of any Defect or deficiency not specified in Annex-I of this Schedule-E; the Authority's Engineer may; in conformity with Good Industry Practice; specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards; and any deviation or deterioration beyond the permissible limit shall be repaired or rectified by the Contractor within the time limit specified by the Authority's Engineer.

4. Extension of Time Limit

Notwithstanding anything to the contrary specified in this Schedule-E; if the nature and extent of any Defect or deficiency justifies more time for its repair or rectification than the time specified herein; the Contractor shall be entitled to additional time in conformity with Good Industry Practice. Such additional time shall be determined by the Authority's Engineer and conveyed to the Contractor and the Authority with reasons thereof.

5. Emergency Repairs/Restoration

Notwithstanding anything to the contrary contained in this Schedule-E; if any Defect; deficiency or deterioration in the Project Expressway poses a hazard to safety or risk of damage to property; the Contractor shall promptly take all reasonable measures for eliminating or minimizing such danger.

6. Daily Inspection by the Contractor

The Contractor shall; through its engineer; undertake a daily visual inspection of the Project Expressway and maintain a record thereof in a register to be kept in such form and manner as the Authority's Engineer may specify. Such record shall be kept in safe custody of the Contractor and shall be open to inspection by the Authority and the Authority's Engineer at any time during office hours.

7. Pre-Monsoon Inspection / Post-Monsoon Inspection

The Contractor shall carry out a detailed pre-monsoon inspection of all bridges; culverts and drainage system before [1st June] every year in accordance with the guidelines contained in IRC: SP35. Report of this inspection together with details of proposed maintenance works as required on the basis of this inspection shall be sent to the Authority's Engineer before the [10th June] every year. The Contractor shall complete the required repairs before the onset of the monsoon and send to the Authority's Engineer a compliance report. Post monsoon inspection shall be done by the [30th September] and the inspection report together with details of any damages observed and proposed action to remedy the same shall be sent to the Authority's Engineer.

8. Repairs on Account of Natural Calamities

All damages occurring to the Project Expressway on account of a Force Majeure Event or default or neglect of the Authority shall be undertaken by the Authority at its own cost. The Authority may instruct the Contractor to undertake the repairs at the rates agreed between the Parties.

Annex - I
(Schedule-E)
Repair/rectification of Defects and deficiencies

The Contractor shall repair and rectify the Defects and deficiencies specified in this Annex-I of Schedule-E within the time limit set forth in the table below.

Nature of Defect or deficiency		Time limit for repair /rectification
ROADS		
(a)	**Carriageway and paved shoulders**	
(i)	Breach or blockade	Temporary restoration of traffic within 24 hours; permanent restoration within 15 (fifteen) days
(ii)	Roughness value exceeding 1,800 mm in a stretch of 1 km (as measured by laser profilometer)	120 (one hundred and twenty) days
(iii)	Pot holes	24 hours
(iv)	Any cracks in road surface	15 (fifteen) days
(v)	Any depressions; rutting exceeding 10 mm in road surface	30 (thirty) days
(vi)	Bleeding/skidding	7 (seven) days
(vii)	Any other defect/distress on the road	15 (fifteen) days
(viii)	Damage to pavement edges	15 (fifteen) days
(ix)	Removal of debris; dead animals	6 hours
(b)	**Granular earth shoulders; side slopes; drains and culverts**	
(i)	Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the	7 (seven) days
(ii)	Edge drop at shoulders exceeding 40mm	7 (seven) days
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	30 (thirty) days
(iv)	Rain cuts/gullies in slope	7 (seven) days
(v)	Damage to or silting of culverts and side	7 (seven) days
(vi)	Desilting of drains in urban/semi-urban	24 hours
(vii)	Railing; parapets; crash barriers; barbed wire fencing	7 (seven) days (Restore immediately if causing safety hazard)
(c)	**Road side furniture including road sign and pavement marking**	
(i)	Damage to shape or position; poor visibility or loss of retro- reflectivity	48 hours
(ii)	Painting of km stone; railing; parapets; crash barriers	As and when required/Once every year
(iii)	Damaged/missing road signs requiring replacement	7 (seven) days
(iv)	Damage to road mark ups	7 (seven) days
(d)	**Road lighting**	
(i)	Any major failure of the system	24 hours

Nature of Defect or deficiency		Time limit for repair /rectification
ROADS		
(ii)	Faults and minor failures	8 hours
(e)	**Trees and plantation**	
(i)	Obstruction in a minimum head-room of 5 m above carriageway or obstruction in visibility of road signs	24 hours
(ii)	Removal of fallen trees from carriageway	4 hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f)	**Rest area**	
(i)	Cleaning of toilets	Every 4 hours
(ii)	Defects in electrical; water and sanitary installations	24 hours
(g)	**[Toll Plaza]**	
(h)	**Other Project Facilities and Approach**	
(i)	Damage in approach roads; pedestrian facilities; truck lay- byes; bus-bays; bus-shelters; cattle crossings; [Traffic Aid Posts; Medical Aid Posts] and service roads	15 (fifteen) days
(ii)	Damaged vehicles or debris on the roads	4 (four) hours
(iii)	Malfunctioning of the mobile crane	4 (four) hours
Bridges		
(a)	**Superstructure**	
(i)	Any damage; cracks; spalling/scaling Temporary measures Permanent measures	 within 48 hours within 15 (fifteen) days or as specified by the Authority's Engineer
(b)	**Foundations**	
(i)	Scouring and/or cavitations	15 (fifteen) days
(c)	**Piers; abutments; return walls and**	
(i)	Cracks and damages including settlement and tilting; spalling; scaling	30 (thirty) days
(d)	**Bearings (metallic) of bridges**	
(i)	Deformation; damages; tilting or shifting of bearings	15 (fifteen) days Greasing of metallic bearings once in a year
(e)	**Joints**	
(i)	Malfunctioning of joints	15 (fifteen) days
(f)	**Other items**	
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts; weep holes and vent-	3 (three) days
(iii)	Damage or deterioration in kerbs; parapets; handrails and crash barriers	3 (three) days

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Nature of Defect or deficiency		Time limit for repair /rectification
ROADS		
		(immediately within 24 hours if posing danger to safety)
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs; pitching; apron; toes; floor or guide	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days

SCHEDULE-F

(See Clauses 3.1.7(A))

APPLICABLE PERMITS

1. **Applicable Permits**

1.1. The Contractor shall obtain; as required under the Applicable Laws; the following Applicable Permits:

a) Permission of the State Government for extraction of boulders from quarry;

b) Permission of Village Panchayats and Pollution Control Board for installation of crushers;

c) License for use of explosives;

d) Permission of the State Government for drawing water from river/reservoir;

e) License from inspector of factories or other competent Authority for setting up batching plant;

f) Clearance of Pollution Control Board for setting up batching plant;

g) Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;

h) Permission of Village Panchayats and State Government for borrow earth; and

i) Any other permits or clearances required under Applicable Laws.

1.2. Applicable Permits; as required; relating to environmental protection and conservation shall have been procured by the Authority in accordance with the provisions of this Agreement.

SCHEDULE-G

(See Clauses 7.1.1; 7.5.3 and 19.2)

FORM OF BANK GUARANTEE
Annex - I
(See Clause 7.1.1)

Performance Security

Chief Executive Officer
Uttar Pradesh Expressways Industrial Development Authority
C-13; 2nd Floor; Paryatan Bhawan
Vipin Khand; Gomti Nagar
Lucknow – 226010

WHEREAS:

A. .....(hereinafter called the "Contractor") and the CEO; Uttar Pradesh Expressway Industrial Development Authority (hereinafter called the "Authority") have entered into an agreement (hereinafter called the "Agreement") for the construction of the .....; subject to and in accordance with the provisions of the Agreement.

B. The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations; under and in accordance with the Agreement; during the {Construction Period/ Defects Liability Period and Maintenance Period} (as defined in the Agreement) in a sum of Rs..... cr. (Rupees ..... crore) (the "Guarantee Amount").

C. We; ..... through our branch at ..... (the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") by way of Performance Security.

NOW; THEREFORE; the Bank hereby; unconditionally and irrevocably; guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Agreement; and agrees and undertakes to pay to the Authority; upon its mere first written demand; and without any demur; reservation; recourse; contest or protest; and without any reference to the Contractor; such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim; without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority; under the hand of an officer not below the rank of [Manager in the Uttar Pradesh Expressways Industrial Development Authority]; that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive; final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank; notwithstanding any differences between the Authority and the Contractor; or any dispute between them pending before any court; tribunal; arbitrators or any other authority or body; or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee; the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank; whether by their absorption with any other body or corporation or otherwise; shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary; and the Bank hereby waives any necessity; for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty; without affecting in any manner the liability of the Bank under this Guarantee; to vary at any time; the terms and conditions of the Agreement or to extend the time or period for the compliance with; fulfillment and/ or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time; and from time to time; any of the rights and powers exercisable by the Authority against the Contractor; and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority; and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance; indulgence; act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfillment; compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.

7. Notwithstanding anything contained hereinbefore; the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ****. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee; the Bank shall be discharged from its liabilities hereunder.

9. The Bank undertakes not to revoke this Guarantee during its currency; except with the previous express consent of the Authority in writing; and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request; demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch; which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith; and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice; when given by post; it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

UPEIDA LUCKNOW

Gawar Const. Ltd. HISAR DSS-378, Sec. 16-17

Signed and sealed this ..... day of .....; 20..... at .....

SIGNED; SEALED AND DELIVERED

For and on behalf of the BANK by:

(Signature)
(Name)
(Designation)
(Code Number)
(Address)

NOTES:

(i) The bank guarantee should contain the name; designation and code number of the officer(s) signing the guarantee.

(ii) The address; telephone number and other details of the Head Office of the Bank as well as of issuing Branch should be mentioned on the covering letter of issuing Branch.

Annex – II
(SCHEDULE-G)
(See Clause 7.5.3)

FORM FOR GUARANTEE FOR WITHDRAWAL OF RETENTION MONEY

Chief Executive Officer
Uttar Pradesh Expressways Industrial Development Authority
C-13; 2nd Floor; Paryatan Bhawan
Vipin Khand; Gomti Nagar
Lucknow – 226010

WHEREAS:

A. .....(hereinafter called the "Contractor") has executed an agreement (hereinafter called the "Agreement") with the CEO; Uttar Pradesh Expressway Industrial Development Authority (hereinafter called the "Authority") for the construction of the .....; subject to and in accordance with the provisions of the Agreement.

B. In accordance with Clause 7.5.3 of the Agreement; the Contractor may withdraw the retention money (hereinafter called the "Retention Money") after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.

C. We; ..... through our branch at ..... (the "Bank") [this bank guarantee is to be issued by a nationalized bank] have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") for the amount of Rs. --------- cr. (Rs.----------crore) (the "Guarantee Amount").

NOW; THEREFORE; the Bank hereby unconditionally and irrevocably guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably undertakes to pay to the Authority; upon its mere first written demand; and without any demur; reservation; recourse; contest or protest; and without any reference to the Contractor; such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim; without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority; under the hand of an officer not below the rank of [Manager in the Uttar Pradesh Expressways Industrial Development Authority]; that the Contractor has committed default in the due and faithful performance of all or any of its obligations for under and in accordance with the Agreement shall be conclusive; final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final; and binding on the Bank; notwithstanding any differences between the Authority and the Contractor; or any dispute between them pending before any court; tribunal; arbitrators or any other authority or body; or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee; the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank; whether by their absorption with any other body or corporation or otherwise; shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

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4. It shall not be necessary; and the Bank hereby waives any necessity; for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty; without affecting in any manner the liability of the Bank under this Guarantee; to vary at any time; the terms and conditions of the Retention Money and any of the rights and powers exercisable by the Authority against the Contractor; and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority; and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance; indulgence; act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Retention Money.

7. Notwithstanding anything contained hereinbefore; the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect 90 (ninety) days after the date of the Completion Certificate specified in Clause 12.4 of the Agreement.

9. The Bank undertakes not to revoke this Guarantee during its currency; except with the previous express consent of the Authority in writing; and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request; demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch; which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith; and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice; when given by post; it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

Signed and sealed this .... day of ....; 20........ at ....

UPEIDA LUCKNOW

Gawar Const. Ltd. DSS-378, Sec.16-17

SIGNED; SEALED AND DELIVERED

For and on behalf of the BANK by:

(Signature)
(Name)
(Designation)
(Code Number)
(Address)

NOTES:

(i) The bank guarantee should contain the name; designation and code number of the officer(s) signing the guarantee.

(ii) The address; telephone number and other details of the Head Office of the Bank as well as of issuing Branch should be mentioned on the covering letter of issuing Branch.

Annex – III
(SCHEDULE-G)
(See Clause 19.2)

FORM FOR GUARANTEE FOR ADVANCE PAYMENT

Chief Executive Officer
Uttar Pradesh Expressways Industrial Development Authority
C-13; 2nd Floor; Paryatan Bhawan
Vipin Khand; Gomti Nagar
Lucknow – 226010

WHEREAS:

A. .....(hereinafter called the "Contractor") has executed an agreement (hereinafter called the "Agreement") with the CEO; Uttar Pradesh Expressway Industrial Development Authority (hereinafter called the "Authority") for the construction of the .....; subject to and in accordance with the provisions of the Agreement.

B. In accordance with Clause 19.2 of the Agreement; the Authority shall make to the Contractor an interest bearing advance payment (herein after called "Advance Payment"); and that the Advance Payment shall be made in three installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a nationalized bank for an amount equivalent to 100% (one hundred percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second/third} installment of the Advance Payment is Rs. ---------- cr. (Rupees ------ crore) and the amount of this Guarantee is Rs. ------- cr. (Rupees ------ crore) (the "Guarantee Amount").

C. We; ..... through our branch at ..... (the "Bank") have agreed to furnish this bank guarantee (hereinafter called the "Guarantee") for the Guarantee Amount.

NOW; THEREFORE; the Bank hereby; unconditionally and irrevocably; guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid installment of the Advance Payment under and in accordance with the Agreement; and agrees and undertakes to pay to the Authority; upon its mere first written demand; and without any demur; reservation, recourse; contest or protest; and without any reference to the Contractor; such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim; without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority; under the hand of an officer not below the rank of [Manager in the Uttar Pradesh Expressways Industrial Development Authority]; that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the installment of the Advance Payment under and in accordance with the Agreement shall be conclusive; final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and

binding on the Bank; notwithstanding any differences between the Authority and the Contractor; or any dispute between them pending before any court; tribunal; arbitrators or any other authority or body; or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee; the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank; whether by their absorption with any other body or corporation or otherwise; shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary; and the Bank hereby waives any necessity; for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty; without affecting in any manner the liability of the Bank under this Guarantee; to vary at any time; the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time; and from time to time; any of the rights and powers exercisable by the Authority against the Contractor; and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority; and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance; indulgence; act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.

7. Notwithstanding anything contained hereinbefore; the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ****. Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date; the Bank shall be discharged from its liabilities hereunder.

9. The Bank undertakes not to revoke this Guarantee during its currency; except with the previous express consent of the Authority in writing; and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request; demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch; which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith; and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice; when given by post; it

shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

Signed and sealed this ..... day of .....; 20..... at .....

SIGNED; SEALED AND DELIVERED

For and on behalf of the BANK by:

(Signature)
(Name)
(Designation)
(Code Number)
(Address)

NOTES:

(i) The bank guarantee should contain the name; designation and code number of the officer(s) signing the guarantee.

(ii) The address; telephone number and other details of the Head Office of the Bank as well as of issuing Branch should be mentioned on the covering letter of issuing Branch.

SCHEDULE-H

(See Clauses10.1.4 and 19.3)

Contract Price Weightages

1.1 The Contract Price for this Agreement is **Rs. 1396.00 Crores**

1.2 Proportions of the Contract Pride for different stages of Construction of the Project Expressway shall be as specified below:

Item	Weightage in percentage to the Contract Price	Stage for Payment	% weightage
1	2	3	4
Road works including culverts	54.52	**A – New 4-lane Expressway (Flexible Pavement)**	
		(1) Earthwork up to top of the Embankment	29.27
		(2) Earthwork up to top of the sub-grade	4.66
		(3) Slope Protection: Turfing / stone or concrete block pitching / Geo Cells on slopes	2.93
		(4) Toe Wall / retaining wall	1.86
		(5) Sub-Base Course	12.47
		(6) Non Bituminous Base Course	9.89
		(7) Bituminous Base Course	13.61
		(8) Wearing coat	5.92
		B - New Service Road (Flexible pavement)	
		(1) Earthwork up to top of the Embankment	2.09
		(2) Earthwork up to top of the sub-grade	1.62
		(3) Slope Protection: Turfing / stone or concrete block pitching / Geo Cells on slopes	0.05
		(4) Toe Wall / retaining wall	0.88
		(5) Sub-Base Course	2.62
		(6) Non Bituminous Base Course	0.79
		(7) Bituminous Base Course	1.06
		(8) Wearing coat	0.50
		C - New Culverts: Culverts (length =<6m)	
		(1) On Main Carriageway	6.68
		(2) On Service Road	1.49
		(3) On Loops & Ramps	1.61
Minor Bridges/ Underpasses / Overpasses	12.33	**A - New Minor bridges for Main Carriageway (length > 6m and < 60m)**	
		(1) Foundation: On completion of the foundation work including foundations for wing and return walls, abutment/pier cap.	19.06
		(2) Sub- Structure: On completion of the Sub-structure work including wing and return walls, abutment/pier cap.	18.36
		(3) Superstructure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings,	11.22

Item	Weightage in percentage to the Contract Price	Stage for Payment	% weightage
1	2	3	4
		tests on completion etc. complete in all respect.	
		(4) Approaches: On completion of Retaining walls, Slope Protection: stone or concrete block pitching on slopes, protection works complete in all respect and fit for use.	7.67
		(5) Guide Bunds and River Training Works:- On completion of Guide Bunds and river Training Works complete in all respects.	1.48
		B - New Minor bridges for Service Roads (length > 6m and < 60m)	
		(1) Foundation: On completion of the foundation work including foundations for wing and return walls, abutment/pier cap.	2.23
		(2) Sub- Structure: On completion of the Sub-structure work including wing and return walls, abutment/pier cap.	3.59
		(3) Superstructure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	1.30
		(4) Approaches: On completion of Retaining walls, Slope Protection: stone or concrete block pitching on slopes, protection works complete in all respect and fit for use.	0.70
		(5) Guide Bunds and River Training Works:- On completion of Guide Bunds and river Training Works complete in all respects.	0.27
		C - New Minor bridges for Loops & Ramps (length > 6m and < 60m)	
		(1) Foundation: On completion of the foundation work including foundations for wing and return walls, abutment/pier cap.	0.69
		(2) Sub- Structure: On completion of the Sub-structure work including wing and return walls, abutment/pier cap.	1.58
		(3) Superstructure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	0.45
		(4) Approaches: On completion of Retaining walls, Slope Protection: stone or concrete block pitching on slopes, protection works complete in all respect and fit for use.	0.46
		(5) Guide Bunds and River Training Works:- On completion of Guide Bunds and river Training Works complete in all respects.	0.15
		D - New Pedestrian Underpasses	
		(1) Foundation +Sub Structure: On	3.60

Item	Weightage in percentage to the Contract Price	Stage for Payment	% weightage
1	2	3	4
		completion of the foundation work including foundation for wing and return walls abutments, piers upto the abutment/pier cap.	
		(2) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road sign & markings, tests on completion etc. completion in all respect. Wearing Coat including expansion joints complete in all respects as specified	3.36
		E – Light Vehicular Underpass	
		(1) Foundation +Sub Structure: On completion of the foundation work including foundation for wing and return walls abutments, piers upto the abutment/pier cap.	8.68
		(2) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road sign & markings, tests on completion etc. completion in all respect. Wearing Coat including expansion joints complete in all respects as specified	4.01
		F – Vehicular Underpass	
		(1) Foundation +Sub Structure: On completion of the foundation work including foundation for wing and return walls abutments, piers upto the abutment/pier cap.	5.76
		(2) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road sign & markings, tests on completion etc. completion in all respect. Wearing Coat including expansion joints complete in all respects as specified	2.48
Major Bridge (length >60m) works and ROB/ flyovers, if any	14.39	**A- New Major Bridges**	
		(1) Foundation	25.35
		(2) Sub-structure	8.97
		(3) super-structure (including bearings)	27.86
		(4)Wearing Coat including expansion joints	0.20
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc.)	0.91
		(6) wing walls/return walls	
		(7) Guide Bunds, River Training works etc.	
		(8) Approaches (Retaining walls, Slope Protection: stone or concrete block pitching on slopes and protection works, etc)	0.73
		B- New ROB	
		(1) Foundation	2.03
		(2) Sub-structure	0.73

Item	Weightage in percentage to the Contract Price	Stage for Payment	% weightage
1	2	3	4
		(3) super-structure (including bearings)	2.77
		(4) Wearing Coat (a) in case of ROB-wearing coat including expansion joints complete in all respects as specified.	0.16
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc.)	0.09
		(6) wing walls/return walls	0.04
		(7) Approaches (Retaining walls/Reinforced Earth wall, etc. and protection works, etc.)	5.94
		C- New/Flyovers/Grade separators	
		(1) Foundation	4.14
		(2) Sub-structure	1.60
		(3) super-structure (including bearings)	3.36
		(4) Wearing Coat including expansion joints	0.40
		(5) Miscellaneous items like hand rails, crash barriers, road markings etc.)	0.08
		(6) wing walls/return walls	
		(7) Approaches (Retaining walls/Reinforced Earth wall, , etc. etc.)	14.62
Other works	18.76	(i) Toll Plaza	6.65
		(ii) Ramp Plaza	1.48
		(iii) Road work of Interchange at Loops & Ramps including pipe culverts at crossing of NH/SH/MDR	9.54
		(iv) Road side drains including chutes etc complete	26.00
		(v) Storm Water Drain	13.36
		(vi) Road signs, markings, distance markers, safety devices, etc.	3.67
		(vii) Fencing on both side of Expressway i/c boundary stones	2.56
		(viii) Raised median including w beam crash barrier, median drain, plantation etc.	27.28
		(ix) Road Side Plantation	0.31
		(x) Miscellaneous	0.00
		(a) Environmental mitigation measures	0.47
		(b) Providing Utility Crossing	0.40
		(c) Construction of Temporary diversion	0.22
		(d) Providing lighting on Major Bridges / minor Bridges / Underpasses/ Toll Plaza/ Ramp Plaza / Interchange / Slip Road	3.33
		(e) Providing high mast light on interchange / Toll Plaza / Slip Road	0.08
		(f) Landscaping	0.50
		(g) Rain water harvesting structures	1.26
		(h) Approach to wayside amenities & toilet block	2.60
		(i) Providing Ambulance	0.09
		(j) River/Nala Trainee and diversion works	0.17
		(k) Chequred tiles at Parking of vehicles on underpass	0.03

1.3 Procedure of estimating the value of work done

1.3.1 Road works

Procedure for estimating the value of road work done shall be as follows:-

Table 1.3.1

Stage of Payment	Percentage - weightage	Payment Procedure
A – New 4-lane Expressway (Flexible Pavement)		
(1) Earthwork up to top of the Embankment	29.27	Unit of measurement is linear length. Payment of each stage shall be made on pro-rata basis on completion of a stage in full length or 3 (three) km length.
(2) Earthwork up to top of the sub-grade	4.66	
(3) Slope Protection: Turfing / stone or concrete block pitching / Geo Cells on slopes	2.93	
(4) Toe Wall / retaining wall	1.86	
(5) Sub-Base Course	12.47	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or 3 (three) km length in half of carriageway width (i.e. 3 lanes) and payment shall be made accordingly.
(6) Non Bituminous Base Course	9.89	
(7) Bituminous Base Course	13.61	
(8) Wearing coat	5.92	
B- New Service Road (Flexible pavement)		
(1) Earthwork up to top of the Embankment	2.09	Unit of measurement is linear length in km. Cost per km shall be determined on pro-rata basis with respect to the total length of the service roads. Payment shall be made for completed service road in a length of 3 Kms
(2) Earthwork up to top of the sub-grade	1.62	
(3) Slope Protection: Turfing / stone or concrete block pitching / Geo Cells on slopes	0.05	
(4) Toe Wall / retaining wall	0.88	
(5) Sub-Base Course	2.62	
(6) Non Bituminous Base Course	0.79	
(7) Bituminous Base Course	1.06	
(8) Wearing coat	0.50	
C - New Culverts: Culverts (length =<6m)		
(1) On Main Carriageway	6.68	Cost of each culvert shall be determined on pro- rata basis with respect to the total number of culverts. Payment shall be made on the completion of three culverts.
(2) On Service Road	1.49	
(3) On Loops & Ramps	1.61	

@. For example; if the total length of bituminous work to be done is 100 km; the cost per km of bituminous work shall be determined as follows:

Cost per km = P x Weightage for road work x Weightage for bituminous work x (1/L)

Where; P= Contract Price

L = Total length in km

Similarly; the rates per km for other stages shall be worked out accordingly.

1.3.2 Minor Bridges and Underpasses/Overpasses.

Procedure for estimating the value of minor bridges and underpasses / Overpasses shall be as stated in table 1.3.2:

Table 1.3.2

Stage of Payment	Weightage	Payment Procedure
A - New Minor bridges for Main Carriageway (length > 6m and < 60m)		
(i) Foundation: On completion of the foundation work including foundations for wing and return walls, abutment/pier cap.	19.06	(i) Foundation: Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of each bridge subject to completion of at least two foundation of each bridge. In case where load testing is required for foundation, the trigger of first payment shall be included load testing also where specified.
(ii) Sub- Structure: On completion of the Sub-structure work including wing and return walls, abutment/pier cap.	18.36	(ii) Sub- Structure: Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of each bridge subject to completion of at least two sub-structure upto abutments/pier cap level of each bridge.
(iii) Super-Structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	11.22	(iii) Super-structure : Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure of atleast one span in all respects as specified in the column of "Stage of Payment" in this sub-clauses.
(iv) Approaches: completion of Retaining walls, stone / concrete Block pitching on slope, protection works complete in all respect and for for use.	7.67	(iv) Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.
(v) Guide Bunds and River Training Works:- On completion of Guide Bunds and river Training Works complete in all respects.	1.48	(v) Guide Bunds and River Training Works:- Payment shall be made on pro-rata basis on completion of a stage i.e. completion of Guide Bunds and River training Works approaches in all respect as specified.
B - New Minor bridges for Service Roads (length > 6m and < 60m)		
(i) Foundation: On completion of the foundation work including foundations for wing and return walls, abutment/pier cap.	2.23	(i) Foundation: Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of each bridge subject to completion of at least two

Stage of Payment	Weightage	Payment Procedure
		foundation of each bridge. In case where load testing is required for foundation, the trigger of first payment shall be included load testing also where specified.
(ii) Sub- Structure: On completion of the Sub-structure work including wing and return walls, abutment/pier cap.	3.59	(ii) Sub- Structure: Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of each bridge subject to completion of at least two sub-structure upto abutments/pier cap level of each bridge.
(iii) Super-Structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.	1.30	(iii) Super-structure : Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure of atleast one span in all respects as specified in the column of "Stage of Payment" in this sub-clauses.
(iv) Approaches: completion of Retaining walls, Slope Protection: stone or concrete block pitching / Geo Cells on slopes, protection works complete in all respect and fir for use.	0.70	(iv) Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.
(v) Guide Bunds and River Training Works:- On completion of Guide Bunds and river Training Works complete in all respects.	0.27	(v) Guide Bunds and River Training Works:- Payment shall be made on pro-rata basis on completion of a stage i.e. completion of Guide Bunds and River training Works approaches in all respect as specified.
C - New Minor bridges for Loops & Ramps (length > 6m and < 60m)		
(i) Foundation: On completion of the foundation work including foundations for wing and return walls, abutment/pier cap.	0.69	(i) Foundation: Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of each bridge subject to completion of at least two foundation of each bridge. In case where load testing is required for foundation, the trigger of first payment shall be included load testing also where specified.
(ii) Sub- Structure: On completion of the Sub-structure work including wing and return walls, abutment/pier cap.	1.58	(ii) Sub- Structure: Cost of each minor bridge shall be determined on pro rata basis with respect to the total linear length (m) of the minor bridges. Payment against sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of each bridge subject to completion of at least two sub-structure upto abutments/pier cap level of each bridge.
(iii) Super-Structure: On completion of the super-structure in all respects	0.45	(iii) Super-structure : Payment shall be made on pro-rata basis on

Stage of Payment	Weightage	Payment Procedure
including wearing coat, bearings, expansion joints, hand rails, crash barriers, road signs & markings, tests on completion etc. complete in all respect.		completion of a stage i.e. completion of super-structure of atleast one span in all respects as specified in the column of "Stage of Payment" in this sub-clauses.
(iv) Approaches: completion of Retaining walls, Slope Protection: stone or concrete block pitching / Geo Cells on slopes, protection works complete in all respect and fir for use.	0.46	(iv) Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.
(v) Guide Bunds and River Training Works:- On completion of Guide Bunds and river Training Works complete in all respects.	0.15	(v) Guide Bunds and River Training Works:- Payment shall be made on pro-rata basis on completion of a stage i.e. completion of Guide Bunds and River training Works approaches in all respect as specified.
D - New Pedestrian Underpasses		
(i) Foundation +Sub Structure: On completion of the foundation work including foundation for wing and return walls abutments, piers upto the abutment/pier cap.	6.50	(i) Foundation +Sub Structure: Cost of each underpass/overpass shall be determined on pro rata basis with respect to the total linear length (m) of the underpasses/overpasses. Payment against foundation +sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation + sub-structure of each Underpass/Overpasses subject to completion of atleast two foundations along with sub-structure upto abutment/pier cap level each underpass/overpass. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road sign & markings, tests on completion etc. completion in all respect. Wearing Coat including expansion joints complete in all respects as specified	3.36	(ii) Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure of atleast one span in all respects as specified in the column of "Stage of payment" in this sub-clause.
E - Light Vehicular Underpass		
(i) Foundation +Sub Structure: On completion of the foundation work including foundation for wing and return walls abutments, piers upto the abutment/pier cap.	8.68	(i) Foundation +Sub Structure: Cost of each underpass/overpass shall be determined on pro rata basis with respect to the total linear length (m) of the underpasses/overpasses. Payment against foundation +sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation + sub-structure of each Underpass/Overpasses subject to completion of atleast two foundations along with sub-structure upto abutment/pier cap level each underpass/overpass. In case where load testing is required for foundation, the trigger of first payment shall

Stage of Payment	Weightage	Payment Procedure
		include load testing also where specified.
(ii) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road sign & markings, tests on completion etc. completion in all respect. Wearing Coat including expansion joints complete in all respects as specified	4.01	(ii) Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure of atleast one span in all respects as specified in the column of "Stage of payment" in this sub-clause.
F – Vehicular Underpass		
(i) Foundation +Sub Structure: On completion of the foundation work including foundation for wing and return walls abutments, piers upto the abutment/pier cap.	5.76	(i) Foundation +Sub Structure: Cost of each underpass/overpass shall be determined on pro rata basis with respect to the total linear length (m) of the underpasses/overpasses. Payment against foundation +sub-structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation + sub-structure of each Underpass/Overpasses subject to completion of atleast two foundations along with sub-structure upto abutment/pier cap level each underpass/overpass. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Super-structure: On completion of the super-structure in all respects including wearing coat, bearings, expansion joints, hand rails, crash barriers, road sign & markings, tests on completion etc. completion in all respect. Wearing Coat including expansion joints complete in all respects as specified	2.48	(ii) Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure of at least one span in all respects as specified in the column of "Stage of payment" in this sub-clause.

1.3.3 Major Bridges works, ROB/RUB and Structures.

Procedure for estimating the value of major bridges works, ROB/RUB and structures shall be as stated in table 1:3:3:

Table 1.3.3

Stage of Payment	Weightage	Payment Procedure
A - New Major Bridges		
(i) Foundation	25.35	(i) Foundation : Cost of each Major Bridge shall be determined on pro rata basis with respect to the total linear length (m) of the Major Bridges. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of Major Bridge subject to completion of atleast two foundation of the Major Bridge. In case where load testing is required for foundation, the trigger of first payment shall be

Stage of Payment	Weightage	Payment Procedure
		included load testing also where specified.
(ii) Sub-structure	8.97	(ii) Sub-structure: Payment against sub-structures shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub structures of the Major Bridge subject to completion of atleast two sub-structures of abutment/pier upto abutment/pier cap level of the Major Bridge.
(iii) super-structure (including bearings)	27.86	(iii) Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super structure including bearings of atleast one span in all respect specified.
(iv)Wearing Coat including expansion joints	0.20	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.
(v) Miscellaneous items like hand rails, crash barriers, road markings etc.)	0.91	(v) Miscellaneous: Payment shall be made on completion of all miscellaneous work like hand rails, crash barriers, road markings etc complete in all respects as specified.
(vi) wing walls/return walls		(vi) Wing wall/return walls: Payment shall be made on completion of all wing walls/return wall complete in all respects as specified.
(vii) Guide Bunds, River Training works etc.		(vii) Guide Bunds, River Training works: Payment shall be made on completion of all guide bunds/river training works etc. complete in all respects as specified.
(viii) Approaches (Retaining walls, Slope Protection: stone or concrete block pitching on slopes and protection works, etc)	0.73	(viii) Approaches: Payment shall be made on completion of both approaches including Slope Protection: stone or concrete block pitching on slopes, protection works etc. complete in all respects as specified.
B New ROB		
(i) Foundation	2.03	(i) Foundation: Cost of each ROB/RUB shall be determined on pro rata basis with respect to the total linear length (m) of the ROBs/RUBs. Payment against foundation shall be made on pro-rata basis on completion of stage i.e. not less than 25% of the scope of foundation of the ROB/RUB subject to completion of atleast two foundations of the ROB/RUB. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	0.75	(ii) Sub-structure: Payment against Sub-Structures shall be made on pro-rata basis on completion of stage i.e. not less than 25% of the scope of the sub-structures of the ROB/RUB subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the ROB/RUB.
(iii) super-structure (including bearings)	2.77	(iii) super-structure: Payment shall be made on pro-rata basis on completion of stage i.e completion of sub-structures including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat (a) in case of ROB-wearing coat including expansion joints complete in all respects as specified.	0.16	(iv) Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.

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Stage of Payment	Weightage	Payment Procedure
(v) Miscellaneous items like hand rails, crash barriers, road markings etc.)	0.09	(v) Miscellaneous: Payment shall be made on completion of all miscellaneous work like hand rails, crash barriers, road markings etc complete in all respects as specified.
(vi) wing walls/return walls	0.04	(vi) Wing walls/return walls: Payment shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (Retaining walls/Reinforced Earth wall and Slope Protection: Turfing / stone or concrete block pitching / Geo Cells on slopes etc. and protection works, etc.)	5.94	(vii) Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of work in approaches of at least one ROB as specified in the column of "Stage of payment" in this sub-clause.
C - New/Flyovers/Grade separators		
(i) Foundation	4.14	(i) Foundation: Cost of each Structure shall be determined on pro rata basis with respect to the total linear length (m) of the structures. Payment against foundation shall be made on pro-rata basis on completion of stage i.e. not less than 25% of the scope of foundation of the structure subject to completion of atleast two foundations of the structure. In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.
(ii) Sub-structure	1.60	(ii) Sub-structure: Payment against Sub-Structures shall be made on pro-rata basis on completion of stage i.e. not less than 25% of the scope of the sub-structures of the structure subject to completion of atleast two sub-structures of abutments/piers upto abutment/pier cap level of the structures.
(iii) super-structure (including bearings)	3.36	(iii) super-structure: Payment shall be made on pro-rata basis on completion of stage i.e completion of sub-structures including bearings of atleast one span in all respects as specified.
(iv) Wearing Coat including expansion joints	0.40	(iv) Wearing Coat: Payment shall be made completion of wearing coat including expansion joints in all respects as specified.
(v) Miscellaneous items like hand rails, crash barriers, road markings etc.)	0.08	(v) Miscellaneous: Payment shall be made on completion of all miscellaneous work like hand rails, crash barriers, road markings etc complete in all respects as specified.
(vi) wing walls/return walls		(vi) Wing walls/return walls: Payment shall be made on completion of all wing walls/return walls complete in all respects as specified.
(vii) Approaches (Retaining walls/Reinforced Earth wall and Slope Protection: Turfing/stone or concrete block pitching / Geo Cells on slopes, etc. and protection works, etc.)	14.62	(vii) Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of work in approaches of at least one Flyover / Grade Seperator as specified in the column of "Stage of payment" in this sub-clause.

1.3.4 Other Works

Procedure for estimating the value of other works done shall be as stated in table 1.8.1

Table 1.3.4

Stage of Payment	Weightage	Payment procedure
(i) Toll Plaza	6.65	Unit of measurement is each completed toll plaza, payment of each toll plaza shall be made on pro rata basis with respect to the total of all toll plazas. Toll Plaza shall be From start of tapering section to end of tapering section of Toll Plaza and shall be inclusive of all items including earthwork, pavement, All buildings, toll booths, TMS, ATMS control room and other works etc. complete
(ii) Ramp Plaza	1.48	Unit of measurement is completed all ramp plazas at one interchange location. Payment of all ramp plaza at one interchange location shall be made on pro rata basis with respect to the total of all interchanges. Ramp Plaza shall be From start of concrete pavement section to end of concrete pavement section of Ramp Plaza and shall be inclusive of all items including earthwork, pavement, all building, toll booths, TMS, and other works etc. complete
(iii) Road work of Interchange at Loops & Ramps including pipe culverts at crossing of NH/SH/MDR	9.54	Payment shall be made on pro rata basis for completed Interchange. All earthwork, pavement work on the loop / ramp etc of interchange including culvert crossing for NH/SH/MDR etc
(iv) Road side drains including chutes etc. complete	26.00	Unit of Measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten percent) of the total length
(v) Storm Water Drain	13.36	
(vi) Road signs, markings, distance markers, safety devices, etc.	3.67	
(vii) Fencing on both side of Expressway i/c boundary stones	2.56	
(viii) Raised median including w beam crash barrier, median drain, plantation	27.28	
(ix) Road Side / Avenue Plantation	0.31	
(x) Miscellaneous		
(a) Environmental mitigation measures	0.47	Payment shall be made on pro-rata basis on completed works / facilities.
(b) Providing Utility Crossing	0.40	
(c) Construction of Temporary diversion	0.22	
(d) Providing lighting on Major Bridges / minor Bridges / Underpasses/ Toll Plaza/ Ramp Plaza / Interchange / Slip Road	3.33	
(e) Providing high mast light on interchange / Toll Plaza / Slip Road	0.08	
(f) Landscaping	0.50	
(g) Rain water harvesting structures	1.26	Unit of Measurement is linear length in km. Payment shall be made on pro rata basis on completion of a stage in a length of not less than 10% (ten percent) of the total length
(h) Approach to wayside amenities & toilet block	2.60	Payment shall be made on pro-rata basis on completed works / facilities.
(i) Providing Ambulance	0.09	on Supply of Ambulance

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Stage of Payment	Weightage	Payment procedure
(j) River/Nala Trainee and diversion works	0.17	Payment shall be made on pro-rata basis on completed works.
(k) Chequered tiles at Parking of vehicles on underpass	0.03	Payment shall be made on pro-rata basis on completed works.

2. Procedure for payment for Maintenance

2.1. The cost for maintenance shall be as started in Clause 14.1.1.

2.2. Payment for Maintenance shall be made in quarterly installments in accordance with the provisions of Clause 19.7.

SCHEDULE-I

(See Clauses 10.2.4)

DRAWINGS

1. Drawings

In compliance of the obligations set forth in Clause 10.2 of this Agreement; the Contractor shall furnish to the Authority's Engineer; free of cost; all Drawings listed in Annex-I of this Schedule-I.

2. Additional drawings

If the Authority's Engineer determines that for discharging its duties and functions under this Agreement; it requires any drawings other than those listed in Annex-I; it may by notice require the Contractor to prepare and furnish such drawings forthwith. Upon receiving a requisition to this effect; the Contractor shall promptly prepare and furnish such drawings to the Authority Engineer; as if such drawings formed part of Annex-I of this Schedule-I.

Annex - I
(SCHEDULE-I)

List of Drawings

1. The Project Expressway drawings; as defined in Clause 1.1; Definitions; Article 1; Definitions and Interpretation; Part-I: Preliminary; of the Contract Agreement shall consist:

   (a) Working Drawings of all the components/elements of the Project Expressway as determined by Authority Engineer/UPEIDA; and

   (b) As-built drawings for the Project Expressway components/elements as determined by AE/UPEIDA. As-built drawings shall be duly certified by Authority Engineer.

2. A broad list of the drawings of the various components/elements of the Project Expressway; service road and project facilities required to be submitted by the Contractor is given below:

   (a) Drawings of horizontal alignment; vertical profile and cross sections

   (b) Drawings of cross drainage works including major and minor bridges and culverts etc.

   (c) Drawings of interchanges; major intersections; grade separators; underpasses and ROB's

   (d) Drawings of toll plaza layout; toll collection systems and roadway near toll plaza

   (e) Drawings of Control Centre

   (f) Drawings of bus-bay and bus shelters with furniture and drainage system

   (g) Drawing of a truck parking lay bye with furniture and drainage system

   (h) Drawings of road furniture items including traffic signage; markings; safety barriers; etc.

   (i) Drawings of traffic diversion plans and traffic control measures

   (j) Drawings of road drainage measures

   (k) Drawings of typical details slope protection measures

   (l) Drawings of landscaping and horticulture

   (m) Drawings of vehicular and pedestrian crossings

   (n) Drawings of street lighting

   (o) Layout/Configuration of ATMS – Not Applicable

   (p) General arrangement of Base camp and Administrative Block

   (q) Drawings of Wayside Amenities area and toilet Block – Not applicable.

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SCHEDULE-J

(See Clauses 10.3.2)

PROJECT COMPLETION SCHEDULE

1. Project Completion Schedule

During Construction Period; the Contractor shall comply with the requirements set forth in this Schedule-J for each of the Project Milestones and the Scheduled Project Completion Date (the "**Project Completion Schedule**"). Within 15 (fifteen) days of the date of each Project Milestone; the Contractor shall notify the Authority of such compliance along with necessary particulars thereof.

2. Project Milestone-I

3.1. Project Milestone-I shall occur on the date falling on the 220th (Two hundred and twentieth) day from the Appointed Date (the "Project Milestone-I").

3.2. Prior to the occurrence of Project Milestone-I; the Contractor shall have commenced construction of Project Expressway including all major/minor bridges and roadworks and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 10% (Ten per cent) of the Contract Price.

3. Project Milestone-II

4.1. Project Milestone-II shall occur on the date falling on the 550th (Five hundred and fiftieth) day from the Appointed Date (the "Project Milestone-II").

4.2. Prior to the occurrence of Project Milestone-II; the Contractor shall have continued with construction of the Project Expressway including major and minor bridges and commenced the construction of elevated structures & retaining walls and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 35% (Thirty five per cent) of the Contract Price. Provided that the Stage Payment Statements of 35% shall include proportionate physical progress for road works and major/minor bridges.

4. Project Milestone-III

5.1. Project Milestone-III shall occur on the date falling on the 765th (Seven hundred and sixty fifth) day from the Appointed Date (the "Project Milestone-III").

5.2. Prior to the occurrence of Project Milestone-III; the Contractor shall have continued with construction of the Project Expressway including major and minor bridges and continued the construction of elevated structures & retaining walls and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 65% (Sixty five per cent) of the Contract Price. Provided that the Stage Payment

Statements of 65% shall include proportionate physical progress for road works and major/minor bridges.

5. Scheduled Project Completion Date

6.1. The Scheduled Project Completion Date shall occur on the 1095th (One thousand ninety fifth) day from the Appointed Date.

6.2. On or before the Scheduled Project Completion Date; the Contractor shall have completed construction in accordance with this Agreement.

6. Extension of period

Upon extension of any or all of the aforesaid Project Milestones or the Scheduled Project Completion Date; as the case may be; under and in accordance with the provisions of this Agreement; the Project Completion Schedule shall be deemed to have been amended accordingly.

SCHEDULE-K

(See Clauses 12.1.2)

TESTS ON COMPLETION

1. Schedule for Tests

1.1. The Contractor shall; no later than 30 (thirty) days prior to the likely completion of Construction of Project Expressway; notify the Authority Engineer and the Authority of its intent to subject the Project Expressway to Tests; and no later than 7 (seven) days prior to the actual date of Tests; furnish to the Authority Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Project Expressway.

1.2. The Contractor shall notify the Authority's Engineer of its readiness to subject the Project Expressway to Tests at any time after 10 (ten) days from the date of such notice; and upon receipt of such notice; the Authority's Engineer shall; in consultation with the Contractor; determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority's Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule-K.

2. Tests

2.1. Visual and physical Test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include Cross Section; Depth of pavement; Density; Bitumen content; gradation etc.

2.2. Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a laser profilometer and the maximum permissible roughness for purposes of this Test shall be 1800 (One thousand eight hundred) mm for each kilometre.

2.3. Tests for bridges: All major and minor bridges shall be subjected to the rebound hammer and ultrasonic pulse velocity tests; to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on Nondestructive Testing Techniques; at two spots in one span per structure; to be chosen at random by the Authority's Engineer. Bridges with a span of 15 (fifteen) metres or more shall also be subjected to load testing.

2.4. Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests; in accordance with Good Industry Practice; for determining the compliance of the Project Expressway with Specifications and Standards.

2.5. Environmental audit: The Authority's Engineer shall carry out a check to determine conformity of the Project Expressway with the environmental requirements set forth in Applicable Laws and Applicable Permits.

2.6. Safety Audit: The Authority's Engineer shall carry out; or cause to be carried out; a safety audit to determine conformity of the Project Expressway with the safety requirements and Good Industry Practice.

3. Agency for conducting Tests

All Tests set forth in this Schedule-K shall be conducted by the Authority's Engineer or such other agency or person as it may specify in consultation with the Authority.

4. Completion Certificate

Upon successful completion of Tests; the Authority's Engineer shall issue the Completion Certificate in accordance with the provisions of Article 12.

SCHEDULE-L

(See Clauses 12.2 and 12.4)

PROVISIONAL CERTIFICATE

1. I; ..... (Name of the Authority's Engineer); acting as the Authority's Engineer; under and in accordance with the Agreement dated ..... (the "Agreement"); for construction of the ..... (the "Project Expressway") on Engineering; Procurement and Construction (EPC) basis through ..... (Name of Contractor); hereby certify that the Tests in accordance with Article 12 of the Agreement have been undertaken to determine compliance of the Project Expressway with the provisions of the Agreement.

2. Works that are incomplete on account of Time Extension have been specified in the Punch List appended hereto; and the Contractor has agreed and accepted that it shall complete all such works in the time and manner set forth in the Agreement. In addition; certain minor works are incomplete and these are not likely to cause material inconvenience to the Users of the Project Expressway or affect their safety. The Contractor has agreed and accepted that as a condition of this Provisional Certificate; it shall complete such minor works within 30 (thirty) days hereof. These minor works have also been specified in the aforesaid Punch List.

3. In view of the foregoing; I am satisfied that the Project Expressway from km ** to km ** can be safely and reliably placed in service of the Users thereof; and in terms of the Agreement; the Project Expressway is hereby provisionally declared fit for entry into operation on this the ..... day of ..... 20.....

ACCEPTED; SIGNED; SEALED AND DELIVERED For and on behalf of CONTRACTOR by:	SIGNED; SEALED AND DELIVERED For and on behalf of AUTHORITY's ENGINEER by:
(Signature)	(Signature)

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COMPLETION CERTIFICATE

1. I; ..... (Name of the Authority's Engineer); acting as the Authority's Engineer; under and in accordance with the Agreement dated ..... (the "Agreement"); for construction of the ..... (the "Project Expressway") on Engineering; Procurement and Construction (EPC) basis through ..... (Name of Contractor); hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project Expressway with the provisions of the Agreement; and I am satisfied that the Project Expressway can be safely and reliably placed in service of the Users thereof.

2. It is certified that; in terms of the aforesaid Agreement; all works forming part of Project Expressway have been completed; and the Project Expressway is hereby declared fit for entry into operation on this the ..... day of .....20.....

SIGNED; SEALED AND AND DELIVERED
For and on behalf of
AUTHORITY's ENGINEER by:

(Signature)
(Name)
(Designation)
(Address)

SCHEDULE-M

(See Clauses 14.6; 15.2 and 19.7)

PAYMENT REDUCTION FOR NON-COMPLIANCE

1. Payment reduction for non-compliance with the Maintenance Requirements

1.1. Monthly lump sum payments for maintenance shall be reduced in the case of non-compliance with the Maintenance Requirements set forth in Schedule-E.

1.2. Any deduction made on account of non-compliance with the Maintenance Requirements shall not be paid even after compliance subsequently. The deductions shall continue to be made every month until compliance is done.

1.3. The Authority's Engineer shall calculate the amount of payment reduction on the basis of weightage in percentage assigned to non-conforming items as given in Paragraph 2.

2. Percentage reductions in lump sum payments

2.1. The following percentages shall govern the payment reduction:

S. No.	Item/Defect/Deficiency	Percentage
(a)	Carriageway/Pavement	
(i)	Potholes; cracks; other surface defects	15%
(ii)	Repairs of Edges; Rutting	5%
(b)	Road; Embankment; Cuttings; Shoulders	
(i)	Edge drop; inadequate cross-fall; undulations; settlement; potholes; ponding; obstructions	10%
(ii)	Deficient slopes; rain cuts; disturbed pitching; vegetation growth; pruning of trees	5%
(c)	Bridges and Culverts	
(i)	De-silting; cleaning. Vegetation growth; damaged pitching; flooring; parapets; wearing course; footpaths; any damage to foundations	15%
(ii)	Any Defects in superstructures; bearings and sub-structures	10%
(iii)	Painting; repairs/replacement kerbs; railings; parapets; guideposts/crash barriers; barbed wire fencing.	5%
(d)	Roadside Drains	
(i)	Cleaning and repair of drains	5%
(e)	Road Furniture	
(i)	Cleaning; painting; replacement of road signs; delineators; road markings; 200 m/km/5th km stones	5%
(f)	Miscellaneous Items	
(i)	Removal of dead animals; broken down/accidented vehicles; fallen trees; road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	Defects in Other Project Facilities	5%
(h)	Non – availability/Sub standard service of Ambulance	5%

2.2. The amount to be deducted from monthly lump-sum payment for non-compliance of particular item shall be calculated as under:

R=P/100 x M x L1/L

Where P = Percentage of particular item/Defect/deficiency for deduction

M = Monthly lump-sum payment in accordance with the Bid

L1 = Non-complying length

L = Total length of the road;

R = Reduction (the amount to be deducted for non compliance for a particular item/Defect/deficiency

The total amount of reduction shall be arrived at by summation of reductions for such items/Defects/deficiency or non compliance.

For any Defect in a part of one kilometer; the non-conforming length shall be taken as one kilometer.

SCHEDULE-N

(See Clauses 18.1.1)

SELECTION OF AUTHORITY'S ENGINEER

1. Selection of Authority's Engineer

1.1. The provisions of the Model Request for Proposal for Selection of Technical Consultants; issued by the Ministry of Finance in May 2009; or any substitute thereof shall apply for selection of an experienced firm to discharge the functions and duties of an Authority's Engineer.

1.2. In the event of termination of the Technical Consultants appointed in accordance with the provisions of Paragraph 1.1; the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule-N.

2. Terms of Reference

The Terms of Reference for the Authority's Engineer (the "TOR") shall substantially conform with Annex 1 to this Schedule-N.

3. Appointment of Government entity as Authority's Engineer

Notwithstanding anything to the contrary contained in this Schedule; the Authority may in its discretion appoint a government-owned entity as the Authority's Engineer; provided that such entity shall be a body corporate having as one of its primary functions the provision of consulting; advisory and supervisory services for engineering projects; provided further that a government-owned entity which is owned or controlled by the Authority shall not be eligible for appointment as Authority's Engineer.

Annex – I
(Schedule-N)

TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER

1. Scope

1.1. These Terms of Reference (the "TOR") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated ..... (the "Agreement); which has been entered into between the [name and address of the Authority] (the "Authority") and ..... (the "Contractor") for the .....; and a copy of which is annexed hereto and marked as Annex-A to form part of this TOR.

1.2. The TOR shall apply to construction and maintenance of the Project Expressway.

2. Definitions and interpretation

2.1. The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have; unless repugnant to the context; the meaning respectively assigned to them in the Agreement.

2.2. References to Articles; Clauses and Schedules in this TOR shall; except where the context otherwise requires; be deemed to be references to the Articles; Clauses and Schedules of the Agreement; and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.

2.3. The rules of interpretation stated in Clauses 1.2; 1.3 and 1.4 of the Agreement shall apply; mutatis mutandis; to this TOR.

3. General

3.1. The Authority's Engineer shall discharge its duties in a fair; impartial and efficient manner; consistent with the highest standards of professional integrity and Good Industry Practice.

3.2. The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement; but subject to obtaining prior written approval of the Authority before determining:

(a) any Time Extension;

(b) any additional cost to be paid by the Authority to the Contractor;

(c) the Termination Payment; or

(d) any other matter which is not specified in (a); (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 50,00,000 (Rs. fifty lakh).

3.3. The Authority's Engineer shall submit regular periodic reports; at least once every month; to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.

3.4. The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however; that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 18.2.

3.5. The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.

3.6. In the event of any disagreement between the Parties regarding the meaning; scope and nature of Good Industry Practice; as set forth in any provision of the Agreement; the Authority's Engineer shall specify such meaning; scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

4. Construction Period

4.1. During the Construction Period; the Authority's Engineer shall review the Drawings furnished by the Contractor along with supporting data; including the geo-technical and hydrological investigations; characteristics of materials from borrow areas and quarry sites; topographical surveys; and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1.6. The Authority's Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided; however that in case of a Major Bridge or Structure; the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular; such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

4.2. The Authority's Engineer shall review any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.

4.3. The Authority's Engineer shall review the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty-one) days stating the modifications; if any; required thereto.

4.4. The Authority's Engineer shall complete the review of the methodology proposed to be adopted by the Contractor for executing the Works; and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.

4.5. The Authority's Engineer shall grant written approval to the Contractor; where necessary; for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Expressway for purposes of maintenance during the Construction Period in accordance with the provisions of Clause 10.4.

4.6. The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.

4.7. The Authority's Engineer shall inspect the Construction Works and the Project Expressway and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular; the Authority's Engineer shall include in its Inspection Report; the compliance of the recommendations made by the Safety Consultant.

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4.8. The Authority's Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials; and such other Materials as the Authority's Engineer may require.

4.9. For determining that the Works conform to Specifications and Standards; the Authority's Engineer shall require the Contractor to carry out; or cause to be carried out; tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4.9; the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORTH (the "Quality Control Manuals") or any modification/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

4.10. The Authority's Engineer shall test check at least 20 (twenty) percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.

4.11. The timing of tests referred to in Paragraph 4.9; and the criteria for acceptance/ rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to; and independent of; the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

4.12. In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works; the Authority's Engineer shall require the Contractor to carry out remedial measures.

4.13. The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Expressway; whether because of an accident; unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event; the provisions of Clause 21.6 shall apply.

4.14. In the event that the Contractor fails to achieve any of the Project Milestones; the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays; if any. If the Authority's Engineer shall determine that completion of the Project Expressway is not feasible within the time specified in the Agreement; it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress; and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor; the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.

4.15. The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.4.

4.16. Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure; the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.

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4.17. In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users; and requires the Authority's Engineer to inspect such works; the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice; and make a report to the Authority forthwith; recommending whether or not such suspension may be revoked by the Authority.

4.18. The Authority's Engineer shall carry out; or cause to be carried out; all the Tests specified in Schedule-K and issue a Completion Certificate or Provisional Certificate; as the case may be. For carrying out its functions under this Paragraph 4.18 and all matters incidental thereto; the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K.

5. Maintenance Period

5.1. The Authority's Engineer shall aid and advise the Contractor in the preparation of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with the Contractor.

5.2. The Authority's Engineer shall undertake regular inspections; at least once every month; to evaluate compliance with the Maintenance Requirements and submit a Maintenance Inspection Report to the Authority and the Contractor.

5.3. The Authority's Engineer shall specify the tests; if any; that the Contractor shall carry out; or cause to be carried out; for the purpose of determining that the Project Expressway is in conformity with the Maintenance Requirements. It shall monitor and review the results of such tests and the remedial measures; if any; taken by the Contractor in this behalf.

5.4. In respect of any defect or deficiency referred to in Paragraph 3 of Schedule-E; the Authority's Engineer shall; in conformity with Good Industry Practice; specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissible limit.

5.5. The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Expressway for undertaking maintenance/repair thereof; and shall grant permission with such modifications; as it may deem necessary; within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure; the Authority's Engineer shall monitor the reopening of such lane(s); and in case of delay; determine the Damages payable by the Contractor to the Authority under Clause 14.5.

6. Determination of costs and time

6.1. The Authority's Engineer shall determine the costs; and/or their reasonableness; that are required to be determined by it under the Agreement.

6.2. The Authority's Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.

6.3. The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 18.5.

Uttar Pradesh Expressways Industrial Development Authority UPEIDA LUCKNOW

Gawar Const. Ltd. HISAR DSS-378, Sec. 16-17

7. Payments

7.1. The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provisions of Clause 10.2.4 (d).

7.2. Authority's Engineer shall:

(a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4; determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment; pending issue of the Interim Payment Certificate; and

(b) within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4; deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor; after adjustments in accordance with the provisions of clause 19.10.

7.3. The Authority's Engineer shall; within 15 (fifteen) days of receipt of the Monthly Maintenance Statement from the Contractor pursuant to Clause 19.6; verify the Contractor's monthly statement and certify the amount to be paid to the Contractor in accordance with the provisions of the Agreement.

7.4. The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provisions of Clause 19.16.

8. Other duties and functions

The Authority's Engineer shall perform all other duties and functions as specified in the Agreement.

9. Miscellaneous

9.1. A copy of all communications; comments; instructions; Drawings or Documents sent by the Authority's Engineer to the Contractor pursuant to this TOR; and a copy of all the test results with comments of the Authority's Engineer thereon; shall be furnished by the Authority's Engineer to the Authority forthwith.

9.2. The Authority's Engineer shall retain at least one copy each of all Drawings and Documents received by it; including 'as-built' Drawings; and keep them in its safe custody.

9.3. Within 90 (ninety) days of the Project Completion Date; the Authority's Engineer shall obtain a complete set of as-built Drawings; in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority; reflecting the Project Expressway as actually designed; engineered and constructed; including an as-built survey illustrating the layout of the Project Expressway and setback lines; if any; of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.

9.4. The Authority's Engineer; if called upon by the Authority or the Contractor or both; shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between the Parties.

9.5. The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

SCHEDULE-O

(See Clauses 19.4.1; 19.6.1; and 19.8.1)

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

a) the estimated amount for the Works executed in accordance with Clause 19.3.1 subsequent to the last claim;

b) amounts reflecting adjustments in price for the aforesaid claim;

c) the estimated amount of each Change of Scope Order executed subsequent to the last claim;

d) amounts reflecting adjustment in price; if any; for (c) above in accordance with the provisions of Clause 13.2.3 (a);

e) total of (a); (b); (c) and (d) above;

f) Deductions:

(i) Any amount to be deducted in accordance with the provisions of the Agreement except taxes;

(ii) Any amount towards deduction of taxes; and

(iii) Total of (i) and (ii) above.

g) Net claim: (e) – (f) (iii);

h) The amounts received by the Contractor upto the last claim:

(i) For the Works executed (excluding Change of Scope orders);

(ii) For Change of Scope Orders; and

(iii) Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

a) the monthly payment admissible in accordance with the provisions of the Agreement;

b) the deductions for maintenance work not done;

c) net payment for maintenance due; (a) minus (b);

d) amounts reflecting adjustments in price under Clause 19.12; and

e) amount towards deduction of taxes

3. Contractor's claim for Damages

Note: The Contractor shall submit its claims in a form acceptable to the Authority.

Uttar Pradesh Expressways Industrial Development Authority UPEIDA LUCKNOW

Gawar Const. Ltd. HISAR DSS-378, Sec.16-17

SCHEDULE-P

(See Clauses 20.1)

INSURANCE

1. Insurance during Construction Period

1.1. The Contractor shall effect and maintain at its own cost; from the Appointed Date till the date of issue of the Completion Certificate; the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure; malicious act; accidental damage; explosion; fire and terrorism:

a) insurance of Works; Plant and Materials and an additional sum of [15 (fifteen)] per cent of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and

b) insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor; for a sum sufficient to provide for their replacement at the Site.

1.2. The insurance under paragraph 1.1 (a) and (b) above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2. Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage to property

3.1. The Contractor shall insure against its liability for any loss; damage; death or bodily injury; or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9); which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences. The insurance cover shall be not less than: **Rs. 1396.00 Crores**

3.2. The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:

a) the Authority's right to have the construction works executed on; over; under; in or through any land; and to occupy this land for the Works; and

b) damage which is an unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in joint names

The insurance under paragraphs 1 to 3 above shall be in the joint names of the Contractor and the Authority.

Annexure -5

उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड
UTTAR PRADESH POLLUTION CONTROL BOARD

सं0 / Ref. No. H20005 /C-2/NGT-684/24

दिनाँक / Date 21-11-24

पंजीकृत

सेवा में,

मैसर्स गावर कन्सट्रक्शन लिमिटेड,
एस0एफ0-1, जे0एम0डी0 गलेरिया, सेक्टर-48, सोहना रोड, गुरूगॉव
जनपद-झांसी।

यह कि **मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस0एफ0-1, जे0एम0डी0 गलेरिया, सेक्टर-48, सोहना रोड, गुरूगॉव** जिसे आगे परियोजना कहा जायेगा तथा जिसके द्वारा वायु (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1981 की धारा 21 के अर्न्तगत राज्य बोर्ड से पूर्व सहमति प्राप्त किया जाना अनिवार्य है।

यह कि परियोजना मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली संख्या 556/2024 (अरूण तिवारी बनाम उत्तर प्रदेश) में आच्छादित परियोजना मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस0एफ0-1, जे0एम0डी0 गलेरिया, सेक्टर-48, सोहना रोड, गुरूगॉव के सम्बन्ध में केन्द्रीय प्रदूषण नियंत्रण बोर्ड के पत्रांक CM-13011/10/2024-LAW-HO-CPCB-HO/5802 दिनांक 28.10.2020 द्वारा राज्य बोर्ड को वायु (प्रदूषण निवारण तथा नियंत्रण) अधिनियम, 1981 की धारा 18(1)(बी) के अन्तर्गत निम्न निर्देश जारी किये गये है:-

ii. to initiate actions immediately for appropriate punitive action as applicable under the law, including levying and realization of environmental compensation, for violation of provisions of environmental laws as mentioned in abonve paragraphs, after duly following the principle of natural justice;

यह कि क्षेत्रीय कार्यालय के पत्र संख्या 555/ओ0ए0-556/2023/2024-25 दिनांक 14.11.2024 के अनुसार खान अधिकारी, जनपद-जालौन के पत्रांक 1904/एम0एम0सी0-30 दिनांक 16.11.2024 में उल्लेखित है कि प्रश्नगत प्रकरण बुन्देलखण्ड एक्सप्रेस-वे निर्माण कार्य के लिये जिन स्थानो से मिटटी का खनन कार्य किया गया है, उक्त प्रकरण वर्ष 2020 से 2022 तक समयावधि का है। तत्सम्बन्धी पत्र दिनांकित 16.11.2024 की प्रति संलग्न है। कार्यालय अभिलेखानुसार बुन्देलखण्ड एक्सप्रेस वे निर्माण हेतु यू0पी0ई0आई0डी0ए0 एवं मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस0एफ0-1, जे0एम0डी0 गलेरिया, सेक्टर-48, सोहना रोड, गुरूगॉव के मध्य दिनांक 15.01.2020 को अनुबंध किया गया है, पत्र की छायाप्रति संलग्न है। इस प्रकार उक्त वर्णित पत्र दिनांक 16.11.2024 एवं अनुबंध पत्र दिनांक 15.01.2020 के माध्यम से मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस0एफ0-1, जे0एम0डी0 गलेरिया, सेक्टर-48, सोहना रोड, गुरूगॉव द्वारा बुन्देलखण्ड एक्सप्रेस-वे निर्माण हेतु दिनांक 15.01.2020 से दिनांक 31.12.2022 की अवधि के मध्य अवैध मिट्टी खनन किये जाने का तथ्य प्रकाश में आया है। अवैध मिट्टी खनन किये जाने के फलस्वरूप पर्यावरणीय क्षति होना सम्भावित है। परियोजना द्वारा खनन कार्य हेतु राज्य बोर्ड से एक्सप्रेस-वे के निर्माण हेतु पूर्व सहमति प्राप्त नहीं किया गया है। उक्त के आलोक में क्षेत्रीय अधिकारी झांसी के पत्र दिनांक 18.11.2024 द्वारा बिना पूर्व सहमति के एक्सप्रेस-वे के निर्माण कार्य किये जाने एवं अवैध मिट्टी खनन किये जाने के दृष्टिगत मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस0एफ0-1, जे0एम0डी0 गलेरिया, सेक्टर-48, सोहना रोड, गुरूगॉव पर दिनांक 15.01.2020 से दिनांक 31.12.2022 तक की अवधि अर्थात् 1066 दिनों की डिफाल्टर अवधि सूचित की गयी है।

यह कि केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा निर्मित गाइड लाइन में पर्यावरणीय क्षतिपूर्ति की गणना हेतु निर्धारित सूत्र Penalty=PI x N x R x S x LF के अनुसार आंकलित पर्यावरणीय क्षतिपूर्ति रूपये 12,500/- प्रतिदिन आती है। जिसमें PI=Pollution Index)=50, R (Penalty in Rs)= 250, S (Factor for scale of operation, Medium)=1.0, LF (Location factor)=1.0 लिया गया है।

यह कि क्षेत्रीय अधिकारी झांसी के पत्र दिनांक 18.11.2024 द्वारा परियोजना **मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस0एफ0-1, जे0एम0डी0 गलेरिया, सेक्टर-48, सोहना रोड, गुरूगॉव** के विरूद्ध उक्त वर्णित कुल 1066 दिनों की डिफाल्टर अवधि हेतु रू0 12,500/- प्रतिदिन की दर से कुल धनराशि रू0 1,33,25,000 (कुल एक करोड तैतीस लाख पच्चीस हजार मात्र) की पर्यावरणीय क्षतिपूर्ति अधिरोपित किये जाने की संस्तुति की गयी है।

अतः उपरोक्त वर्णित तथ्यों एवं क्षेत्रीय अधिकारी, झांसी की संस्तुति के दृष्टिगत सक्षम अधिकारी के अनुमोदनोपरान्त परियोजना के विरूद्ध पर्यावरणीय क्षतिपूर्ति अधिरोपित किये जाने हेतु निम्नानुसार कारण बताओ नोटिस जारी किया जाता है :-

- यह कि क्यों न परियोजना मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस0एफ0-1, जे0एम0डी0 गलेरिया, सेक्टर-48, सोहना रोड, गुरूगॉव के विरूद्ध 1066 दिवस की उल्लंघन अवधि हेतु प्रतिदिन रू0 12,500/- की दर से कुल रूपये 1,33,25,000 (कुल एक करोड तैतीस लाख पच्चीस हजार मात्र) की पर्यावरणीय क्षतिपूर्ति अधिरोपित कर दी जाये।

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उपरोक्त के संबंध में अपना स्पष्टीकरण इस पत्र प्राप्ति के 15 दिन के अन्दर बोर्ड मुख्यालय में प्रेषित करें, अन्यथा की स्थिति में इकाई के विरूद्ध उपरोक्तानुसार पर्यावरणीय क्षतिपूर्ति अधिरोपित कर दी जायेगी, जिसका सम्पूर्ण उत्तरदायित्व स्वयं इकाई एवं इकाई स्वामी का होगा।

सक्षम अधिकारी के अनुमोदनोपरान्त पत्र निर्गत।

संलग्नक–यथोपरि।

मुख्य पर्यावरण अधिकारी, (वृत्त–2)

प्रतिलिपिः–निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित–

1. जिलाधिकारी, झांसी
2. क्षेत्रीय अधिकारी, उ0प्र0 प्रदूषण नियंत्रण बोर्ड, झांसी को इस निर्देश के साथ प्रेषित कि अपने स्तर से भी कारण बताओ नोटिस की प्रति परियोजना स्वामी को प्राप्त कराते हुए, पावती एवं जारी कारण बताओ नोटिस के संबंध में परियोजना का अद्यतन निरीक्षण कर आख्या 15 दिन के अन्दर बोर्ड मुख्यालय प्रेषित करना सुनिश्चित करें।

Atulesh Jain
मुख्य पर्यावरण अधिकारी, (वृत्त–2)

Annexure -6

Report of the CPCB In-house Committee on Methodology for Assessing Environmental Compensation and Action Plan to Utilize the Fund

CENTRAL POLLUTION CONTROL BOARD
"Parivesh Bhawan", East Arjun Nagar,
Delhi-110032

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Annexure-VI

CRITERIA TO CALCULATE WATER CONSUMPTION

Table 1: Discharge of 4" Dia and 1 HP Pump

Sl. No.	Depth (Meter)	Discharge	
		LPM	m^3/hr
1	25	50	3
2	43	40	2.4
3	59	30	1.8
4	69	20	1.2
5	77	10	0.6

Table 2: Discharge of 4" Dia and 2 HP Pump

Sl. No.	Depth (Meter)	Discharge	
		LPM	m^3/hr
1	60	50	3
2	98	40	2.4
3	124	30	1.8
4	141	20	1.2
5	165	10	0.6

Table 3: Discharge of 6" Dia and 3 HP Pump

Sl. No.	Depth (Meter)	Discharge	
		LPM	m^3/hr
1	17	200	12
2	29	175	10.5
3	41	150	9
4	50	130	7.8
5	62	100	6

Table 4: Discharge of 6" Dia and 5 HP Pump

Sl. No.	Depth (Meter)	Discharge	
		LPM	m^3/hr
1	26	225	13.5
2	50	200	12
3	70	175	10.5
4	86	150	9
5	92	140	8.4

law. All the matters relating to illegal extraction of ground water by individuals are disposed of with these directions.

33. The Expert Committee report, the new policy and challenge to orders of authorities, if any, will be considered on the next date.

The matter be put up for above consideration in the first week of May, 2019.

Adarsh Kumar Goel, CP

S.P. Wangdi, JM

K. Ramakrishnan, JM

Dr. Nagin Nanda, EM

January 03, 2019
Original Application No. 176/2015
(M.A. No. 1332/2015) and other connected matters
AK

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appropriate mechanism can be introduced consistent with the needs of environment.

29. The MoEF&CC is directed to constitute an Expert Committee by including representatives from IIT Delhi, IIT Roorkee, IIM Ahmedabad, CPCB, NITI Ayog and any other concerned agency or department to examine the issue of appropriate policy for conservation of ground water with a robust institutional mechanism for surveillance and monitoring with a view to enhance access to ground water for drinking purposes in OCS areas by way of appropriate replenishment practices which can be properly accounted and measured for as well as to sustain the floodplains of rivers in terms of e-flows and other water bodies. The MoEF & CC and MoWR may finalize the issue of subject remain *inter-se* with regard to ground water reserve and its quality.

30. The Committee may be constituted in two weeks and report of the Committee may be furnished to the MoEF &CC and this Tribunal in two months by e-mail at ngt.filing@gmail.com.

31. The Committee may also indicate the projection of its impact study in light of projected data for the next 50 years (in phased manner with action plan for each decade). Thereafter, fresh guidelines be issued by the concerned Ministry and the report furnished to the Tribunal on or before 30.04.2019.

32. The CPCB may constitute a mechanism to deal with individual cases of violations of norms, as existed prior to Notification of 12.12.2018, to determine the environment compensation to be recovered or other coercive measures to be taken, including prosecution, for past illegal extraction of ground water, as per

Versus

Union of India & Ors. Respondent(s)

With
Shailesh Singh Applicant(s)

Versus
Hotel The Oberoi Amarvilas & Ors. Respondent(s)
With
Shailesh Singh Applicant(s)

Versus
Panchsheel Buildtech Pvt. Ltd. & Ors. Respondent(s)
With
Shailesh Singh Applicant(s)

Versus
Central Ground Water Board & Ors. Respondent(s)
With
M/s A-One Mineral Water Industry Applicant(s)

Versus
Central Ground Water Authority & Ors. Respondent(s)
With
Mohd. Javed Asghar Applicant(s)

Versus
M/s Upper Ganges Sugar and Industries Ltd. (Distillery Unit) & Ors. Respondent(s)
With
Mohd. Javed Asghar Applicant(s)

Versus
State of U.P. & Ors. Respondent(s)

Hearing concluded on: 18.12.2018
Order uploaded on: 03.01.2019

CORAM: **HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON**
HON'BLE MR. JUSTICE S.P. WANGDI, JUDICIAL MEMBER
HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

For Applicant(s): Mr. Raj Pajwani, Senior Advocate and Mr. Rahul Choudhary, Advocate (In O.A. Nos. 59/2012 & 108/2013)
Ms. Preeti Singh, Mr. S. Porwal, Mr. Shivam Jaiswal, Advocates (In O.A. Nos. 176/2015, 484/2015, 327/2018 & 115/2017)
Mr. Amrendra Kumar Dubey, Advocate (O.A. No. 411/2018

For Respondent (s): Ms. Sakshi Popli, Advocate for DJB (O.A. No. 59/2012)
Mr. Sumeet Pushkarna, Mr. Devanshu, Advocates with Mr. Sudhir Chauhan, E.E., Delhi Jal Board (O.A. No. 108/2013)
Mr. Ajay Jain, Advocate for GNCTD
Mr. Ardhendumauli Kumar Prasad, Mr. Shashank Saxena, Ms. Diksha Gera, Mr. Amritesh Raj, Advocates for CGWA
Mr. Pradeep Mishra, Mr. Daleep Dhyani, Advocates for UPPCB
Ms. Sakshi Popli, Advocate for NDMC
Mr. Amit Tiwari, Mr. Rohit Pratap Singh, Advocates for State of UP

Annexure-V

Item Nos. 1 to 11 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 176/2015
(M.A. No. 1332/2015)
&
Original Application No. 59/2012
(M.A. No. 34/2016 & M.A. No. 190/2016)
&
Original Application No. 108/2013
(M.A. No. 489/2015)
&
Original Application No. 179/2013
(M.A. No. 866/2014 & M.A. NO. 644/2015)
&
Appeal No. 67/2015
(M.A. No. 652/2015)
And

Original Application No. 484/2015
(M.A. No. 155/2017, M.A. No. 567/2017
& M.A. No. 927/2017)
And
Original Application No. 327/2018
(M. A. No. 1282/2018)
And
Original Application No. 115/2017
(M.A. No. 442/2017)
And
Original Application No. 411 of 2018
And
Original Application No. 613/2017
And
Original Application No. 614/2017

Shailesh Singh Respondent(s)
Versus
Hotel Holiday Regency, Moradabad & Ors. Applicant(s)
With

Legal Aid, National Green Tribunal Bar Association
Applicant(s)
Versus
NCT of Delhi & Ors. Respondent(s)
With
Raj Hans Bansal Applicant(s)
Versus
Ministry of Water Resources & Ors. Respondent(s)
With
Apex Chambers of Commerce and
Industries of N.C.T. of Delhi & Ors. Applicant(s)
Versus
Govt. of NCT Delhi & Ors. Respondent(s)
With
Vikrant Tongad Applicant(s)

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their performance should be recorded and considered favourably or otherwise for their career progression.

xv. Similar exercise as (xiv) may be undertaken to identify officers responsible for failure in the past. Such exercise may be completed within three months from today.

xvi. Since failure of preventing the pollutants being discharged in water bodies (including lakes) and failure to implement solid and other waste management rules are too frequent and widespread, the CPCB must lay down specific guidelines to deal with the same, throughout India, including the scale of compensation to be recovered from different individuals/authorities, in addition to or as alternative to prosecution. The scale may have slabs, depending on extent of pollution caused, economic viability, etc. Deterrent effect for repeated wrongs may also be provided.

xvii. MoEF&CC may specify limit for phosphorus in soaps and detergents to prevent damage to the environment and public health.

27. The above amount in the present case has been determined having regard to the estimated cost of setting up of STPs, based on the data available, which has been assessed with the assistance of the learned Counsel for the parties.

28. We have nominated Justice Santosh Hegde on information being provided during the hearing that he is agreeable to undertake the above job.

29. Justice Hegde will be entitled to a token honorarium of Rs. 2.5 Lakh per month from the date he assumes the charge. Justice Hegde will be entitled to assistance of persons of his choice for which remuneration will be paid by the SPCB, Karnataka as may be determined by Justice Hegde.

Annexure-IV

Item Nos. 01 & 02 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 125/2017
(M.A. No. 1337/2018)
With
Original Application No. 217/2017
(M.A. Nos. 761/2017, 1073/2017,
1098/2017 & 1471/2017)

Court on its own Motion — Applicant(s)
Versus
State of Karnataka — Respondent(s)

With

D. Kupendra Reddy — Applicant(s)
Versus
State of Karnataka — Respondent(s)

Date of hearing: 06.12.2018

CORAM: **HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON**
HON'BLE MR. JUSTICE S.P. WANGDI, JUDICIAL MEMBER
HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

Original Application No. 125/2017
(M.A. No. 1337/2018)

For Applicant(s): Mr. Sajan Poovayya, Sr. Advocate and Mr. Saransh Jain, Advocate for impleaded applicant – Namma Bengluru Foundation
Mr. Vikram Hegde, Advocate for impleaded applicant

For Respondents (s): Mr. Devraj Ashok, Advocate
Mr. Rajkumar, Advocate and Ms. Sonia, LA
Ms. Nidhi Mehrotra, Advocate

Original Application No. 217/2017
(M.A. Nos. 761/2017, 1073/2017,
1098/2017 & 1471/2017)

For Applicant(s): Ms. Guneet Khehar, Mr. Tarunvir Singh Khehar, Mr. P. Ramaprakash and Mr. Sandeep Mishra, Advocates

For Respondents (s): Dr. Abhishek Atrey, Advocate
Mr. Rajkumar, Advocate and Ms. Sonia, LA

ORDER

1. The issue for consideration in the two matters, one initiated by the Tribunal on its own motion and the other filed by an individual relates to contamination of water bodies at Bengaluru - Bellandur lake, Agara lake and Varthur lake *inter-alia*, on account of discharge of untreated sewage and other effluents from

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S. No.	Item		Comments of CSE	Comments of IEG	Committee's Deliberations
7	GRAP	-	-	Size of the construction sites more than 20,000 sqm. area are considered for EC. Although, small sites cumulatively impact significantly. Illegal dumping of municipal solid waste regardless of the place should be penalized.	As per the EIA Notification, 2006, building construction projects more than 20,000 sqm. area are required to have environmental clearance, therefore, the same cut-off is maintained here. Issue of illegal dumping of municipal solid waste is being covered in separate report of EC.
8	Others: (a)	Severity of violations should be measured in terms of hours of violation because for some pollutants even a few hours of violation can have serious environmental and health consequences. This would require continuous monitoring of stacks, which is not the case presently for most units. Therefore, continuous monitoring should be implemented urgently, to begin with for all red and orange categories.	-	-	Currently, online continuous effluent/emission monitoring system (OCEMS) is installed in only in 17 categories of highly polluting industries and some other industrial sectors. Further, in current practice the compliance of industries is only verified by physical monitoring and compensation may be imposed based on the manual testing. The idea of measurement of violation on hourly basis may be considered in future, when OCEMS is widely installed and included in policy.
	(b)	CETP should be categorized under Red Category of industries. Some sub-classification should be undertaken under red categories of industries.	-	-	CETPs are already categorized under Red Category of Industries
	(c)	Based on the spirit behind the proposed charge, it should therefore be called an "environmental penalty" rather than "environmental compensation".	-	-	The power of imposing "Penalty" lies in the jurisdiction of the Hon'ble Courts and NGT only. The CPCB is empowered to levy environmental compensation by the Hon'ble NGT in its order dated 03.08.2018 (OA No.593/2017). Therefore, term "Environmental Penalty" is avoidable.

S. No.	Item		Comments of CSE	Comments of IEG	Committee's Deliberations
4	S-factor	Classification of industries should be based on profit/ turnover basis.	S-factor should be based on the turn-over of the industrial unit.	-	Presently industrial units are classified into small, medium and large category (MSME Act, 2006) based on the data of assets/infrastructure available with them. The data for **profit**/turnover of industrial units are not available with SPCBs/PCCs and S-factor based on **profit**/turnover will complicate the procedure for calculation of EC. This may be considered in future when SPCBs/PCCs will have such type of data.
5	Level of non-compliance	Pollution Index does not measure the level of pollution. Further, averaging PI eliminates the variation in the nature/ impact of pollution that PI tries to capture. Further, the Red Category itself is too wide and some sort of sub-classification should be undertaken The rate of the penalty should increase with the period of violation. The penalty should increase exponentially in case of repeated violations. The objective should be that units should choose to shut down operations when violations cannot be brought under control in the specified time.	For different level of non-compliance such as gross, moderate and low, a factor for 'intensity of violation', IV-factor should be incorporated in the formula.	-	Pollution Index (PI) itself covers the potential of environmental pollution as its calculation considers variation in pollution load. The industrial sectors have been categorized into Red, Orange and Green, based on their Pollution Index in the range of 60 to 100, 41 to 59 and 21 to 40, respectively. As PI is not available for all the industrial sectors, calculating PI for rest of the sectors will delay the processing. Therefore, for calculating the Environmental Compensation average PI as 80, 50 and 30 may be used for Red, Orange and Green category of industries, respectively. To keep the formula simple for better implementation, the IV factor may not be considered as there are different environmental parameters such as environmental standards and for each standard calculation of level of violation and its weightage will be a tedious task, which may bring difficulty in implementation of EC concept. The Committee has agreed that in order to include deterrent effect for repeated violations, EC may be increased on exponential basis, i.e. by 2, 4 and 8 times on each similar violation. Further, if the violator continues its operations beyond 3 months then EC may be increased by 2, 4 and 8 times for 2nd, 3rd and 4th quarter, respectively. Besides EC, industry may be prosecuted or closure directions may be issued, whenever required. EC is not a substitute for taking actions under EP Act, Water Act or Air Act. In fact, units found polluting should be closed/prosecuted as per the Acts.
6	Utilization of fund	Funds may be utilized for building monitoring and enforcement capacity of SPCBs and strengthening the pollution compliance especially in the MSME sector.	-	Incentives to regulators where no violations are observed and incentives to public for reporting violations may be provided.	Scheme of infrastructure augmentation of Urban Local Bodies (ULBs) /capacity building of SPCBs/PCCs is already covered in the report Further, schemes such as incentives to regulators where no violations are observed and incentives to public for reporting violations may be considered separately.

Comments Received from Various Expert Institutions on the Report on Environmental Compensation

As per the Hon'ble NGT suggestion, CPCB has invited comments of 3 expert institution, namely, Centre for Science and Environment (CSE), Institute of Economic Growth (IEG) and The Energy Research Institute (TERI). The CPCB in-house committee on Environmental Compensation has deliberated on the comments and finalized the report accordingly. The Committee's deliberations are summarized in table below:

S. No.	Item	Comments from TERI	Comments of CSE	Comments of IEG	Committee's Deliberations
1	Cases d, e and f	Distinction between categories "a, b, c" and "d, e, f" is not clear. Case specific investigations should be minimized. Proposed cases deals separately with intentional and accidental cases but sometimes they are not easy to establish.	-	Why cases 'e' and 'f' are left for later remediation and study?	There may be a varied damage to the environment as considered in cases 'e' and 'f'. Such damage assessment requires detailed case specific study and remediation measures. Therefore, whenever such case comes into the notice, Environmental Compensation may be levied based on the detailed investigation made by Expert Institutions/Organizations.
2	R-factor	-	R-factor should be Rs. 1,000/day.	Why R-factor is kept as 250, although the value ranges between 100 to 500?	In the Environmental Compensation policy, average value of the R-factor as 250 is recommended, keeping in view both its practicability as well as to make it significantly deterrent, which may be further revised in future.
3	L-factor	-	L-factor should be based on the population density of surroundings, instead of population of the nearby city/town. For critically polluted areas/ ecologically fragile areas LF should be considered as 2.	For nearby city, having population less than 1 million, the LF is 1. This implies that we care only for populated regions only. Industries located in critically polluted and ecologically fragile area should be closed down.	Population density for surrounding of industrial units will be complex because it will vary depending on area used in calculation of population density as industrial units are generally away from population. More weightage is given to the higher population exposure to the risk. In case the industry is located in the city of population less than one million than the LF Factor will be 1. Depending on the local environmental conditions, the restrictions on expansion and modernization of industries in critically polluted areas are imposed as per the prevailing policy of the Government of India. Similarly, industries in ecologically fragile areas are permitted after careful examination, as per prevailing policy of MoEFCC/SPCB, The Committee agreed that for notified ecologically fragile areas, LF may be considered as 2. However, LF for critically polluted areas may be explored in future.

			Thus, the functional fabric of CPCB shall remain intact.			
9	Others	Higher EC for non-installation of pollution control measures. Expected sources should have different scoring methodology based on their weightage.				The committee discussed that CPCB is already taking appropriate action including closure direction against the industries found operating without pollution control measures.

S. No.	Item	RD Kolkata	RD Vadodara	RD Bengaluru	RD Lucknow	Committee Deliberations
6	**Defining period of violations for which EC will be levied**		Duration of violations needs more clarity.	For industry having OCEMS, no. of days may be counted based on the recorded data. Industry without OCEMS- based on break down of ETP/APCD, disturbance of power supply or any failure of auxiliary machineries w.r.t. control system.	May be clearly defined as the period between the day of violation observed and the day of compliance verified by CPCB/SPCB/PCC.	The committee agreed that period of violation for which EC may be levied will be the period between the day of violation observed and the day of compliance verified by CPCB/SPCB/PCC.
7	**Repeated Violations**		Some number of days may be specified after which the penalty amount may get a factor of 1.5 or 2.		Multiplying factor for repeated violations may be included. For ex. 1st Repetition- 25% 2nd Repetition- 50% 3rd Repetition- 100%	For habitual offenders, higher amount of penalty/compensation may be charged in future.
8	**Utilization of fund**	An environmental damage assessment cell may be created. Expertise in the field may be achieved by involving scientist/engineers and providing them training in country/abroad.	Amount should not be utilized for a) Industrial Inspections for compliance verification, b) Installation of Continuous water quality monitoring stations / Continuous ambient air quality monitoring stations for strengthening of existing monitoring network, c) Preparation of Comprehensive Industry Documents on Industrial Sectors / clean technology f) Funding to financially weaker municipalities for installation of STPs The amount should be utilized solely for damage assessment, remediation of affected sites, orphan contaminated sites and creating awareness. The purpose should not get inclined towards revenue generation.			RD Vadodara suggested that amount should be utilized only for remediation purpose. However, committee discussed that the proposal for utilization of fund is prepared considering the other aspects (i.e. direct and indirect) for protection of environment, which include research, monitoring etc. Suggestion of RD Kolkata may be considered in future.

Comments Received from Various RDs on Draft Report for Environmental Compensation

Annexure-II

S. No.	Item	RD Kolkata	RD Vadodara	RD Bengaluru	RD Lucknow	Committee Deliberations
1	Case- a, b & c	Bypassing of effluent/emission should be given special consideration. EC levied on ROG categories of industries should be on the basis of inspection by CPCB, complaint verification and routine inspection.	Instead of "Compensation", "Penalty" word should be used. In case common facilities like CETPs, factor may be introduced based on member industries. Clarify the applicability of penalty in addition to closure directions for pro-longed and gross non-compliance.			The Committee discussed that the points highlighted by RD Kolkata are already the part of cases fit for violation and levy environmental compensation. However, as mentioned by RD Vadodara, word "Penalty" may be used for case a, b and c. For CETPs, a factor may be considered in future based on the capacity of the plant.
2	Case- d, e & f	Higher rates for irreparable damages crop, soil, health etc. Leakages/spillage should have different compensation value.	It should be mentioned that instances d, e & f shall be dealt for environmental compensation in line with the polluter pays principle, besides of environmental penalty for cases a, b and c.	Similar to 'Guidelines on Liabilities for Environmental Damages due to Handling & Disposal of Hazardous Waste and Penalty', Guidelines may be prepared.		Suggestions made by RD Kolkata and Vadodara has already been taken care. Concept of environmental compensation is based on the philosophy of "polluters pay" and for grieve injury to environment, compensation will be charged as per the assessment of remediation cost, on case to case basis.
3	Pollution Index (PI)			Instead of average PI, Actual PI may be used.		Committee suggested that to make the implementation of EC simple and easy, use of average PI may be considered for calculation of EC.
4	R-factor	Should be based on pollution load. For ex. Amount of BOD/NOx etc. discharged.		May be classified based on the contribution of pollution load based on quantity of effluent, concentration, emissions	May be as per the category of industry, for ex. Red-500, Orange-300, Green-100.	As PI is based on the pollution load, suggestion of RDs are already taken care in the formula.
5	L-factor			May be redefined based on the features, activities involved and habitation.		L-factor may be covered in future as already indicated in the report.

Annexure-II

	Item No. 12 **August 03, 2018** **A**	(7) Proceedings are disposed of. However, the report received from the Central Pollution Control Board may be placed for consideration before this Tribunal on 04.09.2018. We place on record our appreciation for the services rendered by the learned Amicus Curiae. ....., CP (Adarsh Kumar Goel) ....., JM (Dr. Jawad Rahim) .....,JM (S.P. Wangdi) .....,EM (Dr. Nagin Nanda) 03.08.2018

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	Item No. 12 **August 03, 2018** **A**	appropriate directions issued. This process may be a continuous process. (iii) It must be ensured that STPs, CETPs and ETPs are functional and meet the requisite standards. (iv) There is already a direction in the above judgment under which 50% of the funds for the purpose are to be provided by the Central Government, 25% by the States and remaining 25% to be arranged by way of loans which is to be re-paid by the user industries. Local bodies and the States have duties as clearly stipulated in the judgment. There has to be online monitoring system by each State to display emission levels in public domain in terms of paragraph 17 of the order of the Hon'ble Supreme Court. (v) A report of the steps taken may be placed on the website of the Central Pollution Control Board atleast once in three months. Deficiencies if any may also be so displayed. (vi) The Central Pollution Control Board may take penal action for failure, if any, against those accountable for setting up and maintaining STPs, CETPs and ETPs Central Pollution Control Board may also assess and recover compensation for damage to the environment and the said fund be kept in a separate account and utilized in terms of an action plan for protection of the environment. Such action plan may be prepared by the Central Pollution Control Board within three months from today. (vii) A compliance report in terms of the above order may be furnished to this Tribunal within four months from today by e-mail at filing.ngt@gmail.com.

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	Item No. 12 **August 03, 2018** **A**	(CETP), whether any such CETP or ETP or STP is properly functioning and treating the effluents as per prescribed limits or not. 5. Learned Amicus Curiae submitted that contamination of water due to industrial effluents can lead to various diseases and adverse consequences on the aquatic organism due to decreased level of oxygen. The use of technology can help reduction of adverse consequences. However, the best solution is to prevent pollution by soil conservation and proper disposal of toxics and chemicals which may include chemical recycling. 6. Having monitored the matter for the last more than one year on several dates, we are of the view that the matter requires continuous monitoring by statutory authorities as per directions which we proceed to issue today. (i) We direct the Central Pollution Control Board (CPCB) to forthwith prepare an action plan after looking into all the status reports. The action plans must have mechanism to ensure compliance or all the directions in the order of the Hon'ble Supreme Court. To enable this to be done, a Nodal officer must be identified to deal with the issue of CETPs/ ETPs/STPs. (ii) A representative of the Ministry of Environment, Forest and Climate Change may be associated with the Nodal Officer of the CETP for monitoring. The Monitoring by the said two officers- the representative of the MoEF and the Nodal Officer of the CPCB must be held atleast once in a month and on the basis of such meeting and the feedback taken further follow up action must be taken and

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	Item No. 12 **August 03, 2018** **A**	*5. That the CPCB has also followed up with all SPCBs and PCCs through letters and review meetings to ensure compliance of the aforementioned judgment and that the matter was also discussed in the 62nd Conference of the Chairmen and Member Secretaries of SPCBs and PCCs held on 27.06.2017. That 26 SPCBs/PCCs have submitted the compliance report, which has been summarized at* ***Annexure-I****.* *6. That the CPCB has also carried out inspections of 17 categories of industries to verify compliance with its directions issued on online effluent/emission monitoring system and to cross-verify online results with manual sampling. During February-June, 2017, 64 industries were inspected and directions under section 5 of the Environment (Protection) Act, 1986 have been issued to 24 non-complying industries; 18 industries were complying; 8 were found closed and inspection reports of 14 industries are under process.* *7. That the CPCB and NMCG through 11 technical institutions, inspected 751 industries located in the River Ganga main stem during March-April, 2017 to verify the status of installation and connectivity of industries discharging effluents as well as their compliance with the standards. Closure directions have been issued to 154 industries; show cause notices issue to 36 industries; 149 industries were found complying and direction issued to 91 self-closed Grossly Polluting Industries (GPI) to remain closed; 93 GPI units were found closed as per directions; 38 GPI units found operational in violation of closure directions and inspection reports of 190 industries are under process".* 3. We have heard learned Amicus Curiae Sh. Jai A. Dehadrai and the learned counsel for Ministry of Environment, Forest and Climate Change, Central Pollution Control Board, various State Pollution Control Boards and the Pollution Control Committees. 4. Learned Amicus Curiae has drawn our attention to orders dated 04.07.2017, 18.09.2017 and 11.10.2017 of the Tribunal directing the State Pollution Control Boards to file a statement as to how many Industrial Units discharging trade effluents or causing emissions exist in the State, how many are having their own STPs, ETPs and/or connected to Common Effluent Treatment Plant

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Ms. Yogmaya Agnihotri, Adv. and Ms. Prity, Adv. for CECB
Ms. Sakshi Popli, Adv. for Ministry of Environment, Forest and Climate Change
Mr. Shuvodeep Roy, Adv. and Mr. Rituraj Biswas, Adv. for State of Tripura & Tripura Pollution Control Board
Mr. Shashank Bajpai and Mr. Shakun S. Shukla, Advs. for State of Odisha
Ms. Asha Nayar Basu and Ms. Aradhita Ghosh Mandal, Advs.
Ms. Priyanka Sinha, Adv. for State of Jharkhand
Mr. Rajul Shrivastav, Adv. for MPPCB
Mr. Pradeep Misra and Mr. Daleep Dhyani Advs. for UPPCB
Mr. R. Rakesh Sharma and Mr. V. Mowli, Advs. for State of TN & TNPCB
Mr. Shubham Bhalla, Adv.
Mr. Shiv Mangal Sharma, AAG, Mr. Saurabh Rajpal, Mr. Adhiraj Singh, Ms.Shikha Sandhu and Mr. Vikrmjeet singh, Advs. for State of Rajasthan and Pollution Control Board
Mr. G. M. Kawoosa, Adv. for State of J & K
Mr. Divya Prakash Pande, Adv. For HPSPCB
Mr. Manish Kumar, Adv.

	Date and Remarks	Orders of the Tribunal
	Item No. 12 **August 03, 2018** **A**	1. This matter was taken by this Tribunal in furtherance to the orders of the Hon'ble Supreme Court dated 22.02.2017 *Paryavaran Suraksha Samiti Vs. Union of India* (2017) 5 SCC 326, establishment and functioning of ETPs/CETP/STPs. 2. Vide order dated 25.05.2017, Notice was issued to Central Pollution Control Board and all the States Pollution Control Boards/Committees and the Ministry of Environment, Forest and Climate Change. They were directed to file status-cum-compliance report in terms of the orders of the Hon'ble Supreme Court. Accordingly, various status reports have been filed. An affidavit has been filed by the Ministry of Environment, Forest and Climate Change dated 04th July, 2017 stating as follows: *"4. That the answering Respondent is engaged in policy formulation, prescribing standards and its implementation through the Central Pollution Control Board (CPCB), State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) for UTs. This Ministry has written to all SPCBs and PCCs as well as to CPCB to ensure compliance of the judgment of the Hon'ble Supreme Court and to submit detailed compliance report.*

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Annexure-I

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 593/2017
(W.P. (Civil) No. 375/2012)

In the matter of:

Paryavaran Suraksha Samiti & Anr.
Vs.
Union of India & Ors.

CORAM : **HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON**
HON'BLE DR. JUSTICE JAWAD RAHIM, JUDICIAL MEMBER
HON'BLE MR. JUSTICE S.P. WANGDI, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

Present:

Applicant: Mr. Rohit Prajapati, Applicant in person
Amicus Curiae: Mr. Jai A. Dehadrai, Adv.
Respondent Nos. Mr. Nishe Rajan Shonker, Adv. for State of Kerala
Mr. Tarunvir Singh Khehar, Ms. Guneet Khehar Mr. Sandeep Mishra Advs. for GNCTD
Mr. Anil Shrivastava Mr Rituraj Biswas and Ms. Sujaya Bardhan, Advs. for State of Arunachal Pradesh
Mr. Jogy Scaria, Ms. Beena Victor, Advs. for Kerala State Pollution Control Board
Mr. Avijit Roy, Adv. for Assam Pollution Control Board
Mr. Leisangthem Roshmani Kh, Ms. Maibam Babina, Advs. for State of Manipur
Mr. Nikhil Nayyar, Mr. Dhananjay Baijal, Advs. for APPCB and TSPCB
Mr. Mukesh Verma, Adv.
Mr. Tarunvir Singh Khehar, Adv., Mr. Sandeep Mishra and Ms. Guneet Khehar, Adv.
Mr. Dinesh Jindal, LO for DPCC
Ms. Aruna Mathur, Mr. Avneesh Arputham, Ms. Simraj Jeet and Ms. Anuradha Arputham, Advs. for State of Sikkim
Mr. Raja Chatterjee, Mr. Piyush Sachdev, Ms. Abhinandini Yadav, Advs. and Advs. for State of WB
Mr. Edward Belho, AAG, Mr. K. Luikang Michael and Ms. Hoineithiam, Advs. for State of Nagaland
Ms. Enatoli Sema, Adv. for State of Nagaland and Pollution Control Board
Mr. M. Paikaray and Mr. A.K. Panda, Advs. for SPCB, Odisha
Mr. Dhruv Pal, Adv. for State of Gujarat
Mr. V.K. Shukla, Adv. for State of MP
Mr. Jayesh Gaurav, Adv. for R-47
Mr. Tayenjam Momo Singh, Adv. for Meghalaya Pollution Control Board
Mr. Shlok Chandra and Mr. Ritesh Kumar Sharma, Advs.
Mr. Gautam Singh and Mr. Shoeab Alam, Advs. for State of Bihar
Ms. Aprajita Mukherjee, Adv.
Ms. G. Indira, Adv. for UT of Andaman & Nicobar
Mr. Balendu Shekhar, Mr. Srianah Prakash and Mr. Rajkumar Maurya, Advs. for Ministry of Environment, Forest and Climate Change
Ms. Puja Kaira, Adv. for SDMC & NDMC
Mr. Anil Grover, AAG, Mr. Rahul Khurana and Mr. Mishal Vij, Advs. for State of Haryana and HSPCB

4.7 Relaxation

Central Ground Water Authority (CGWA) reserves to right to relax or interpret these mechanisms in case of any exigency or situation of National strategic importance, as per Guidelines/Criteria for evaluation of proposals/requests for Ground Water Abstraction, 2015.

4.8 Recommendations

The committee has given following recommendations:

- The minimum Environmental Compensation for illegal extraction of ground water for domestic purpose will be Rs. 10,000, for institutional/commercial use will be 50,000 and for other uses will be 1,00,000.
- In case of fixation of liability, it always lies with current owner of the premises where illegal extraction is taking place.
- Time duration may be assumed to be one year in case where no evidence for period of installation of bore well could be established.
- For Drinking and Domestic use, where metering is not present but storage tank facility is available, minimum water consumption per day may be assumed as similar to the storage capacity of the tank.
- For industrial ground water use, where metering is not available, water consumption may be assumed as per the consent conditions. Further, where in case industry is operating without consent, water consumption may be calculated based on the plant capacity (on the recommendation of SPCB/PCC, if required). SPCB/PCC may bring the issue of illegal extraction of ground water in industries in to the notice of CGWA for appropriate action by CGWA.
- Authorities assigned for levy EC and taking penal action are listed below:

S. No.	Actions	Authority
1.	To seal the illegal bore-well/tube-well to stop extraction of water and further closure of project	District Collector
2.	To levy EC_{GW} as per prescribed method	District Collector, CGWA
3.	To levy EC on water pollution, as per the method prescribed in report of CPCB- "EC on industrial pollution"	CPCB/SPCB/PCC
4.	Prosecution of violator	CGWA under EP Act
		SPCB/PCC under Air and Water Act

- CGWA may maintain a separate account for collection and utilization of fund, collected through the prescribed methodology in this report.

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4.6.4 ECR_{GW} for Industrial Units:

Sl. No.	Area Category	Water Consumption (m^3/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./m^3			
1	Safe	20	30	40	50
2	Semi critical	40	60	80	100
3	Critical	60	80	110	150
4	Over-exploited	80	120	160	200
Minimum EC_{GW}=Rs 1,00,000/-					

For better understanding of implementation of EC_{GW} policy, some example calculations are given below:

Example No. 1 (For drinking and domestic Use):

It is observed that a household in safe zone is extracting ground water illegally from past 2 year and 3 months with the help of 1 HP pump, dia 4 inches and head as 25 meter. It is assumed that the house-owner runs the pump for 0.5 hr/day. What Environmental Compensation (EC_{GW}) will be charged to the owner?

Solution:

Pump Yield *(Please refer Annexure-VI)* = 3 m^3/hr

Daily Consumption = 3 x 0.5 =1.5 m^3

ECR_{GW} = 4 Rs./m^3 *(Please refer para 4.6.1)*

EC to be levied = 4 x 1.5 = 6 Rs./day

Total time period = 820 days

Then, EC_{GW}= 6 x 820

Calculated EC_{GW}= 4,920 Rs.

EC_{GW} to be levied = 10,000 Rs. (minimum prescribed EC_{GW}, *please refer para 4.6.1*)

Example 2 (For Industrial Units):

It is observed that an industry in critical zone is extracting ground water illegally from past 1 year with the help of 5 HP pump, dia 6 inches and head as 50 meter. It is assumed that the industry runs the pump for 3 hrs/day. What Environmental Compensation (EC_{GW}) will be charged to the owner?

Solution:

Pump Yield *(Please refer Annexure-VI)* = 12 m^3/hr

Daily Consumption = 12 x 3 =36 m^3/day

ECR_{GW} = 60 Rs./m^3 *(Please refer para 4.6.4)*

EC to be levied = 60 x 36 = 2,160 Rs./day

Total time period = 365 days

Then, EC_{GW}= 2,160 x 365

EC_{GW}= 7,88,400 Rs.

As per CGWB, safe, semi-critical, critical and over-exploited areas are categorized from the ground water resources point of view (CGWB, 2017). List of safe, semi-critical, critical and over-exploited areas are available on the website of CGWB and can be accessed from- http://cgwa-noc.gov.in/LandingPage/NotifiedAreas/CategorizationOfAssessmentUnits.pdf#ZOOM=150.

Environmental Compensation Rates (ECR_{GW}) for illegal use of ground water (ECR_{GW}) for various purposes such as drinking/domestic use, packaging units, mining and industrial sectors as finalized by the committee are given in tables below:

4.6.1 ECR_{GW} for Drinking and Domestic use:

Drinking and Domestic use means uses of ground water in households, institutional activity, hospitals, commercial complexes, townships etc.

Sl. No.	Area Category	Water Consumption (m^3/day)			
		<2	2 to <5	5 to <25	25 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./m^3			
1	Safe	4	6	8	10
2	Semi Critical	12	14	16	20
3	Critical	22	24	26	30
4	Over-Exploited	32	34	36	40
Minimum EC_{GW}=Rs 10,000/- (for households) and Rs. 50,000 (for institutional activity, commercial complexes, townships etc.)					

4.6.2 ECR_{GW} for Packaged drinking water units:

Sl. No.	Area Category	Water Consumption (m^3/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./m^3			
1	Safe	12	18	24	30
2	Semi critical	24	36	48	60
3	Critical	36	48	66	90
4	Over-exploited	48	72	96	120
Minimum EC_{GW}=Rs 1,00,000/-					

4.6.3 ECR_{GW} for Mining, Infrastructure and Dewatering Projects

Sl. No.	Area Category	Water Consumption (m^3/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./m^3			
1	Safe	15	21	30	40
2	Semi critical	30	45	60	75
3	Critical	45	60	85	115
4	Over-exploited	60	90	120	150
Minimum EC_{GW}=Rs 1,00,000/-					

2. Central Ground Water Authority (CGWA) so far has notified 162 areas, in the country for the purpose of regulation of ground water development.
3. Regulation of Ground Water development in Notified areas is through District Administrative Heads assisted by Advisory Committees under the provisions of Section 4 of the Environment (Protection) Act, 1986.
4. In Notified areas, ground water use in individual houses, infrastructure complexes like group housing societies, hospitals, schools etc. and drinking water requirements of workers in industries can be allowed.
5. NOC for ground water withdrawal will be considered only if Water Supplying Department is not providing adequate water in the area/premises. Proof for this is to be produced from the concerned authority by the applicant.
6. For individual houses, the maximum diameter of the tube-well should be restricted to 4 inch only and the capacity of the pump should not exceed 1HP. For infrastructure projects, maximum diameter of the ground water abstraction structures should be restricted to 150 mm (6 inches) only and capacity of the pump should not exceed 5 HP.
7. Any violation of the above conditions will attract legal action under Section 15 of the Environment (Protection) Act, 1986.

For Non-Notified Areas:

NOC for ground water withdrawal will be considered for industries/infrastructure/packaging as per safe, semi critical, critical and over-exploited criteria.

4.5 Formula for Environmental Compensation for illegal extraction of ground water

The committee decided that the formula should be based on water consumption (Pump Yield & Time duration) and rates for imposing Environmental Compensation for violation of illegal abstraction of ground water. The committee has proposed following formula for calculation of Environmental Compensation (EC_{GW}):

EC_{GW}	=	**Water Consumption per Day x No. of Days x Environmental Compensation Rate for illegal extraction of ground water (ECR_{GW})**

Where water Consumption is in m^3/day and ECR_{GW} in Rs./m^3

Yield of the pump varies based on the capacity/power of pump, water head etc. For reference purpose, yield of the pump may be assumed as given in **Annexure-VI.**

Time duration will be the period from which pump is operated illegally.

In case of illegal extraction of ground water, quantity of discharge as per the meter reading or as calculated with assumptions of yield and time may be used for calculation of EC_{GW}.

4.6 Environmental Compensation Rate (ECR_{GW}) for illegal use of Ground Water

The committee decided that the Environmental Compensation Rate (ECR_{GW}) for illegal extraction of ground water should increase with increase in water consumption as well as water scarcity in the area. Further, ECR_{GW} are kept relaxed for drinking and domestic use as compared to other uses, considering the basic need of human being.

Chapter-IV: Environmental Compensation in Case of Illegal Extraction of Ground Water

4.1 Background

The Hon'ble National Green Tribunal (NGT), Principal Bench in the matter of Shailesh Singh v/s Central Ground Water Board & Ors. (Original Application No. 327/2018) vide order dated 03/01/2019 **(Annexure-V)** directed Central Pollution Control Board (CPCB) that:

> *"CPCB may constitute a mechanism to deal with individual cases of violation of norms, as existed prior to Notification of 12/12/2018, to determine the environment compensation to be recovered or other coercive measures to be taken, including prosecution, for past illegal extraction of ground water, as per law."*

4.2 Constitution of the Committee

In compliance to Hon'ble NGT dated 03/01/2019, CPCB constituted a committee under the Chairmanship of Shri A. Sudhakar, DH, WQM-I Division with Shri P. K. Gupta, DH, IPC-VI, Shri Vishal Gandhi, Sc. D, UPC-I Division and Smt. Suniti Parashar, Scientist B, WQM-I Division as members. The committee was asked to deliberate on this issue and come up with draft formulation of mechanism to determine the Environmental Compensation for illegal extraction of ground water.

4.3 Methodology for Assessing Environmental Compensation

The committee discussed the issue on 07/02/2019, 07/03/2019 and 20/3/2019. The committee deliberated on the issue of Environmental Compensation to be recovered from individuals/industries such as domestic, packaging drinking water units, mining & infrastructure projects and industrial units in case of illegal extraction of ground water. The Guidelines/Criteria for evaluation of proposals/requests for Ground Water Abstraction, 2015 were also discussed and based on this further formulation to levy Environmental Compensation has been evolved.

4.4 Ideology of Environmental Compensation w.r.to illegal extraction of ground water

Ground water is becoming an increasingly scarce resource because of its unabated and indiscriminate over-exploitation. Growth in ground water exploitation, however, has led to a steep fall in water table in several parts of the country. Use of ground water is becoming unsustainable day by day. The falling water table is a matter of special concern since it tends to reduce the accessibility of the resource to small and marginal farmers due to increase in costs of extractions.

Specific conditions applicable in Notified/Non-Notified areas for various users, as mentioned in Guidelines/Criteria for evaluation of proposals/requests for Ground Water Abstraction, 2015 are given below:

For Notified Areas:

1. Permission to abstract ground water through any energized means will not be accorded for any purpose other than drinking water.

3. In order to include deterrent effect for continuous violations, component of O&M and Environmental Externality in EC formula may be increased on exponential basis by 2, 4, and 8 times after every six-months, beyond the time prescribed by authority for ensuring complete treatment of sewage/waste of the city/town.

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Table No. 3.6: Sample calculation for EC to be levied for improper management of Municipal Solid Waste

City	Delhi	Agra	Gurugram	Ambala
Population (2011)	1,63,49,831	17,60,285	8,76,969	5,00,774
Class	Mega-City	Million-plus City	Class-I Town	Class-I Town
Waste Generation (kg. per person per day)	0.6	0.5	0.4	0.4
Waste Generation (TPD)	9809.90	880.14	350.79	200.31
Waste Disposal as per Rules (TPD) (*assumed as 25% of waste generation for sample calculation)*	2452.47	220.04	87.70	50.08
Waste Management Capacity Gap (TPD)	7357.42	660.11	263.09	150.23
Calculated EC (capital cost component) in Lacs. Rs.	17657.82	1584.26	631.42	360.56
Minimum and Maximum values of EC (Capital Cost Component) recommended by the Committee (Lacs Rs.)	Min. 1000 Max. 10000	Min. 500 Max. 5000	Min. 100 Max. 1000	Min. 100 Max. 1000
Final EC (capital cost component) in Lacs. Rs.	**10000.00**	**1584.26**	**631.42**	**360.56**
Calculated EC (O&M Component) in Lacs. Rs./Day	147.15	13.20	5.26	3.00
Minimum and Maximum values of EC (O&M Cost Component) recommended by the Committee (Lacs Rs./Day)	Min. 1.0 Max. 10.0	Min. 0.5 Max. 5.0	Min. 0.1 Max. 1.0	Min. 0.1 Max. 1.0
Final EC (O&M Component) in Lacs. Rs./Day	**10.00**	**5.00**	**1.00**	**1.00**
Calculated Environmental Externality (Lacs Rs. Per Day)	2.58	0.18	0.03	0.02
Minimum and Maximum value of Environmental Externality recommended by the Committee (Lacs Rs. per day)	Max. 0.80	Min. 0.25 Max. 0.35	Min. 0.01 Max. 0.05	Min. 0.01 Max. 0.05
Final Environmental Externality (Lacs Rs. per day)	**0.80**	**0.25**	**0.03**	**0.02**

3.3 Action Plan for Utilization of Environmental Compensation Fund

EC levied in case of failure of preventing the pollutants being discharged in water bodies and failure to implement waste management rules will be deposited in the same fund and will be utilized in the same manner as mentioned in para 1.4.1 of Chapter-I of this report.

3.4 Recommendations

1. The Committee recommended that to begin with, Environmental Compensation to be recovered from individuals/authorities in case of failure of preventing the pollutants being discharged in water bodies and failure to implement solid waste management rules may be calculated with the methodology described in the report.
2. If mixing of Bio-medical Waste or Hazardous Waste is found in Municipal Solid Waste than capital cost component of EC may be increased by a multiplication factor of 1.5.

3.4 Environment Compensation to be Levied on Concerned Individual/Authority for Improper Solid Waste Management:

It is known that estimated MSW generation is approximately 1.5 lakh MT/Day in India (MoHUA Report-2016). As per the principles of SWM Rules, 2016 and PWM Rules 2016, as amended in 2018, the total cost of Municipal Solid Waste management in a city/town includes cost for door to door collection, cost of segregation at source, cost for transportation in segregated manner, cost for processing of MSW and disposal through facility like composting, biomethanation, recycling, co-processing in cement kilns etc.

In view of above, it is estimated that the total cost of processing and treatment of MSW for a city having population size of 1 lakh and generating approximately 50 tons/day of MSW is Rs.15.5 Crores, including capital cost (one time) and O & M cost for one year. The expenditure for subsequent years would be only Rs. 3.5 crores/annum.

CPCB sponsored a survey to ascertain the status of municipal solid waste disposal in 59 cities/towns of India. The survey was conducted by the Environment Protection Training Research Institute (EPTRI), Hyderabad. As per the survey, it is estimated that solid waste generated in small, medium and large cities and towns is about 0.1 kg (Class-III), 0.3-0.4 kg (Class-II) and 0.5 kg (Class-I) per capita per day respectively. The committee opined that 0.6 kg/day, 0.5 kg/day and 0.4 kg/day per capita waste generation may be assumed for mega-cities, million-plus UAs/towns and Class-I UA/Towns respectively for calculation of environmental compensation purposes. Based on these assumptions, Environmental Compensation to be levied on concerned ULB may be calculated with the following formula:

EC = Capital Cost Factor x Marginal Average Cost for Waste Management x (Per day waste generation-Per day waste disposed as per the Rules) + O&M Cost Factor x Marginal Average O&M Cost x (Per day waste generation-Per day waste disposed as per the Rules) x Number of days violation took place + Environmental Externality x N

Where;

Waste Quantity in tons per day (TPD)

N= Number of days from the date of direction of CPCB/SPCB/PCC till the required capacity systems are provided by the concerned authority

Simplifying;

EC (Lacs Rs.) = 2.4(Waste Generation - Waste Disposed as per the Rules) +0.02 (Waste Generation - Waste Disposed as per the Rules) x N + Marginal Cost of Environmental Externality x (Waste Generation - Waste Disposed as per the Rules) x N

Table No. 3.5: Sample calculation for EC to be levied for discharge of untreated/partial treated Sewage

City	Delhi	Agra	Gurugram	Ambala
Population (2011)	1,63,49,831	17,60,285	8,76,969	5,00,774
Class	Mega-City	Million-plus City	Class-I Town	Class-I Town
Sewage Generation (MLD) (*as per the latest data available with CPCB)*	4195	381	486	37
Installed Treatment Capacity (MLD) (as per the latest data available with CPCB)	2500	220	404	45.5
Operational Capacity (MLD) (as per the latest data available with CPCB)	1900	140	300	24.5
Treatment Capacity Gap (MLD)	2295	241	186	12.5
Calculated EC (capital cost component for STPs) in Lacs Rs.	29662.50	2817.50	1435.00	0.00
Calculated EC (capital cost component for Conveyance System) in Lacs. Rs.	127372.50	13375.50	10323.00	693.75
Calculated EC (Total capital cost component) in Lacs Rs.	157035.00	16193.00	11758.00	693.75
Minimum and Maximum values of EC (Total Capital Cost Component) recommended by the Committee (Lacs Rs.)	Min. 2000 Max. 20000	Min. 1000 Max. 10000	Min. 100 Max. 1000	Min. 100 Max. 1000
Final EC (Total Capital Cost Component) in Lacs Rs.	**20000.00**	**10000.00**	**1000.00**	**693.75**
Calculated EC (O&M Component in Lacs Rs./day	459.00	48.20	37.20	2.50
Minimum and Maximum values of EC (O&M Cost Component) recommended by the Committee (Lacs Rs./day)	Min. 2 Max. 20	Min. 1 Max. 10	Min. 0.5 Max. 5	Min. 0.5 Max. 5
Final EC (O&M Component) in Lacs. Rs./Day	**20.00**	**10.00**	**5.00**	**2.50**
Calculated Environmental Externality (Lacs Rs .Per Day)	2.0655	0.2049	0.1395	0.0094
Minimum and Maximum value of Environmental Externality recommended by the Committee (Lacs Rs. Per Day)	Min. 0.60 Max. 0.80	Min. 0.25 Max. 0.35	Min. 0.05 Max. 0.10	Min. 0.05 Max. 0.10
Final Environmental Externality (Lacs Rs. Per day)	**0.80**	**0.25**	**0.10**	**0.05**

Table No. 3.4: Minimum and Maximum EC to be levied for improper municipal solid waste management

Class of the City/Town	Mega-City	Million-plus City	Class-I City/Town and others
Minimum and Maximum values of EC (Capital Cost Component) recommended by the Committee (Lacs Rs.)	Min. 1000 Max. 10000	Min. 500 Max. 5000	Min. 100 Max. 1000
Minimum and Maximum values of EC (O&M Cost Component) recommended by the Committee (Lacs Rs./day)	Min. 1.0 Max. 10.0	Min. 0.5 Max. 5.0	Min. 0.1 Max. 1.0

The application of formula for calculation of EC may be further understood with the example of two typical cases.

3.3 Environment Compensation for Discharge of Untreated/Partially Treated Sewage by Concerned Individual/Authority:

BIS IS-1172:1993 suggests that for communities with population above 100,000, minimum of 150 to 200 lpcd of water demand is to be supplied. Further, 85% of return rate (CPHEEO Manual on Sewerage and Sewage Treatment Systems, 2013), may be considered for calculation of total sewage generation in a city. CPCB Report on "Performance evaluation of sewage treatment plants under NRCD, 2013", describes that the capital cost for 1 MLD STP ranges from 0.63 Cr. to 3 Cr. and O&M cost is around Rs. 30,000 per month. After detail deliberations, the Committee suggested to assume capital cost for STPs as Rs. 1.75 Cr/MLD (marginal average cost). Further, expected cost for conveyance system is assumed as Rs. 5.55 Cr./MLD (marginal average cost) and annual O&M cost as 10% of the combined capital cost. Population of the city may be taken as per the latest Census of India. Based on these assumptions, Environmental Compensation to be levied on concerned ULB may be calculated with the following formula:

EC= Capital Cost Factor x [Marginal Average Capital Cost for Treatment Facility x (Total* Generation-Installed Capacity) + Marginal Average *Capital Cost for Conveyance Facility* x *(Total Generation -Operational Capacity)] + O&M Cost Factor x Marginal Average O&M Cost x (Total Generation- Operational Capacity) x No. of Days for which facility was not available + Environmental Externality x No. of Days for which facility was not available

Alternatively;

EC (Lacs Rs.) = [17.5(Total Sewage Generation – Installed Treatment Capacity) + 55.5(Total Sewage Generation-Operational Capacity)] + 0.2(Sewage Generation-Operational Capacity) x N + Marginal Cost of Environmental Externality x (Total Sewage Generation-Operational Capacity) x N

Where; N= Number of days from the date of direction of CPCB/SPCB/PCC till the required capacity systems are provided by the concerned authority

Quantity of Sewage is in MLD

Therefore, generalized formula for Environmental Compensation may be described as:

EC= Capital Cost Factor x Marginal Average Capital Cost for Establishment of Waste or Sewage Management or Treatment Facility x (Waste or Sewage Management or Treatment Capacity Gap) + O&M Cost Factor x Marginal Average O&M Cost x (Waste or Sewage Management or Treatment Capacity Gap) x No. of Days for which facility was not available + Environmental Externality

Cost to the environment due to untreated/partially treated waste/sewage discharge by concerned individual/authority may be assumed as recommended by the committee, which is mentioned below:

Table No. 3.1: Environmental externality for untreated/partially treated sewage discharge

Sewage Treatment Capacity Gap (MLD)	Marginal Cost of Environmental Externality (Rs. per MLD/day)	Minimum and Maximum value of Environmental Externality recommended by the Committee (Lacs Rs. Per Day)
Up to 200	75	Min. 0.05, Max. 0.10
201-500	85	Min. 0.25, Max. 0.35
501 and above	90	Min. 0.60, Max. 0.80

Table No. 3.2: Environmental externality for improper municipal solid waste management

Municipal Solid Waste Management Capacity Gap (TPD)	Marginal Cost of Environmental Externality (Rs. per ton per day)	Minimum and Maximum value of Environmental Externality recommended by the Committee (Lacs Rs. Per Day)
Up to 200	15	Min. 0.01, Max. 0.05
201-500	30	Min. 0.10, Max. 0.15
501-1000	35	Min. 0.25, Max. 0.35
1001-2000	40	Min. 0.50, Max. 0.60
Above 2000	Max. 0.80	

The Committee further decided to fix a cap for minimum and maximum cost for capital and O&M component for Environmental Compensation, which are given in below tables:

Table No. 3.3: Minimum and Maximum EC to be levied for untreated/partially treated sewage discharge

Class of the City/Town	Mega-City	Million-plus City	Class-I City/Town and others
Minimum and Maximum values of EC (Total Capital Cost Component) recommended by the Committee (Lacs Rs.)	Min. 2000 Max. 20000	Min. 1000 Max. 10000	Min. 100 Max. 1000
Minimum and Maximum values of EC (O&M Cost Component) recommended by the Committee (Lacs Rs./day)	Min. 2 Max. 20	Min. 1 Max. 10	Min. 0.5 Max. 5

Chapter-III: Environmental Compensation to be levied in case of failure of preventing the pollutants being discharged in water bodies and failure to implement waste management rules

3.1 Background

The Hon'ble Supreme Court in its order dated 22.02.2017 in the matter of Paryavaran Suraksha Samiti and another v/s Union of India and others (Writ Petition (Civil) No. 375 of 2012), directed State Governments (including the concerned Union Territories) to set-up Sewage Treatment Plants (STPs), which are already under implementation, within the time lines already postulated. Further, the STPs, which are yet to set-up, to be completed within a period of three years, from today, i.e. by 22.02.2020.

The Hon'ble NGT in its order dated 06.12.2018 **(Annexure-III)** in the matter of Court of its own motion v/s State of Karnataka (Original Application No. 125/2017 and M.A. No. 1337/2018) has given following directions:

> *"Since failure of preventing the pollutants being discharged in water bodies (including lakes) and failure to implement solid and other waste management rules are too frequent and widespread, the CPCB must lay down specific guidelines to deal with the same, throughout India, including the scale of compensation to be recovered from different individuals/authorities, in addition to or as alternative to prosecution. The scale may have slabs, depending on extent of pollution caused, economic viability, etc. Deterrent effect for repeated wrongs may also be provided."*

3.2 Ideology of Environmental Compensation Formula

In compliance of the directions of the Hon'ble Tribunal, the Committee deliberated on the issue of environmental compensation to be recovered from individuals/authorities in case of failure of preventing the pollutants being discharged in water bodies and failure to implement solid and other waste management rules. The Committee has suggested that environmental compensation in these cases should be comprised of two components i.e.

1. Cost saved/benefits achieved by the concerned individual/authority by not having proper waste/sewage management system; and
2. Cost to the environment (environmental externality) due to untreated/partially treated waste/sewage because of insufficient capacity of waste/sewage management/treatment facility.

Cost saved/benefits achieved by not having proper waste/sewage management system includes the interest on capital cost of the waste/sewage management facility and daily operation and maintenance (O&M) cost associated with the facility.

The Committee suggested that annual interest rate as 10% on loan amount, borrowed by concerned individual/authority for setting-up waste/sewage management facility, may be assumed as Capital Cost Factor for calculation of environment compensation. Further, as whole O&M cost is saved by concerned individual/authority for not managing required waste/sewage management system, 100% of the O&M cost saved may be considered as O&M cost factor.

Chapter-II: Environmental Compensation to be levied on all violations of Graded Response Action Plan (GRAP) in NCR.

2.1 Background

The CPCB In-house Committee also discussed that the EC shall also be levied on all violations of Graded Response Action Plan (GRAP) in NCR. The implementing agencies for each activity have been identified and the EC will be levied on these agencies. These violations attract graded amounts of EC depending on the state of ambient air quality, which is given in table below:

Table No. 2.1: Environmental Compensation to be levied on all violations of Graded Response Action Plan (GRAP) in Delhi-NCR.

Activity	State Of Air Quality	Environmental Compensation ()
Industrial Emissions	Severe +/Emergency	Rs 1.0 Crore
	Severe	Rs 50 Lakh
	Very Poor	Rs 25 Lakh
	Moderate to Poor	Rs 10 Lakh
Vapour Recovery System (VRS) at Outlets of Oil Companies		
i. Not installed	Target Date	Rs 1.0 Crore
ii. Non-functional	Very poor to Severe +	Rs 50.0 Lakh
	Moderate to Poor	Rs 25.0 Lakh
Construction sites (Offending plot more than 20,000 Sq.m.)	Severe +/Emergency	Rs 1.0 Crore
	Severe	Rs 50 Lakh
	Very Poor	Rs 25 Lakh
	Moderate to Poor	Rs 10 Lakh
Solid waste/ garbage dumping in Industrial Estates	Very poor to Severe +	Rs 25.0 Lakh
	Moderate to Poor	Rs 10.0 Lakh
Failure to water sprinkling on unpaved roads		
a) Hot-spots	Very poor to Severe +	Rs 25.0 Lakh
b) Other than Hot-spots	Very poor to Severe +	Rs 10.0 Lakh

2.2 Action Plan for Utilization of Environmental Compensation Fund

EC levied on all violations of Graded Response Action Plan (GRAP) in Delhi NCR will be deposited in the same fund and will be utilized in the same manner as mentioned in para 1.4.1 of Chapter-I of this report.

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1.5.2 In case of d, e and f, the Environmental Compensation may be levied based on the detailed investigations by Expert Institutions/Organizations.

1.5.3 The Hon'ble Supreme Court in its order dated 22.02.2017 in the matter of Paryavaran Suraksha Samiti and another v/s Union of India and others (Writ Petition (Civil) No. 375 of 2012), directed that all running industrial units which require "consent to operate" from concerned State Pollution Control Board, have a primary effluent treatment plant in place. Therefore, no industry requiring ETP, shall be allowed to operate without ETP.

1.5.4 EC is not a substitute for taking actions under EP Act, Water Act or Air Act. In fact, units found polluting should be closed/prosecuted as per the Acts and Rules.

*****

1.4.1. When Environmental Compensation is calculated through the Pollution Index:

The amount received by imposing the Environmental Compensation to the industries / organization non-complying with the environmental standards / violating any CPCB's directions shall be deposited in a separate bank account. The amount accumulated will be utilized for Protection of Environment. The following schemes were identified, which may be considered for utilization of Environmental Compensation Fund:

a. Industrial Inspections for compliance verification
b. Installation of Continuous water quality monitoring stations / Continuous ambient air quality monitoring stations for strengthening of existing monitoring network
c. Preparation of Comprehensive Industry Documents on Industrial Sectors / clean technology
d. Investigations of environmental damages, preparation of DPRs
e. Remediation of contaminated sites
f. Infrastructure augmentation of Urban Local Bodies (ULBs) /capacity building of SPCBs/PCCs

The above proposed list may include other schemes also, depending upon the requirement.
Considering the availability of accumulated funds, CPCB will finalize the scheme, keeping in mind the priority, to utilize the funds of Environmental Compensation.

1.4.2. When Environmental Compensation is assessed based on actual damage to the environment by Expert Organization/ Agency:

The amount of Environmental Compensation under this case will be remediation costs, measures requiring immediate and short-term actions, compensation towards loss of ecology, etc., and will be utilized exclusively for the purpose at specific site, based on the detailed investigations by the Expert Organizations/ agencies.

1.5 Recommendations

The Committee made following recommendations:

1.5.1 To begin with, Environmental Compensation may be levied by CPCB only when CPCB has issued the directions under the Environment (Protection) Act, 1986. In case of a, b and c, Environmental Compensation may be calculated based on the formula "EC = PI x N x R x S x LF", wherein, PI may be taken as 80, 50 and 30 for red, orange and green category of industries, respectively, and R may be taken as 250. S and LF may be taken as prescribed in the preceding paragraphs.

For notified Ecologically Sensitive areas, for beginning, LF may be assumed as 2.0. However, for critically Polluted Areas, LF may be explored in future.

f. In any case, minimum Environmental Compensation shall be ₹ 5000/day.
g. In order to include deterrent effect for repeated violations, EC may be increased on exponential basis, i.e. by 2 times on 1st repetition, 4 times on 2nd repetition and 8 times on further repetitions.
h. If the operations of the industry are inevitable and violator continues its operations beyond 3 months then for deterrent compensation, EC may be increased by 2, 4 and 8 times for 2nd, 3rd and 4th quarter, respectively. Even if the operations are inevitable beyond 12 months, violator will not be allowed to operate.
i. Besides EC, industry may be prosecuted or closure directions may be issued, whenever required.

A sample calculation for Environmental Compensation (without deterrent factor) is given at Table No. 1.2. It can be noticed that for all instances, EC for Red, Orange and Green category of industries varies from 3,750 to 60,000 ₹/day.

Table No. 1.2: A sample calculation for Environmental Compensation

Industrial Category	Red	Orange	Green
Pollution Index (PI)	60-100	41-59	21-40
Average PI	80	50	30
R-Factor	250		
S-Factor	0.5-1.5		
L-Factor	1.00-2.00		
Environmental Compensation (₹/day)	**10,000-60,000**	**6,250-37,500**	**5,000-22,500**

1.3.2 In other instances i.e. *d, e and f*, the environmental compensation may contain two parts – one requires providing immediate relief and other long-term measures such as remediation. In all these cases, detailed investigations are required from expert institutions/organizations based on which environmental compensation will be decided. CPCB shall list the expert institutions for this purpose.

In such cases, comprehensive plan for remediation of environmental pollution may be prepared and executed under the supervision of a committee with representatives of SPCB, CPCB and expert institutions/organizations.

1.4 Action Plan for Utilization of Environmental Compensation Fund

The Committee discussed about the utilization of funds, which will be received by imposing Environmental Compensation. The following Action Plan is proposed to utilize the fund for protection of the environment.

The Environmental Compensation shall be based on the following formula:

$$EC = PI \times N \times R \times S \times LF$$

Where,

EC is Environmental Compensation in ₹
PI = Pollution Index of industrial sector
N = Number of days of violation took place
R = A factor in Rupees (₹) for EC
S = Factor for scale of operation
LF = Location factor

The formula incorporates the anticipated severity of environmental pollution in terms of Pollution Index, duration of violation in terms of number of days, scale of operation in terms of micro & small/medium/large industry and location in terms of proximity to the large habitations.

Note:

a. The industrial sectors have been categorized into Red, Orange and Green, based on their Pollution Index in the range of 60 to 100, 41 to 59 and 21 to 40, respectively. It was suggested that the average pollution index of 80, 50 and 30 may be taken for calculating the Environmental Compensation for Red, Orange and Green categories of industries, respectively.
b. N, number of days for which violation took place is the period between the day of violation observed/due date of direction's compliance and the day of compliance verified by CPCB/SPCB/PCC.
c. R is a factor in Rupees, which may be a minimum of 100 and maximum of 500. It is suggested to consider R as 250, as the Environmental Compensation in cases of violation.
d. S could be based on small/medium/large industry categorization, which may be 0.5 for micro or small, 1.0 for medium and 1.5 for large units.
e. LF, could be based on population of the city/town and location of the industrial unit. For the industrial unit located within municipal boundary or up to 10 km distance from the municipal boundary of the city/town, following factors (LF) may be used:

Table No. 1.1: Location Factor Values

S. No.	Population* (million)	Location Factor# (LF)
1	1 to <5	1.25
2	5 to <10	1.5
3	10 and above	2.0

**Population of the city/town as per the latest Census of India*
#LF will be 1.0 in case unit is located >10km from municipal boundary
LF is presumed as 1 for city/town having population less than one million.

Cases considered for levying Environmental Compensation (EC):

a) Discharges in violation of consent conditions, mainly prescribed standards / consent limits.
b) Not complying with the directions issued, such as direction for closure due to non-installation of OCEMS, non-adherence to the action plans submitted etc.
c) Intentional avoidance of data submission or data manipulation by tampering the Online Continuous Emission / Effluent Monitoring systems.
d) Accidental discharges lasting for short durations resulting into damage to the environment.
e) Intentional discharges to the environment -- land, water and air resulting into acute injury or damage to the environment.
f) Injection of treated/partially treated/ untreated effluents to ground water.

1.3.1 In the instances as mentioned at *a, b and c* above, Pollution Index may be used as a basis to levy the Environmental Compensation. CPCB has published guidelines for categorization of industries into Red, Orange, Green and White based on concept of Pollution Index (PI). The Pollution Index is arrived after considering quantity & quality of emissions/ effluents generated, types of hazardous wastes generated and consumption of resources. Pollution Index of an industrial sector is a numerical number in the range of 0 to 100 and can be represented as follows:

PI = *f* (Water Pollution Score, Air Pollution Score & HW Generation Score)

*Pollution Inde*x is a number from 0 to 100 and increasing value of PI denotes the increasing degree of pollution *hazard from the industrial sector.*

CPCB has issued directions to all SPCBs/PCCs on 07.03.2016 to adopt the methodology and follow guidelines prepared by CPCB for categorization of industrial sectors into Red, Orange, Green and White.

The concept of Pollution Index, which was deliberated widely with all stakeholders and agreed, shall be used for calculating Environmental Compensation. This may help in implementation of such provision throughout the country, a successful initiative in vital field of industrial pollution control.

After considering various factors including the policy implementation issues, Committee has come up with following formula for levying the Environmental Compensation in instances as mentioned at a, b and c including non-compliance of the environmental standards / violation of directions.

Chapter-I: Environment Compensation to be levied on Industrial Units

1.1 Background

The Hon'ble National Green Tribunal (NGT), Principal Bench in the matter of OA No. 593/2017 (WP (CIVIL) No. 375/2012, Paryavaran Suraksha Samiti & Anr. Vs. Union of India & Ors. directed Central Pollution Control Board (CPCB) that:

> *"The CPCB may take penal action for failure, if any, against those accountable for setting up and maintaining STPs, CETPs and ETPs. CPCB may also assess and recover compensation for damage to the environment and said fund may be kept in a separate account and utilized in terms of an action plan for protection of the environment. Such action plan may be prepared by the CPCB within three months"* ***(Annexure-I).***

1.2 Constitution of the Committee

In this context, Chairman, CPCB constituted a Committee under the Chairmanship of Shri A. Sudhakar, I/c WQM-I with Shri A. K. Vidyarthi, I/c WQM-II, Shri P. K. Gupta, I/c IPC-VI, Shri Nazimuddin I/c IPC-II and Dr. S. K. Paliwal, Scientist 'D' as members. The Committee was asked to deliberate on this issue and come up with a draft formulation before 15.9.2018.

1.3 Methodology for Assessing Environmental Compensation

The Committee discussed the issue on 4.9.2018, 13.9.2018,17.9.2018 and 09.10.2018. A meeting was also held with Senior Officers of CPCB Head Office and Regional Directorates through video conferencing on 28.09.2018 to discuss the draft report and to seek comments/feedbacks. The comments/feedbacks received and deliberations of the Committee on the same are given in **Annexure-II.**

As per the Hon'ble NGT suggestion, CPCB has invited comments of 3 expert institution, namely, Centre for Science and Environment (CSE), Institute of Economic Growth (IEG) and The Energy Research Institute (TERI). A meeting to incorporate the comments of the expert institutions and to finalize the report, was held on 27/03/2019. The CPCB in-house committee on Environmental Compensation has deliberated on the comments and finalized the report accordingly. The Committee's deliberations are attached as **Annexure-III.**

It was deliberated for developing a formula for imposing environmental compensation on industrial units for violation of directions issued by regulatory bodies and this is the first attempt made. The committee discussed that environmental compensation should be based on "Polluter Pay Principle". The Committee decided to list the instances for taking cognizance of cases fit for violation and levy environmental compensation.

Abstract

Environmental compensation is a policy instrument for the protection of the environment which works on the Polluter Pay Principal. Environmental compensation has already been implemented in various countries, although limited in scope. Experiences from these implementations are mixed and tend to stress the importance of certain principles in order to achieve the overall objective of protection of the environment.

The Hon'ble National Green Tribunal through its various judgments has empowered the Central Pollution Control Board to lay down the methodology to assess and recover compensation for damage to the environment and utilize such amount in terms of an action plan for protection of the environment.

An attempt has been made by the CPCB in-house Committee to develop a methodology for assessing environmental compensation to be levied on concerned industry, authority, individual etc. for the protection of environment. Expert institutions/ NGOs like The Energy and Resources Institute, Centre for Science and Environment-India, Institute of Economic Growth etc. were also consulted to finalize the report. Overall objective is to develop self-sense of responsibility towards the environment and to make defaulters realize their mistake by imposing compensation, which will be utilized for the protection/restoration of the environment.

Although, this is the first attempt in India towards development of methodology for assessing environmental compensation, however, efforts have been made to simplifying the process so that regulatory institutions can easily adopt the methodology for implementation.

Annexure -7

उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड
UTTAR PRADESH POLLUTION CONTROL BOARD

संदर्भ सं0
Ref. No ....H20202....../सी-2/स0-684/24

दिनांक
Date ..26/11/24.....

सेवा में,
जिला खान अधिकारी
जनपद–जालौन।

महत्वपूर्ण

विषय–मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली में विचाराधीन ओ0ए0 संख्या 556/2023 (अरूण तिवारी बनाम उत्तर प्रदेश) प्रकरण में खनिज मिट्टी के अवैध खनन सम्बंधी सूचना प्रदान किये जाने के संबंध में।

महोदय,

कृपया उपरोक्त विषयक केन्द्रीय प्रदूषण नियंत्रण बोर्ड के पत्र संख्या CM-13011/10/2024-LAW-HO-CPCB-HO/5802 dated 28.10.2024 द्वारा मा0 एन0जी0टी0 द्वारा ओ0ए0 संख्या 556/2023 अरूण तिवारी बनाम स्टेट ऑफ यू0पी0 व अन्य में पारित आदेश 16.08.2024 के संदर्भ में जल (प्रदूषण निवारण तथा नियंत्रण) अधिनियम, 1974 एवं वायु (प्रदूषण निवारण तथा नियंत्रण) अधिनियम, 1981 की धारा 18(1)(बी) के अन्तर्गत राज्य बोर्ड को निम्न निर्देश जारी किये गये है :–

I. *to get assessed the extent of illegal mining at all mining sites from which ordinary earth/soil has been mined for the said expressway construction work in Jalaun district;*
II. *to initiate actions immediately for appropriate punitive action as applicable under the law, including levying and realization of environmental compensation, for violation of provisions of environmental laws as mentioned in above paragraphs, after duly following the principle of natural justice;*
III. *to take all necessary actions to ensure that no further illegal mining takes place, and;*
IV. *to get prepared a remediation plan by the project proponent for the illegal mining sites, where illegal mining has taken place for the said expressway construction work in Jalaun district, in consultation with mining department and UPPCB, and get it implemented by the project proponent in a time bound manner.*

उक्त निर्देशों के अनुक्रम में क्षेत्रीय अधिकारी, झांसी के पत्र दिनांक 06.11.2024 व पत्र दिनांक 14.11.2024 द्वारा जनपद–जालौन में बुन्देलखण्ड एक्सप्रेस–वे के निर्माण कार्य के लिए जिन स्थानों पर साधारण मिटटी का खनन किया गया है, उन सभी खनन स्थलों पर अवैध खनन की मात्रा का आंकलन कर सूचना उपलब्ध कराये जाने की अपेक्षा की गयी थी। उक्त के अनुक्रम में आपके पत्र दिनांक 16.11.2024 द्वारा मात्र 32 स्थलों पर मिटटी के अवैध खनन के सम्बंध में सूचनायें प्रेषित की गयी हैं।

अतः आपको निर्देशित किया जाता है कि मा0 एन0जी0टी0 द्वारा ओ0ए0 संख्या 556/2023 अरूण तिवारी बनाम स्टेट ऑफ यू0पी0 व अन्य में पारित आदेश 16.08.2024 व केन्द्रीय प्रदूषण नियंत्रण बोर्ड, दिल्ली के उक्त पत्र दिनांक 28.10.2024 द्वारा जारी निर्देशों के अनुक्रम में जनपद–जालौन में बुन्देलखण्ड एक्सप्रेस–वे के निर्माण कार्य के लिए जिन स्थानों पर साधारण मिटटी का खनन किया गया है, उन सभी खनन स्थलों पर अवैध खनन की मात्रा का आंकलन कर सूचना 03 दिन में बोर्ड को उपलब्ध कराना सुनिश्चित करें।

भवदीय,

Atulesh yadav
(अतुलेश यादव)
मुख्य पर्यावरण अधिकारी, वृत्त–2

प्रतिलिपि–निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

1. सदस्य सचिव, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, दिल्ली।
2. सदस्य सचिव, उ0प्र0 प्रदूषण नियंत्रण बोर्ड, लखनऊ।
3. जिलाधिकारी, जालौन।
4. क्षेत्रीय अधिकारी, उ0प्र0 प्रदूषण नियंत्रण बोर्ड, झांसी को इस निर्देश के साथ प्रेषित कि खान अधिकारी, जालौन से सम्पर्क कर वांछित सूचनायें 03 कार्यदिवसों में प्रेषित कराना सुनिश्चित करें।

Atulesh yadav
मुख्य पर्यावरण अधिकारी, वृत्त–2

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Annexure -8

5-77
17/12/24

प्रेषक,

खान अधिकारी,
जालौन स्थान–उरई।

सेवा मे,

मुख्य पर्यावरण अधिकारी, वृत्त–2,
उ0प्र0 प्रदूषण नियंत्रण बोर्ड,
टी सी 12वी विभूति खण्ड गोमतीनगर,
लखनऊ ।

पत्रांक: २०२5 /खनिज–एमएमसी–30 दिनांक : 13 दिसम्बर 2024

विषयः – मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली में विचाराधीन ओ0ए0 संख्या–556/2023(अरूण तिवारी बनाम उ0प्र0) प्रकरण में खनिज मिटटी के अवैध खनन संबंधी सूचना प्रदान किये जाने के संबंध में ।

महोदय,

कृपया उपर्युक्त विषयक अपने कार्यालय के पत्र सं0 एच–20202/सी–2/सा0/684/24 दिनांक 26.11.2024 का संदर्भ ग्रहण करने का कष्ट करें, जिसके द्वारा विषयांकित प्रकरण में जनपद जालौन में बुन्देलखण्ड एक्सप्रेस वे के निर्माण कार्य के लिये जिन स्थानो पर साधारण मिटटी का खनन किया गया है, उन सभी स्थलो पर अवैध खनन की मात्रा का आंकलन कर सूचना उपलब्ध कराये जाने की अपेक्षा की गयी है।

उपरोक्त के सम्बन्ध में अवगत कराना है कि उपजिलाधिकारी उरई आख्या दिनांक 25.01.2021 के कम में तहसील उरई में बुन्देलखण्ड एक्सप्रेस वे परियोजना में मिटटी के खनन हेतु जारी अनुज्ञा स्थलो में औसत गहराई से अधिक गहराई में साधारण मिटटी का अवैध खनन किया जाना पाया गया था, जिस पर तत्समय प्रभावी उ0प्र0 उपखनिज परिहार नियमावली 1963 के अन्तर्गत नियम–3 व 70 एंव खान एंव खनिज (विकास एंव विनियगन) अधिनियम–1957 की धारा–21 के उल्लघंन पर निम्न विवरण के अनुसार कार्यालय द्वारा 32 स्थलो पर अवैध खनन के लिये नोटिस निर्गत करते हुये 30 दिवस के अन्दर स्पष्टीकरण उपलब्ध कराये जाने हेतु प्रोजेक्ट मैनेजर गावर कान्स्ट्रक्शन कम्पनी पैकेज–4 बुन्देलखण्ड एक्सप्रेसवे बावली रोड कुठौन्द जिला जालौन को नोटिस निर्गत किये गये थे, परन्तु कम्पनी की ओर से नोटिसो के सापेक्ष कोई स्पष्टीकरण पत्रावली में उपलब्ध नही पाये जाने पर गावर कान्स्ट्रक्शन लि0 एसएफ–1 जेएमडी गैलेरिया सेक्टर 48 सोहना रोड गुरूग्राम हरियाणा को पुनः अंतिम नोटिस कार्यालय नोटिस पत्र सं0 1877/खनिज–एम0एम0सी0–30 दिनांक 08.11.2024 निर्गत किया गया। पूर्व में निर्गत नोटिसो का विवरण निम्नवत् है:–

कम सं0	नोटिस पत्र संख्या व दिनांक	मिटटी के अवैध खनन स्थल के ग्राम का नाम	साधारण मिटटी के अवैध खनन की मात्रा (घनमीटर मे)
1	नोटिस सं0 1929/खनिज–एमएमसी–30 दिनांक 10.02.2021	कैथरी	18000
2	नोटिस सं0 1930/खनिज–एमएमसी–30 दिनांक 10.02.2021	वर्ध	80000
3	नोटिस सं0 1931/खनिज–एमएमसी–30 दिनांक 10.02.2021	खरूसा	3600
4	नोटिस सं0 1932/खनिज–एमएमसी–30 दिनांक 10.02.2021	कपासी	46585
5	नोटिस सं0 1933/खनिज–एमएमसी–30 दिनांक 10.02.2021	गिरथान	78000
6	नोटिस सं0 1934/खनिज–एमएमसी–30 दिनांक 10.02.2021	वर्ध	80000
7	नोटिस सं0 1935/खनिज–एमएमसी–30 दिनांक 10.02.2021	गिरथान	12800
8	नोटिस सं0 1936/खनिज–एमएमसी–30 दिनांक 10.02.2021	टिमरो	9375
9	नोटिस सं0 1937/खनिज–एमएमसी–30 दिनांक 10.02.2021	टिमरो	64800
10	नोटिस सं0 1938/खनिज–एमएमसी–30 दिनांक 10.02.2021	टिमरो	220000
11	नोटिस सं0 1939/खनिज–एमएमसी–30 दिनांक 10.02.2021	कपासी	6250

13/12/24

12	नोटिस सं0 1940/खनिज–एमएमसी–30 दिनांक 10.02.2021	कपासी	58368
13	नोटिस सं0 1941/खनिज–एमएमसी–30 दिनांक 10.02.2021	कपासी	192000
14	नोटिस सं0 1942/खनिज–एमएमसी–30 दिनांक 10.02.2021	कपासी	12000
15	नोटिस सं0 1943/खनिज–एमएमसी–30 दिनांक 10.02.2021	कपासी	7920
16	नोटिस सं0 1944/खनिज–एमएमसी–30 दिनांक 10.02.2021	गिरथान	54000
17	नोटिस सं0 1945/खनिज–एमएमसी–30 दिनांक 10.02.2021	गिरथान	54000
18	नोटिस सं0 1946/खनिज–एमएमसी–30 दिनांक 10.02.2021	व्यासपुरा	9075
19	नोटिस सं0 1947/खनिज–एमएमसी–30 दिनांक 10.02.2021	व्यासपुरा	3000
20	नोटिस सं0 1948/खनिज–एमएमसी–30 दिनांक 10.02.2021	व्यासपुरा	72000
21	नोटिस सं0 1949/खनिज–एमएमसी–30 दिनांक 10.02.2021	व्यासपुरा	2000
22	नोटिस सं0 1950/खनिज–एमएमसी–30 दिनांक 10.02.2021	व्यासपुरा	40000
23	नोटिस सं0 1951/खनिज–एमएमसी–30 दिनांक 10.02.2021	व्यासपुरा	5000
24	नोटिस सं0 1952/खनिज–एमएमसी–30 दिनांक 10.02.2021	व्यासपुरा	1700
25	नोटिस सं0 1953/खनिज–एमएमसी–30 दिनांक 10.02.2021	व्यासपुरा	1200
26	नोटिस सं0 1954/खनिज–एमएमसी–30 दिनांक 10.02.2021	डकोर	1200
27	नोटिस सं0 1955/खनिज–एमएमसी–30 दिनांक 10.02.2021	डकोर	1800
28	नोटिस सं0 1956/खनिज–एमएमसी–30 दिनांक 10.02.2021	डकोर	15000
29	नोटिस सं0 1957/खनिज–एमएमसी–30 दिनांक 10.02.2021	डकोर	2400
30	नोटिस सं0 1958/खनिज–एमएमसी–30 दिनांक 10.02.2021	डकोर	6400
31	नोटिस सं0 1959/खनिज–एमएमसी–30 दिनांक 10.02.2021	खरूसा	18480
32	नोटिस सं0 1960/खनिज–एमएमसी–30 दिनांक 10.02.2021	डकोर	11530

उक्त के अनुकम में यह अवगत कराना है कि प्रश्नगत मिटटी के अवैध खनन प्रकरण में गावर कान्स्ट्रक्शन कम्पनी गुड़गांव को कार्यालय के नोटिस पत्र सं0 1877/खनिज–एमएमसी–30 दिनांक 08.11.2024 द्वारा स्पष्टीकरण प्रस्तुत करने के लिये नोटिस प्रेषित किया गया, जिसे पर गावर कान्स्ट्रैक्शन कम्पनी द्वारा अपना स्पष्टीकरण दिनांक 29.11.2024 प्रेषित करते हुये प्रकरण में शमन कराये जाने का अनुरोध किया गया। उक्त स्पष्टीकरण के आलोक में जिलाधिकारी महोदय के आदेश दिनांक 28.11.2024 द्वारा प्रश्नगत मिटटी के अवैध खनन के मामले में उ0प्र0 उपखनिज परिहार नियमावली 2021 के नियम–3 व 58 एंव खान एंव खनिज (विकास एंव विनियमन) अधिनियम–1957 की धारा–4 व 21 के अन्तर्गत प्रति हेक्टयर 03.50 लाख की दर से शास्ति अधिरोपित करते हुये बसूली कराये जाने के निर्देश दिये गये। उक्त आदेश के अनुपालन में गावर कान्स्ट्रक्शन कम्पनी द्वारा अधिरोपित शास्ति कुल रू0 1,29,50,000–00 ई–चालान सं0 AKV 240027534 दिनांक 09.12.2024 द्वारा राजकोष में जमा कर दी गयी है।

उल्लेखनीय है कि मा0 राष्ट्रीय हरित अधिकरण नई दिल्ली में योजित ओ0ए0 सं0 556/2023 अरूण तिवारी बनाम उ0प्र0 राज्य व अन्य में पारित आदेशो के अनुपालन में केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा बुन्देलखण्ड एक्सप्रेस वे निर्माण में प्रयुक्त मिटटी के खनन स्थलो का स्थलीय निरीक्षण/पैमाईश खनन विभाग तथा राजस्व विभाग के अधिकारियों/कर्मचारियों के साथ दिनांक 03–04.07.2024 को संयुक्त रूप से किया गया,जिसका शपथ पत्र श्री रूना उरावं, वैज्ञानिक ई केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा मा0 अधिकरण में दाखिल किया गया है, जो शपथ पत्र का बिन्दु सं0–6 में उल्लेखित है।

श्री रूना उरावं, वैज्ञानिक ई केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा शपथ पत्र का बिन्दु संख्या–7.5 में निम्नवत् वर्णन किया गया है:–

Mining Department, Jalaun has granted 162 mining permissions for mining of soil from 79 villages in district jalaun (total area- 2336.46 acres and total quantity- 17001696 m^3) for package-IV & V in Jalaun District with 889 mining pits to M/s Gawar Construction Limited. These mining permissions were granted between December, 2020 to April 2022.

खान अधिकारी जालौन द्वारा दिनांक 03.07.2024 एवं 04.07.2024 को स्थलीय निरीक्षण के समय जांच टीम द्वारा मांगे गये समस्त अभिलेखों को उपलब्ध करा दिया गया था। साथ ही साथ केन्द्रीय

प्रदषूण बोर्ड के पत्र संख्या 13001/110/2024–एल0ए0डब्लू0–एच0ओ0–सी0पी0सी0वी–एच0ओ0/434 दिनांक 31.07.2024 के क्रम में कार्यालय जिलाधिकारी खनन अनुभाग के पत्र संख्या 1540/खनिज–एम0एम0सी0–30 दिनांक 01.08.2024 द्वारा चाही गयी समस्त सूचना उपलब्ध करा दी गई थी। शपथ पत्र के बिन्दु संख्या 6 से स्वतः स्पष्ट होता है कि खनन विभाग द्वारा समस्त अभिलेख तथा अनुज्ञा पत्रों की प्रति उपलब्ध कराई गई थी। जिसमें मिट्टी खनन की मात्रा का उल्लेख है।

श्री रूना उरावं, वैज्ञानिक ई केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा शपथ पत्र का विन्दु संख्या–7.12 में निम्नवत् वर्णन किया गया है:–

CPCB visited 39 mining permission area with 157 mining pits/area and photograph taken during visit of area is annexed as Annexure-8 Due to heavy rain, approach road to remaining mining sites was not assessable. Hence, visit of remaining sites could not possible.

श्री रूना उरावं, वैज्ञानिक ई केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा शपथ पत्र के बिन्दु संख्या 7.12 से स्वतः स्पष्ट होता है कि जांच के समय भारी मात्रा में बारिश होने के कारण जांच में इंगित क्षेत्रों में पानी भरा हुआ पाया गया।

श्री रूना उरावं, वैज्ञानिक ई केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा शपथ पत्र का विन्दु संख्या–7.15 में निम्नवत् वर्णन किया गया है:–

It was observed that Due to undulated geographical condition of mining areas the quantification/measurement was very difficult during the field visit.

श्री रूना उरावं, वैज्ञानिक ई केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा शपथ पत्र के बिन्दु संख्या 7.15 से स्वतः स्पष्ट होता है कि क्षेत्र की भौगौलिक स्थिति काफी असमतल होने के कारण क्षेत्र का पैमाईश किया जाना कठिन है।

चूकि खनन 03 वर्ष पूर्व में किया गया था, और अधिकांश क्षेत्र किसानों का निजी भूमि है। वर्तमान समय में उक्त खनन स्थल की भूमि में कृषि कार्य हो रहा है। जांच के समय कोई किसानों द्वारा किसी अवैध खनन का शिकायत टीम को नही दिया गया है न तो बयान किया गया है। अनुज्ञा स्वीकृति के समय उक्त भूमि का भौगौलिक स्थिति तथा वास्तविक ऊंचाई/लेवल का तथ्य नही होने के कारण तत्समय उन सभी खनन स्थलो पर अवैध खनन की मात्रा वर्तमान समय में आंकलन किया जाना सम्भव नही है। और न ही यह विचार किया जा पाना संम्भव है कि उक्त शमन के अतिरिक्त कोई अन्य प्रकरण अवैध खनन का पाया गया है। भविष्य में किसी अन्य विभाग द्वारा अवैध खनन के सम्बन्ध में कोई तथ्य प्रकाश में लाता है, उस पर नियमानुसार अग्रिम कार्यवाही किया जायेगा।

अतः उपरोक्तानुसार वस्तुस्थित स्थिति से अवगत होने का कष्ट करें।

भवदीय,

खान अधिकारी
जालौन

प्रतिलिपिः– 1–सदस्य सचिव, केन्द्रीय प्रदूषण नियत्रंण बोर्ड, दिल्ली।
2–सदस्य सचिव, उ0प्र0 प्रदूषण नियत्रंण बोर्ड लखनऊ।
3–जिलाधिकारी जालौन।
4–क्षेत्रीय अधिकारी, उ0प्र0 प्रदूषण नियत्रंण बोर्ड झांसी।

13/12/24

खान अधिकारी
जालौन

Annexure -9

उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड, झांसी
UTTAR PRADESH POLLUTION CONTROL BOARD, JHANSI

संदर्भ सं0 / Ref.No. 731/OA-556/NGT/25 दिनांक / Date 30.01.25

सेवा में,

मुख्य पर्यावरण अधिकारी (वृत्त–2),
उ0प्र0 प्रदूषण नियंत्रण बोर्ड,
लखनऊ।

विषय :–मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली मे विचाराधीन ओ0ए0 संख्या 556/2024 (अरूण तिवारी बनाम उत्तर प्रदेश) प्रकरण में आच्छादित परियोजना मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस.एफ.–1, जे.एम.डी. गलेरिया, सेक्टर–48, सोहना रोड, गुरूगॉव के विरूद्ध पर्यावरणीय क्षतिपूर्ति अधिरोपित किये जाने सम्बन्धी कारण बताओ नोटिस के अनुक्रम में प्राप्त प्रत्यावेदन के संदर्भ मे आख्या का प्रेषण।

महोदय,

कृपया उपरोक्त विषयक बोर्ड मुख्यालय लखनऊ के पत्रांक–एच 22277/सी–2/एन0जी0टी0–684/25 दिनांक–06.01.2025 का संदर्भ ग्रहण करने का कष्ट करे। उक्त पत्र के माध्यम से मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस.एफ.–1, जे.एम.डी. गलेरिया, सेक्टर–48, सोहना रोड, गुरूगॉव के विरूद्ध पर्यावरणीय क्षतिपूर्ति अधिरोपित किये जाने सम्बन्धी कारण बताओ नोटिस के अनुक्रम में परियोजना द्वारा प्रस्तुत प्रत्यावेदन दिनांक–26.12.2024 के अनुक्रम मे आख्या प्रेषित किये जाने के निर्देश प्राप्त है। उक्त से पूर्व मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस.एफ.–1, जे.एम.डी. गलेरिया, सेक्टर–48, सोहना रोड, गुरूगॉव द्वारा अवैध मिट्टी खनन किये जाने एवं राज्य बोर्ड से एक्सप्रेस–वे के निर्माण हेतु सहमति प्राप्त नही किये जाने के आलोक मे परियोजना पर दिनांक–15.01.2020 से दिनांक–31.12.2022 तक की अवधि अर्थात् 1066 दिनों की उल्लंघन अवधि हेतु पर्यावरण क्षतिपूर्ति अधिरोपित करने हेतु बोर्ड मुख्यालय, लखनऊ के पत्र संख्या–H20005/C-2/NGT-684/24 दिनांक–21.11.2024 द्वारा कारण बताओ नोटिस जारी किया गया है। तत्पश्चात् उक्त संदर्भित परियोजना से प्राप्त प्रत्यावेदन के सम्बन्ध में कार्यालय में उपलब्ध अभिलेखों के आधार पर विस्तृत आख्या इस पत्र के साथ संलग्न है।

अतः इस पत्र के साथ संलग्न आख्या मे निहित तथ्यों के परिप्रेक्ष्य मे केन्द्रीय प्रदूषण नियंत्रण बोर्ड के पत्र दिनांक–28.10.2020 मे वर्णित बिन्दु संख्या–02 के अन्तर्गत जारी निर्देशो के अनुपालन हेतु अवैध मिट्टी खनन किये जाने एवं राज्य बोर्ड से एक्सप्रेस–वे के निर्माण हेतु सहमति प्राप्त नही किये जाने के आलोक मे मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस.एफ.–1, जे.एम.डी. गलेरिया, सेक्टर–48, सोहना रोड, गुरूगॉव पर दिनांक–15.01.2020 से दिनांक–31.12.2022 तक की अवधि अर्थात् 1066 दिनों की डिफाल्टर अवधि हेतु पर्यावरणीय क्षतिपूर्ति अधिरोपित करने हेतु बोर्ड मुख्यालय, लखनऊ के पत्र संख्या–H20005/C-2/NGT-684/24 दिनांक–21.11.2024 द्वारा कारण बताओ नोटिस की पुष्टि किये जाने तथा संदर्भित परियोजना पर **रू0 1,33,25,000.00** धनराशि की पर्यावरणीय क्षतिपूर्ति अधिरोपित किये जाने की संस्तुति की जाती है।

संलग्नक–यथोपरि।

भवदीय,

(इमरान अली)
क्षेत्रीय अधिकारी

पृ0सं0 एवं दिनांक उपरोक्तनुसार।

प्रतिलिपि : जिलाधिकारी महोदय, जनपद–जालौन को सादर सूचनार्थ।

क्षेत्रीय अधिकारी

क्षेत्रीय कार्यालय : उ0 प्र0 आवास विकास कालोनी (तालपुरा योजना), कानपुर रोड, झांसी–284001, दूरभाष : 0510–2320473, फैक्स : 0510–2320473
मुख्यालयः टी0सी0–12वी, विभूति खण्ड, गोमती नगर, लखनऊ–226010, दूरभाष : 0522–2720828, 2720681, 2720831, फैक्स : 0522–2720764

उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड Annexure-10

UTTAR PRADESH POLLUTION CONTROL BOARD

संदर्भ सं0
Ref. No ....H20203.......।सी-2।सा0-684।24

दिनाँक
Date ....26।11।24......

सेवा में,

महत्वपूर्ण

मैसर्स गवार कन्स्ट्रक्शन लिमिटेड,
एस0एफ0–1, जे0एम0डी0 गलेरिया, सेक्टर–48, सोहना रोड,
गुरूग्राम (हरियाणा)

विषय–मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली में विचाराधीन ओ0ए0 संख्या 556/2023 (अरूण तिवारी बनाम उत्तर प्रदेश) प्रकरण में रेमेडियेशन प्लान प्रेषित किये जाने के सम्बंध में।

महोदय,

कृपया उपरोक्त विषयक केन्द्रीय प्रदूषण नियंत्रण बोर्ड के पत्र संख्या CM-13011/|10/2024-LAW-HO-CPCB-HO/5802 dated 28.10.2024 द्वारा मा0 एन0जी0टी0 द्वारा ओ0ए0 संख्या 556/2023 अरूण तिवारी बनाम स्टेट ऑफ यू0पी0 व अन्य में पारित आदेश 16.08.2024 के संदर्भ में जल (प्रदूषण निवारण तथा नियंत्रण) अधिनियम, 1974 एवं वायु (प्रदूषण निवारण तथा नियंत्रण) अधिनियम, 1981 की धारा 18(1)(बी) के अन्तर्गत राज्य बोर्ड को निम्न निर्देश जारी किये गये है :–

I. *to get prepared a remediation plan by the project proponent for the illegal mining sites, where illegal mining has taken place for the said expressway construction work in Jalaun district, in consultation with mining department and UPPCB, and get it implemented by the project proponent in a time bound manner.*

उक्त निर्देशों के अनुक्रम में आपको निर्देशित किया जाता है कि मा0 एन0जी0टी0 द्वारा ओ0ए0 संख्या 556/2023 अरूण तिवारी बनाम स्टेट ऑफ यू0पी0 व अन्य में पारित आदेश 16.08.2024 व केन्द्रीय प्रदूषण नियंत्रण बोर्ड, दिल्ली के उक्त पत्र दिनांक 28.10.2024 द्वारा जारी निर्देशों के अनुक्रम में जनपद–जालौन में बुन्देलखण्ड एक्सप्रेस–वे के निर्माण कार्य के लिए जिन स्थानों पर आपकी इकाई द्वारा अवैध मिटटी का खनन किया गया है, उन सभी खनन स्थलों के रेमेडियेशन हेतु खनन विभाग तथा उ0प्र0 प्रदूषण नियंत्रण बोर्ड से समन्वय स्थापित करते हुए समयबद्ध ऐक्शन प्लान 15 दिनों के अन्दर प्रेषित करना सुनिश्चित करें।

O/AEB 06.12.24

भवदीय,

(अतुलेश यादव)
मुख्य पर्यावरण अधिकारी, वृत्त–2

प्रतिलिपि–निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

1. सदस्य सचिव, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, दिल्ली।
2. सदस्य सचिव, उ0प्र0 प्रदूषण नियंत्रण बोर्ड, लखनऊ।
3. जिलाधिकारी, जालौन।
4. क्षेत्रीय अधिकारी, उ0प्र0 प्रदूषण नियंत्रण बोर्ड, झांसी।
5. खान अधिकारी, जनपद–जालौन।

Atulesh Yadav.
मुख्य पर्यावरण अधिकारी, वृत्त–2

Annexure -11

GAWAR
Construction Limited
CIN: U70109HR2008PLC037773

115
30/01/25

GAWAR CONSTRUCTION LIMITED
SF-01, JMD Galleria
Sector-48, Sohna Road
Gurgaon - 122001 (Haryana)
Ph. (0124) 4854000
Fax (0124) 4854001/02
Web: www.gawar.in
E-mail: gcl@gawar.in

GCL/Bundelkhand/F-509/AE/FY2024-25/3686

Date: 30.01.2025

To
The Regional Officer,
Uttar Pradesh Pollution Control Board,
Jhansi, U.P.

To
The Mining Officer,
District Jalaun- Uttar Pradesh

Sub: Development of Bundelkhand Expressway (Package-IV) From Baroli Kharka (Dist. Hamirpur) to Saalabad (Dist. Jalaun) (Km 149+000 to Km 200+000) in the State of Uttar Pradesh on EPC Basis. **Submission of Detailed Report Regarding Remediation Action Plan-Reg.**

Ref:

1. **DM Office Jalaun Letter No. 1877/Khanij-M.M.C.-30, dated 08.11.2024**
2. **Mining Officer Letter No. 1904/Khanij-M.M.C.-30, dated 16.11.2024**
3. **Your Letter No. H20005/C-2/-684/24, dated 21.11.2024**
4. **Our Letter No. GCL/Bundelkhand/F-509/AE/FY2024-25/3649, dated 15.12.2024**

Dear sir,

With reference to the show-cause notice issued by your office vide letter at ref. no. (iii) which has been received on 24.11.2024 and 03.12.2024 at our site office and head office, respectively.

In this regard, the UPPCB, through its directive dated 26.11.2024, instructed us to prepare a time-bound action plan in coordination with the Mining Department and UPPCB for the remediation of illegal mining sites related to the Bundelkhand Expressway construction in Jalaun district.

In response, we have engaged Environmental Specialists Dr. Devendra Kumar Agrawal, Former Expert Member (NGT), to assess the impacted mining areas/sites and develop a comprehensive remediation plan. Enclosed with this letter is a detailed report, which includes:

- Methodology and scope of remediation
- Survey and assessment of affected sites
- Proposed remedial measures and techniques
- Benefits of the remediation plan
- Cost estimation for the implementation of remedial measures

We kindly request you to review the submitted remediation plan and provide necessary approvals for further actions. Please find the enclosed detailed report for your perusal.

With regards

For Gawar Construction Limited

Authorized Signatory
Enc: As Above
Copy to:
1. Gawar Construction Limited, H.O., Gurugram, Haryana

Remediation Plan for Excessive Mined Borrow Areas of Ordinary soil/earth used in Package IV of Bundelkhand Expressway constructed by M/s Gawar Construction Ltd.

Background

Hon'ble National Green Tribunal, Principal Bench, Delhi, vide order dated 06.05.2024 had directed CPCB to submit a report for ascertaining the extent of legal / illegal mining by M/s Gawar Construction Limited in respect of Bundelkhand Expressway.

In compliance of order dated 06.05.2024, CPCB officials carried out site visit during July 03-04, 2024, in 39 mining permission areas comprising 157 mining pits, out of the 162 mining permission areas comprising 889 mining pits, for which Mining Department, Jalaun, granted mining permissions for mining of ordinary soil/earth to be used in Bundelkhand Expressway in two tehsils of Jalaun district constructed during 2020-2022. CPCB submitted the said inspection report on 14.08.2024 for consideration of Hon'ble NGT.

In compliance of subsequent order dated 16.08.2024, CPCB issued direction under Section 18(1)(b) of Water (Prevention and Control of Pollution) Act, 1974, to U.P. Pollution Control Board (UPPCB) on 28.10.2024 to submit action taken report on the following:

1. To get assessed the extent of illegal mining at all mining sites from which ordinary earth/soil has been mined for the said expressway construction work in Jalaun district.
2. To initiate actions immediately for appropriate punitive action as applicable under the law, including levying and realization of environmental compensation, for violation of provisions of environmental laws, after duly following the principle of natural justice.
3. To take all necessary actions to ensure that no further illegal mining takes place.
4. To get prepared a remediation plan by the project proponent for the illegal mining sites where illegal mining has taken place for the said expressway construction work in Jalaun district, in consultation with mining department and UPPCB, and get it implemented by the project proponent in a time bound manner.

UPPCB vide letter dated 26.11.2024 has informed the action taken with respect to the aforesaid CPCB's direction, as below:

1. Regional Officer, UPPCB, Jhansi, wrote letters to District Mining Officer (DMO), Jalaun on 06.11.2024 and 14.11.2024 to provide assessment of all illegal mining of soil related to Bundelkhand Expressway construction in Jalaun district. DMO replied to the above letters by letter dated 16.11.2024 providing details of 32 illegal mining notices issued on 10.02.2021 to M/s Gawar Constructions Ltd. UPPCB has further directed DMO Jalaun on 26.11.2024 to provide the assessment of all illegal mining related to Bundelkhand Expressway construction in Jalaun district.
2. UPPCB issued a show-cause notice on 21/11/2024 to M/s Gawar Construction Ltd. to impose Environmental Compensation of Rs. 1,33,25,000/-(Rupees One Crore Thirty Three Lakh Twenty Five Thousand).
3. UPPCB has also directed M/s Gawar Construction Ltd. On 26.11.2024 to submit time bound action plan within 15 days in coordination with Mining Department and UPPCB on

remediation of all illegal mining sites related to Bundelkhand Expressway construction in Jalaun district.

M/s Gawar Construction Limited requested to prepare appropriate remediation plan for the excessive mining areas/sites for which notice has been given by DM Jalaun on 8th November 2024 vide letter no. 1877/Khanij/MMC-30 in response report by DMO Jalaun dated 25.01.2021. List of all such excessive mining sites for which notice was given by DMO Jalaun is presented subsequently.

Introduction

Uttar Pradesh Expressways Industrial Development Authority ("UPEIDA") is the Project Proponent of the "Bundelkhand Expressway" i.e. a 296.07km long 04 Lane (extendible to 06 lane) access-controlled expressway starting in District Chitrakoot and ending near village Kudrail in district Etawah.

M/s Gawar Construction Limited is one of 4(four) contractors awarded tenders to build the said expressway in a total of 6(six) packages. Package IV from Brolikharka, district Hamirpur to Salabaad district Jalaun was awarded to M/s Gawar Construction Ltd (Sector-48, Sohna Road, Gurugram, Haryana). M/s Gawar Construction Limited, started the work on 15.01.2020 and completed the construction work on 30.06.2022.

At the time of construction, mining of the ordinary soil is required for the filling up of the soil in the Highway Project. It has been reported that during the construction of Bundelkhand Expressway project of Package IV, the illegal mining of soil from the farmer's land has been done by M/S GCL.

Mining department, Jalaun had granted 162 mining permissions for mining of soil from 79 villages in district Jalaun (total area 2336.46 acers and total quantity – 17001696 m3) for package – IV in Jalaun District with 889 mining pits to M/s Gawar Construction Limited. These mining permissions were granted between December 2020 to April 2022.

In compliance to Hon'ble NGT directives, CPCB officials alongwith representatives of Administration (Revenue, Mining, UPPCB, etc.) visited 39 mining permission area with 157 mining pits/area of Package IV of Bundelkhand Expressway and observed that the depth of the borrow soils pits varied from 0.5 m to 16 m, however, as per permission granted by Mining Officer, depth of pits should not exceed 2 m.

In this context, DMO Jalaun vide inspection report dated 25.01.2021 had issued 32 Notices to M/s GCL for the sites where excessive mining was noticed by them. For these sites, in turn DM, Jalaun issued notice to M/s GCL for submission of clarification. Insofar of inadvertent earthwork excavation and excessive mining at above sites is concerned, M/s GCL has already deposited a compensation of Rs. 1,29,50,000 on 09.12.2024.

In order to prepare the remediation plan for the excessive mining sites, it would be appropriate to first understand the physical and environmental setting of the area where the project has been executed.

About Jalaun District

Administrative:

The Jalaun district encompasses a geographical area of 4544 sq.km. It forms the northern most part of the trans-Yamuna tract of the state. The area is bounded in the north by Yamuna River, in the south by Betwa river and its western boundary follows Phuja river. The eastern border is shared with Hamirpur district. The area lies between Latitude 26^0 26' to 25^0 45'North and Longitude 79^0 57' to 78^0 00' East, falling in the survey of India Toposheet No. 54 N and O. Administratively it has been divided into 4 Tehsils with its district headquarter at Orai and 9 (Nine) developmental blocks as given below:

Tehsil	Block	Area (sq.Km)
Jalaun	Jalaun	430.4
	Kuthaund	331.39
Madhogarh	Madhogarh	337.48
	Rampur	337.48
Orai	Dakore	886.64
Kalpi	Mahewa	519.81
	Kadaura	669.49
Konch	Konch	411.39
	Nadigaon	635.8

Drainage:

The district is surrounded by 3 sub basins of rivers e.g. Yamuna in the north flows from west to east, in the south Betwa river also flowing from west to east direction and Pahuja river in the west meet in the Yamuna, flowing from south west to north. Topographically, the area is almost an open plain, nevertheless encircled by a narrow rim of higher ground which breakup in a network of ravines along the river banks giving rise a bad land topography. The area is chiefly drained by three perennial rivers namely, Yamuna, Betwa, and Phuja. There are many minor ephemeral tributaries, viz. Non-Nadi, Kunchamalanga Nadi which drains central parts of the district area.

Yamuna and Betwa are flowing towards east and Pahuja from south to north. The overall drainage of the area forms dendritic pattern. Besides, there is good network of canal system draining from Betwa river through Kuthaund and Hamirpur branches.

Agriculture:

Mono cropping is the most common farming system. Mixed farming in the combination of agriculture and live stock is also quite common in all the areas. Jowar-wheat, Bajra-wheat, Fallow-wheat, Fallow-chickpea, Fallow-field pea, Fallow-lentil, Soyabean-wheat are the important crop rotations followed in different areas.

Irrigation:

In spite of the existence of three major perennial rivers i.e. Yamuna, Betwa and Pahuja in the area, only Betwa river is harnessed through 1227 km long network of Betwa canal system. All the 9 blocks are covered by a good canal network of Kathaund and Hamirpur branches of Betwa canal system, barring Mahewa block which falls in the tail ends of the different canals. The block wise irrigation through different sources and status of agriculture and irrigation sources are shown in respective Tables.

Agricultural land use Area(ha) lac						
Total Area	Net sown area	Area sown more than once	Gross cropped area	Net irrigation area	Gross irrigated area	Rain fed area
454.4	346.7	62.8	409.5	225.7	242.4	121.1

District Irrigation Plan, PMKSY, July,2016

Irrigation through Different sources Jalaun

Sources of irrigation	Area ('000 ha)	Percentage of total irrigated area
Canals	146.9	60.6
Tanks	2.9	1.2
Open wells	24.8	10.2
Bore wells	66.6	27.5
Other sources	1.2	0.5
Total Irrigated Area	242.4	
Pump sets	146.9	60.6

District Irrigation Plan, PMKSY, July,2016

A perusal of the table shows that 60.0 % of the area under irrigation is covered by ground canals and 37.7 % area is irrigated by wells and 1.7 % area is irrigated by other sources. Out of the net sown area of 346.7 lac ha, only 225.7 lac ha area has been brought under irrigation and leaving 104.3 lac ha (30.08 %) land unirrigated.

Climate:

The average annual normal rainfall in the district observed in year 2019-2020 is 774.90 mm (UP State report, 2020). About 90% of rainfall takes place during monsoon period from the month June to September. During the monsoon surplus water is available for the deep percolation to ground water. The mean daily maximum temperature in May is 48.6^0 C, mean daily minimum

temperature is 2.5^{0}C. The mean monthly morning relative humidity is 57% and mean monthly evening relative humidity 42%. The mean wind velocity is 7.3 Kmph. The potential evapotranspiration is 1603.3 mm.

Geomorphology:

The district forms a part of marginal Ganga alluvial plains. Geomorphology bears tremendous control on the ground water regime. The relief, slope, depth of weathering, type material, nature of deposits and thickness and overall assemblage of different land forms plays an important role in the ground water regime in hard rock as well as in the unconsolidated sediments. The minimum elevation of the area is 130m amsl and Maximum elevation is about 162m amsl. Various geomorphic units identified in the area are grouped into four major categories

(1) Pediment zone

(2) Alluvial plain

(3) Ravines land and

(4) Flood plains.

Soil:

Soil of the area can be grouped into four types that commonly occur in Bundelkhand region, these are Mar, Kabar, Parwa, and Rakar. Mar is a dark-coloured clay soil mixed with calcareous nodules (Kankar) with swelling and shrinking character. The soil is friable in dry state, moisture retentive and highly fertile. Kabar is also a fertile soil but contains less amount of clay and lighter in colour than Mar. Kabar and Mar soils are commonly known as black cotton soil and occur in the area of central parts. Parwa generally occurs in the northern parts of area. This is a loamy soil, usually having grey colour. Rakar soil is a coarse-grained red soil, strewn with Kankar. It has less fertility and occurs on ravine slopes. The soil erosion is dominant in Jalaun district because the major portion of rainfall is in very short duration and sandy loam and loam soil is very susceptible. The average soil erosion is 1.80 to 7.15 t/ha and drought frequency is every 1-2 year. (Source ICAR Regional Centre and sediment monitoring Stations)

Geology:

Geologically the area comprises Bundelkhand granite which is overlain by thick pile of recent alluvium. Major parts of the area are covered by recent alluvial deposits, which develop along the rivers mainly derived from Yamuna River and its tributaries. Alluvium is composed of medium to coarse grained sand and gravel admixed with clay and kankar. A large tract of the area is occupied by residual soil of varying thickness, formed due to disintegration of parent rocks beneath. The soil is essentially argillaceous and high in calcium and magnesium content. The entire area is underlain by quaternary alluvium comprising mainly clay, kankar, sand and gravel over the basement of Bundelkhand granites. Ground water potential in granites is poor as they

have little primary porosity. The availability of ground water in these rocks generally depend on the density of secondary porosity developed due to fracturing and weathering. The weathered zone in the granitic rock usually holds good quality of water. The ground water in the alluvium occurs under water table conditions in phreatic zones and under semi confined to confined conditions in the lower zones.

Groundwater:

The ground water in the alluvium occurs under water table conditions in phreatic zones and under semi confined to confined conditions in the lower zone. Exploratory wells constructed by CGWB in part of Jalaun district upto a depth of 150 mbgl. Based on borehole data two types of aquifer systems exist in the district of which the depth ranges are as follows.

(1) 80 – 90 mbgl

(2) 110-145 mbgl.

The average of the stage of ground water development for the district is 57.09 %. During the long term from the year 2013 to 2022 it has been observed that the stage of ground water extraction has increased from 28.61 % in 2013 to 57.09 in year 2022.

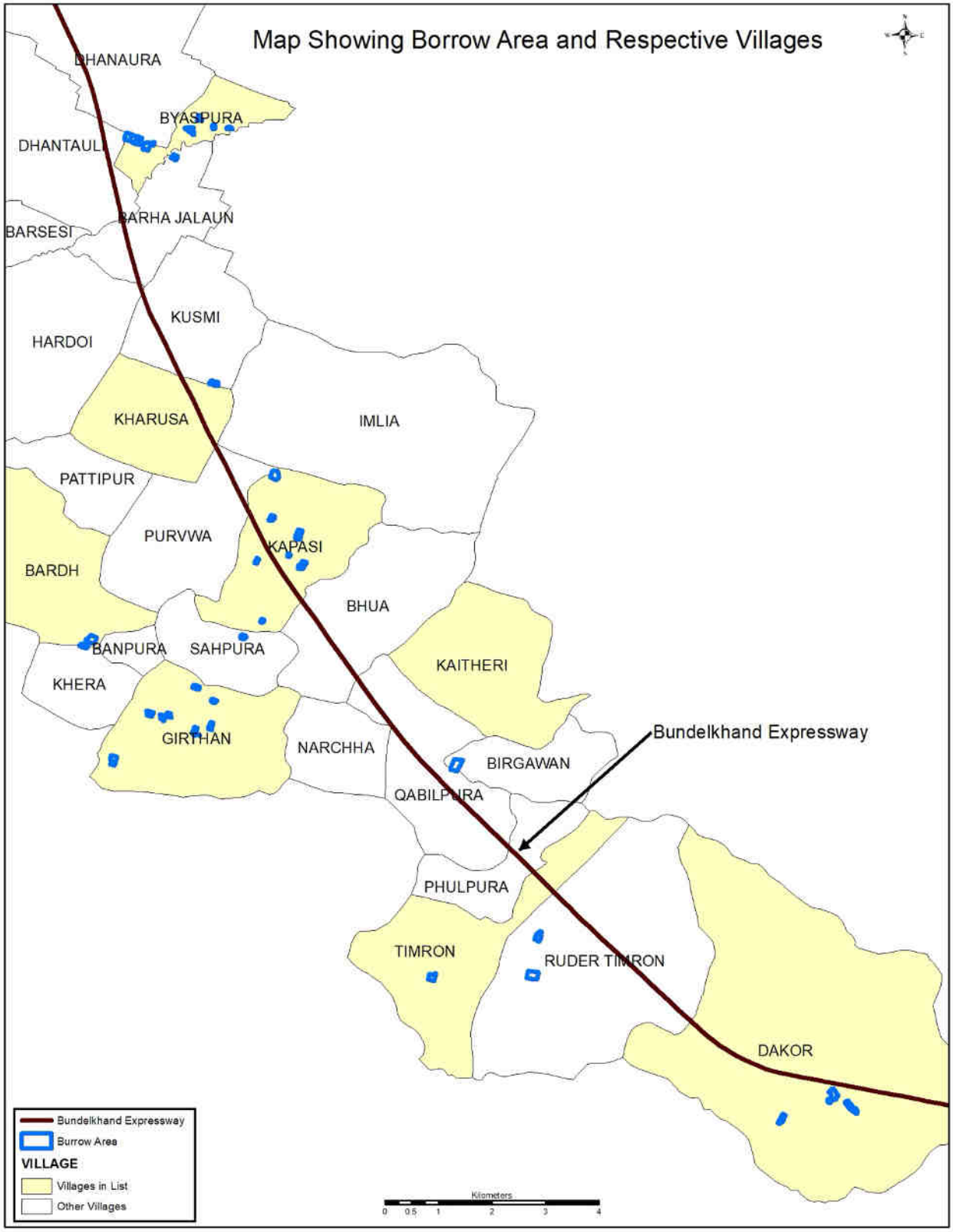
During long term water level trend from the year 2014 - 2023, most of the wells in all the block are showing decline of ground water during pre and post monsoon seasons, which indicate insufficient rainfall in the areas, and needs artificial recharge and water conservation techniques for arresting the decline in water levels.

Air and Water Quality:

UPEIDA, in compliance with its obligations under the Project EC, was required to submit a compliance report every 6(six) months showing compliance with the conditions under which the Project EC was granted. Under the obligations, it was required to submit Air Quality and Water Quality data as well during the project execution. UPEIDA had independently submitted said compliance reports (6 numbers). A bare perusal of the said reports indicate that no impact on Air Quality or Water Quality was ever noticed during the project execution.

Site Visit

A comprehensive site visit was planned to cover all the excessive mining area mentioned in the notice. They are in Total 32 mining area falling in 43 locations in 8 villages namely Kaitheri. Kharusa, Kapasi, Vardh, Girthan, Dakore, Timro and Vyaspura. All villages are adjacent to Bundelkhand Expressway.


Map Showing Borrow Area and Respective Villages
DHANAURA
BYASPURA
DHANTAUL
BARSESI
BARHA JALAUN
KUSMI
HARDOI
KHARUSA
IMLIA
PATTIPUR
PURVWA
KAPASI
BARDH
BHUA
BANPURA
SAHPURA
KAITHERI
KHERA
GIRTHAN
NARCHHA
BIRGAWAN
QABILPURA
Bundelkhand Expressway
PHULPURA
TIMRON
RUDER TIMRON
DAKOR
Bundelkhand Expressway
Burrow Area
VILLAGE
Villages in List
Other Villages
Kilometers
0 0.5 1 2 3 4

Methodology

The methodology involved clear identification of survey scope and objectives, there by gathering existing data, appropriate tools for conducting field measurements, thereafter analyzing collected data, and finally preparing a comprehensive report with drawings and findings towards the remediation plan for excessive mining sites.

Scope

In order to address the issue regarding the Notice given by DMO Jalaun, which states excessive mining has been done on 32 Sites at 45 Location of Orai Tehsil of Jalaun District, site visit was planned to identify all the excessive mining sites which are located in 8 villages namely Kaitheri , Vardh, Kharusa, Kapasi, Girthan, Timro, Vyaspura and Dakore. All these villages are situated on both sides of Bundelkhand expressway.

Preliminary survey

Pre desktop work regarding the collection of existing data like reports and notices about the project were collated to review and scrutinize the available information. Also, khasra Maps of all the villages were downloaded from upbhunaksha.com.

Work during site visit

During the site visit, GPS coordinates of the borrow area were recorded, photographs of the borrow area including the damage caused due to excessive mining was recorded. Friendly interaction with locals were carried out in order to understand their need and requirement.

Observations

At the outset, it is important to mention that since the excessive mining of ordinary earth was the key concern in relation to preparation of the remediation plan in terms of environmental damage that might have taken place. Herein it is noted that in terms of air quality and water, from the perusal of the records, it is evident that no damages had taken place. Similarly, since the mining of ordinary earth was carried out from agricultural fields of individuals with their consent during the fallow conditions, no damage to the flora had taken place as the agricultural fields were devoid of any crops/ vegetation. The only environmental damage that was observed during the field visit was related to likelihood of accelerated erosion owing to the topography. Therefore, the important observations during the site visit is that all the excessive mining area or borrow area can be broadly divided in to two categories (**where it is necessary to note that excessive mining was carried out with the consent of the land owner)**:

1a. Excess mining is carried out to create pond, in order to utilize water for irrigation. In order to utilize water for irrigation purposes in farmers own land and at the same time act as another source of income by providing irrigation water to neighboring farms.

1b. Excess mining is carried out to create fish pond. As fish net and other accessories related to aquaculture is observed in almost all the ponds. It acts as another source of income.

It was revealed from the interaction with the farmers and owners that the prevailing rate for providing irrigation water to agricultural land in vicinity provides them a return of Rs. 500 per irrigation per 0.25 ha. The rate varies with the proximity of farm land from canal and pond owing to transport/supply of water. From the dimensions of each of the pond that has been created, it is very easy to compute volume of water that is stored and taking volume of water required for each irrigation per acre, the additional income each of the pond owner is getting can be very easily calculated.

Similarly, most of the pond owners have introduced fishlings in the pond for commercial fish production and they are using fishnets, gears etc. for harvesting fish providing them additional income.

2. As the topography is too much undulating in the ravine area, the excessive mining is carried out to convert ravine land to flat farm land, as it is difficult to practice agriculture in ravine landforms with excessive soil erosion and low agriculture productivity.

3. While inspecting the excessive mining area it has been observed that, the excavation work is performed alongside the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of the farm land thereby creating a pond. In ravine landform, excessive mining is performed to level the undulating topography, hence excavation is carried out to convert ravines in to flat farm land.

4. Mostly crops grown here are wheat, chickpea, mustard, green pea, lentil etc. It is identified that cash crops commonly grow here, it is also noticed that the entire area is the belt of green pea.

5. The soil type observed in the region along the 8 villages appear to be Mar, Kabar, Parwa and Rakar. Mar soil, also known as black cotton soil, can vary in color, but is often black. Soil is clayey and calcareous, and contains small lumps of kankar. Mar soil is fertile and retains water well. Kabar is a coarse-grained loam with a high clayey element, and is known for its extreme adhesiveness. Kabar soil is fertile and calcareous, but it doesn't retain water as well as Mar soil. it ranges in color from rich dark black to light brown. Kabar soil is productive, but it requires careful and timely management. If not managed properly, it can become difficult to handle. Kabar soil dries quickly and cakes into hard blocks due to its adhesiveness. Parwa soil is a sandy loam soil with a light red-brown color that is low in organic matter. It is also known as Padwa or Paduwa. Parwa soil is also found in the Jalaun, especially in ravines. Parwa soil is responsive to irrigation and fertilizers, and produces excellent yields of millet and gram. It is also known for its finer texture, which makes it more responsive to irrigation and manure. Rakar is a type of red soil found in the ravines, hilly and plateau regions. It is local name for saline soil, saline soils are formed in areas with dry climates and poor drainage, where salts like sodium, calcium, and magnesium accumulate in the top layer of soil. Rakar soil is a refuse

soil that covers sloped areas and is highly retentive of moisture. It is divided into deep and thin Rakar. Rakar soil can be made more fertile with the use of fertilizers. Crops like sesame, grams, and til are commonly grown in Rakar soil. Rakar soil is prone to erosion, but this can be avoided by embankment processes.

6. The region is chiefly drained by mainly 2 perennial rivers namely, Yamuna, Betwa. The other minor ephemeral tributary is Noon Nadi, which drains most parts of these 8 villages. Although, there is good network of canal system draining from Betwa river, but at almost all the location where illegal mining was found, the proximity of the canal is very far or unavailable.

7. While interacting with the locals regarding irrigation facilities, as the area is draught prone and it is identified that scarcity and lack of surface irrigation facilities during non-monsoon season is a great concern. Ground water is also depleting and it is reported that the observed depth of bore is around 100 m to 120m.

8. With the above mention observation, it is clearly understood that the practice of excess mining is done to cope up with the scarcity of water for irrigation purpose and also the need of flat farm land in ravine areas.

9. As the excavation is done vertically downward without creating any slope. It destabilizes the bunds resulting in subsidence, also causing base flow and soil erosion from adjacent field causing damage to farm land and reducing productivity. Apart from this, as the sites where excavation is done for creating ponds, the rainwater from adjoining agricultural land finds way to the pond where the slope is towards the ponds. This resulted in formation of gullies at many of the agricultural fields that adjoin the pond. The remediation plan is required to reinforce the borrow area so as to stop the erosion and create a stable slope with vegetation cover to check base flow and erosion.

Analysis after site visit

The spatial data is analyzed in available Geo-Platforms Like Arc GIS, Global Mapper, QGIS, apart from that Google earth is also used to analyze the data. All the available khasra maps are geo-processed and the geotagging to photographs are performed spatially. Digital elevation model of the region has been created, along with flow accumulation and flow direction raster has been developed to have proper visual picture of the region to analyze the natural flow condition. The issues commonly observed is mismatching of khasra number of various borrow area vis-à-vis their GPS coordinates referenced sajra maps as provided in the list below:

S.No	Notice No.	Village	Gata Sankhya	Georeferencing	Remarks
1	1929/Khanij-M.M.C.-30	Kaitheri	365	Y	Verified
2	1930/Khanij-M.M.C.-30	Vardh	459	Y	Verified
3	1931/Khanij-M.M.C.-30	Kharusa	27	N	Falling Outside khasra

4	1932/Khanij-M.M.C.-30	Kapasi	191/2	Y	Verified
	1932/Khanij-M.M.C.-31	Kapasi	181	Y	Verified
5	1933/Khanij-M.M.C.-30	Girthan	165	N	Falling on Khasra 51
	1933/Khanij-M.M.C.-31	Girthan	138	N	Falling on Khasra 107
	1933/Khanij-M.M.C.-32	Girthan	156	Y	Verified
	1933/Khanij-M.M.C.-33	Girthan	29	N	Falling on Khasra 138
6	1934/Khanij-M.M.C.-30	Vardh	458	Y	Verified
7	1935/Khanij-M.M.C.-30	Girthan	392	N	Falling on Khasra 27
	1935/Khanij-M.M.C.-31	Girthan	103	N	Falling on Khasra 163
	1935/Khanij-M.M.C.-32	Girthan	33	N	Falling on Khasra 25
8	1936/Khanij-M.M.C.-30	Timro	705	Y	Verified
	1936/Khanij-M.M.C.-31	Timro	706	Y	Verified
	1936/Khanij-M.M.C.-32	Timro	707	Y	Verified
	1936/Khanij-M.M.C.-33	Timro	708	Y	Verified
	1936/Khanij-M.M.C.-34	Timro	709	Y	Verified
9	1937/Khanij-M.M.C.-30	Timro	224	Y	Verified
10	1938/Khanij-M.M.C.-30	Timro	605	Y	Verified
11	1939/Khanij-M.M.C.-30	Kapasi	295	Y	Verified
12	1940/Khanij-M.M.C.-30	Kapasi	321	Y	Verified
13	1941/Khanij-M.M.C.-30	Kapasi	134/1	Y	Verified
14	1942/Khanij-M.M.C.-30	Kapasi	215	N	Falling on Khasra 236
15	1943/Khanij-M.M.C.-30	Kapasi	34	N	Falling on Khasra 215
16	1944/Khanij-M.M.C.-30	Girthan	157	Y	Verified
17	1945/Khanij-M.M.C.-30	Girthan	25	N	Not Verified
18	1946/Khanij-M.M.C.-30	Vyaspura	220	Y	Verified
19	1947/Khanij-M.M.C.-30	Vyaspura	240	Y	Verified
20	1948/Khanij-M.M.C.-30	Vyaspura	348	Y	Verified
21	1949/Khanij-M.M.C.-30	Vyaspura	325	N	Falling on Khasra 268
22	1950/Khanij-M.M.C.-30	Vyaspura	394/1,386/2	Y/N	Verified/Out Side Khasra Map
23	1951/Khanij-M.M.C.-30	Vyaspura	391	Y	Verified
24	1952/Khanij-M.M.C.-30	Vyaspura	407, 408	Y	Verified
25	1953/Khanij-M.M.C.-30	Vyaspura	400	Y	Verified
26	1954/Khanij-M.M.C.-30	Dakore	2771, 2772		
27	1955/Khanij-M.M.C.-30	Dakore	2287		
28	1956/Khanij-M.M.C.-30	Dakore	2259		
29	1957/Khanij-M.M.C.-30	Dakore	2919		
30	1958/Khanij-M.M.C.-30	Dakore	2921		
31	1959/Khanij-M.M.C.-30	Kharusa	247	N	Falling Outside khasra
32	1960/Khanij-M.M.C.-30	Dakore	2928		

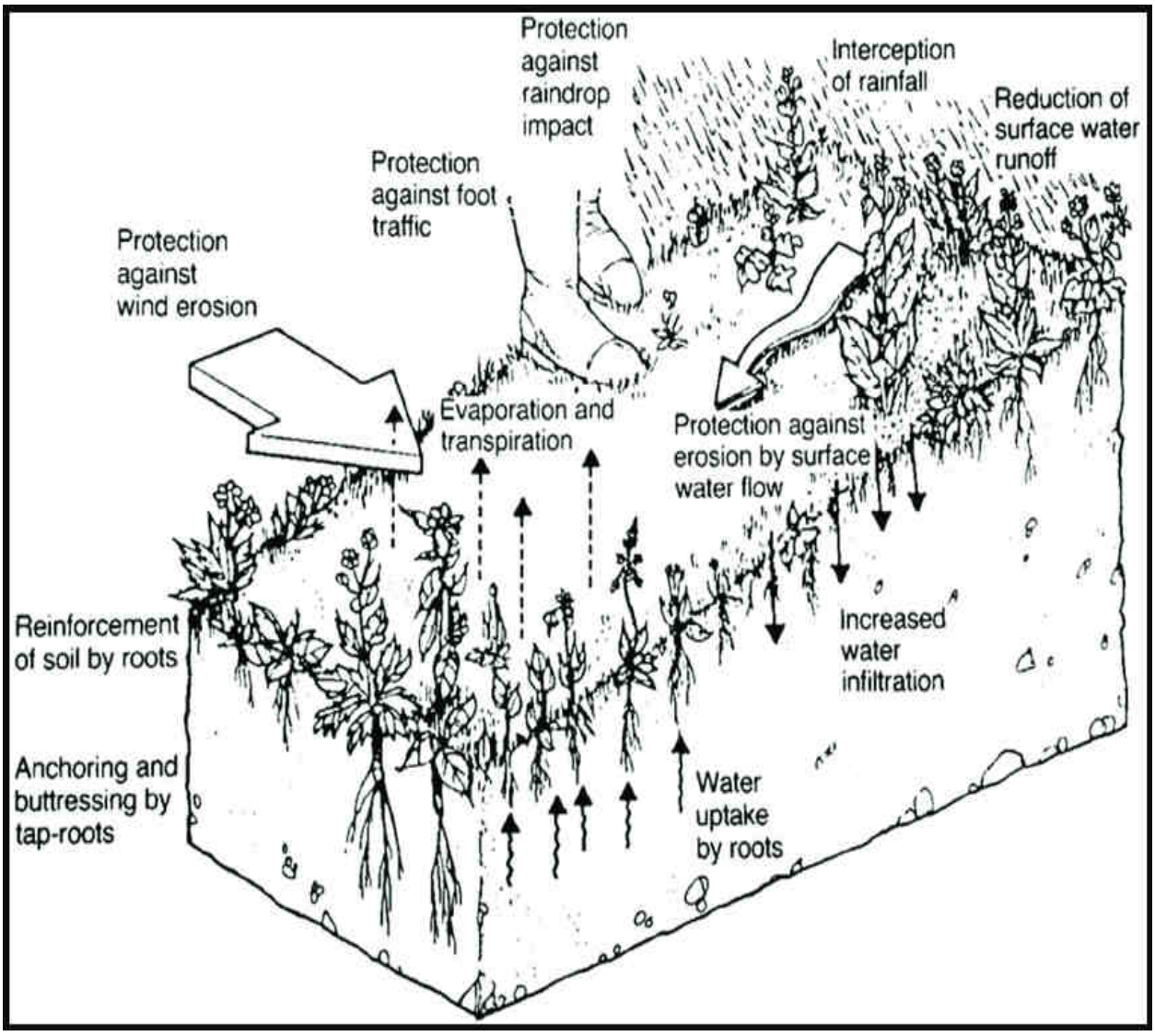
Remedial Measures: Concept

The concept of remediation plan to rebuilt the borrow area is to with stand the natural condition of the surrounding for a long time. Bio Engineering practice offers complete solution to stabilize the slope and check soil erosion. The use of any form of vegetation, either alone or in conjunction with other physical measures, as an engineering material (i.e., one that has quantifiable characteristics and behavior) is referred to as BIOENGINEERING or BIOTECHNICAL ENGINEERING. Bioengineering has assumed much significance in landslide hazard mitigation, torrent control, rehabilitation of mine-spoils, bouldery lands, and for natural or man-made slope stabilization. Another factor that appears to have greatly contributed to the rapid adoption of bioengineering practices pertains to increased environmental awareness, time-tested sustainability of traditional practices of slope stabilization and on account of being relatively inexpensive. The vegetative measures are sustainable due to their inherent capacity to respond to varying spatio-temporal site conditions and low maintenance costs.

Benefits

1. In Bioengineering, emphasis is on the use of locally available materials such as plant species, stone chips, etc.
2. Preservation of environment without Disturbance as it is minimized by avoidance of construction related material and decreased soil erosion and slope instabilities by the use of vegetal cover.
3. Appropriate labor-based technology provides employment opportunities, to mostly unskilled or semi-skilled manpower, offers tremendous employment scope for the local inhabitants. This also recycles the money at local level.
4. Use of vegetal cover for protection against erosion and the use of underground root system of vegetation for slope stabilization makes optimum utilization of the various components of entire natural process.

In order to prevent soil erosion, protect surrounding farm land and contain water in borrow area, effort has to be taken for slope stabilization and prevention. As proper Sloping and benching is not possible in current situation. Vegetation cover under natural condition with proper slope of embankments is the only factor that can maintain the current situation. As it is well known that absence of vegetation cover cause erosion, therefore vegetation cover along with bioengineering practice on bunds and slope will be safe and long-term solution to slow, minimize and ultimately check the erosion and slope stability.



Remedial Techniques

For slope stabilization the benefits of vegetation depend on the type of vegetation as well as on the nature and extent of slope degradation processes. Based on the past experience regarding the use and efficacy of various soil erosion control methods, a number of practices have been adopted for stabilizing slopes; these could be classified in two broad groups:

1) Grass planting techniques – Will be used along the perimeter of Borrow Area in order to prevent land subsidence and stability of slope.

2) Vegetative structures – Will be used on Gully Erosion prone area, mainly live check dam/ brush layering technique in combination with creation of 2 or 3 live check dam on the entire formation.

The bushes commonly found in the Bundelkhand region include "karaunda" (Carissa spinarum), "seja", "salai" (Boswellia serrata), and "dhau" (Anogeissus latifolia). These shrubs often grow amidst the rocky terrain of the plateau as well. Key points about Bundelkhand bushes are:

• Thorny nature: Many bushes in Bundelkhand have thorny stems, adapting to the harsh climate and providing protection from grazing animals.

• Drought-resistant: Due to the region's semi-arid conditions, the bushes are well adapted to low rainfall and can survive with limited water.

• Medicinal properties: Some of these shrubs are used in traditional medicine for various ailments.

3. Slope Stabilization - Grass Planting along the entire perimeter of borrow area after providing proper level @60 degrees to provide a barrier to the raindrops and resulting overland flow entering the pond in the depression area. This will provide stability of Slope. Before plantation, slope of almost 60 -65 degrees will be created along the entire boundary. Rows will be formed down the slope with proper spacing by plantation of grass in geometric lines down the slope.

Naturally deep-rooted grasses that establish quickly, such as turf-type tall fescue grasses, are excellent choices for erosion-prone spots. Fast-germinating annual and perennial ryegrasses help stabilize slopes quickly and control erosion while deeper rooted grasses become established and take hold.

The vetiver grass in India having scientific name *Vetiveria zizanioides* is suggested for plantation along the slope. It is also known as khus in western and northern India. Vetiver hedges are most effective when planted on down slope. Vetiver plants are used in land and slope stabilization applications behave more like fast-growing trees or shrubs. Its extensive, thick root system binds the soil, making it very difficult to dislodge and extremely tolerant to drought.

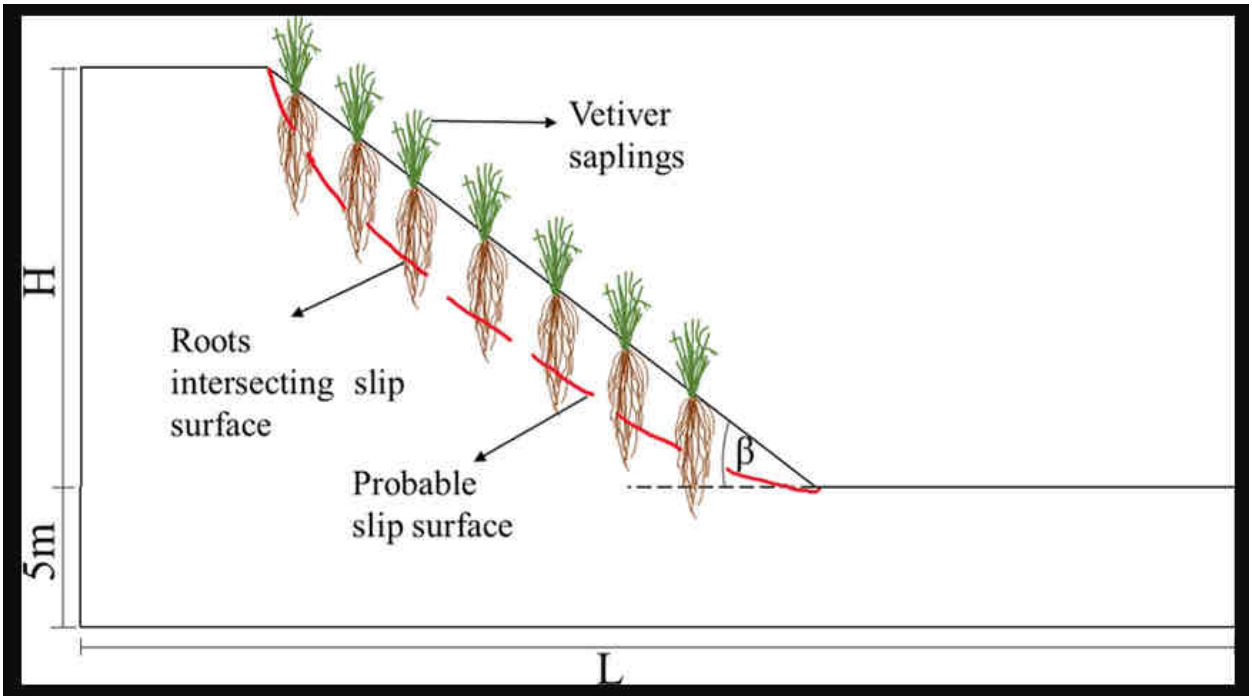
Site Preparation

The present situation of borrow area required site preparation for plantation which include cleaning of debris; clearing the land of vegetation and obstacles. The first operation to be performed along the entire perimeter to borrow area is Slope Grading. As observed the entire embankment of borrow area is damaged by subsidence and erosion.

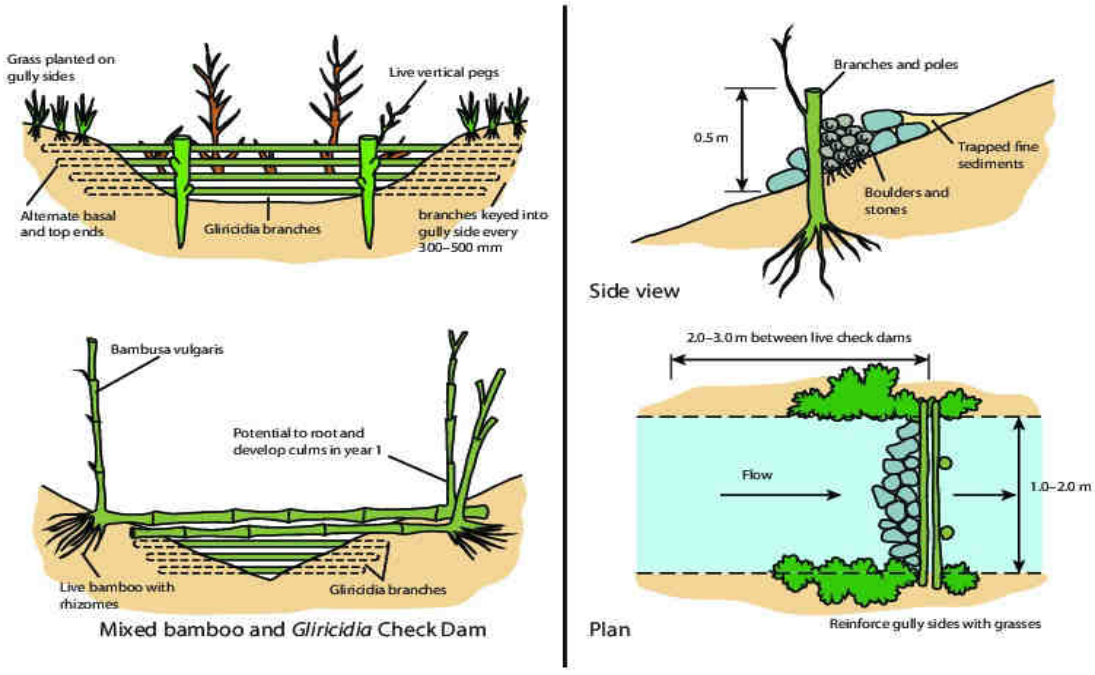
Slope Grading is the process of changing the steepness or inclination of a landform so that it can be used to improve the stability of terrain by providing a stable grade of slope. The grade or gradient of a slope is a measure of its steepness, and can be expressed as a percentage or in ratio. For example, a gradient of 1% means that the slope rises or falls by 1 meter for every 100 meters of forward travel. Here in our case, a slope ratio of 3:2 is provided which means slope rises to 1.5m with every 1 m forward movement.

The entire perimeter of borrow area is first to be conserved with Slope Grading, afterwards plantation is done down the slope where 2 consecutive rows are developed for plantation Down the slope with vertical distance of 750mm between the rows.

For the treatment of Gully Erosion, live check dams/ brush layering is proposed to be constructed with spacing of 1 to 1.5 meters in the entire affected area. Large and very active gullies require stronger measures, which cannot be provided by vegetation alone. Flexible check dams made from a variety of woody cuttings are therefore proposed.



Vetiver Sapling Plantation



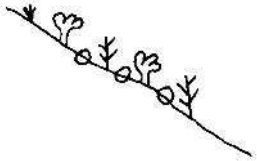
Live Check dam

Features
Description: Lines of woody cuttings laid in trenches with tops protruding above surface.
Critical slope:≤45°

Spacing: Cuttings laid in double rows at 50 mm centers (i.e. 40 cuttings/ running m). Layer spacing:
Slope<30°: 4000 mm; Slope 30-45°: 2000 mm
Advantages/ Limitations
- Strong and low cost barrier to trap material and to reinforce the soil.
- Construction causes disturbance to the slope.

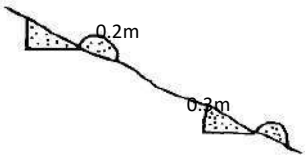
Brush layering

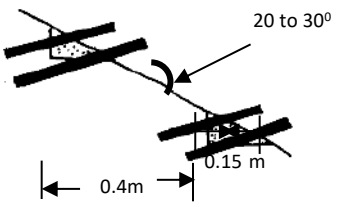
Step by step procedure for Brush layering



- Clean the surface to be treated of loose stone chips/debris etc. and unwanted vegetation.

- Dig trenches 0.2 m deep, 0.3 m wide all along the length of slope at suggested intervals on the entire slope.
- Fill the trenches with good soil, if the original soil forming the slope is poor.





- Drive hard wood cuttings (0.4m long) with top protruding 0.15 m above in double rows at 5 cm intervals (row to row and cutting to cutting both) at an angle of 20° to 30° with horizontal.

Rate analysis for Remediation Measures

For various works, the labour rates have been taken as below:

Minimum Wages, per Day		
Class of Workers	Minimum Wage Per Day	VDA Per Day
Unskilled	Rs. 250.00	Rs. 143.27
Semi-skilled	Rs. 271.42	Rs. 154.81
Skilled	Rs. 324.42	Rs. 154.81
Highly Skilled	Rs. 374.42	Rs. 154.81
		20-Dec-24

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

2. Grass Plantation:

Item	Quantity md	Rate/Unit	Amount (Rs.)
Ø Unskilled labour	1.5	250	375
Ø Equipment, 3% of labour	0.03	250	7.50
Construction of beds for grass slips			
Ø Unskilled labour	2	250	500
Ø Skilled labour	3	324.42	973.26
Ø Equipment, 3% of labour	0.03	324.42	9.75
Transplanting grass slips in to beds from clumps			
Ø Unskilled labour	1.5	250	375
Ø Equipment, 3% of labour	0.03	250	7.50
Uprooting and preparing grass slips ready for Site planting from Nursery			
Ø Unskilled labour	2	250	500
Ø Equipment, 3% of labour	0.03	250	7.50
Planting grass slips on slopes including preparation of slips on Site			
Ø Unskilled labour	2	250	500
Ø Equipment, 3% of labour	0.03	250	7.50
Total cost of Planting 1000 slips			3263.01

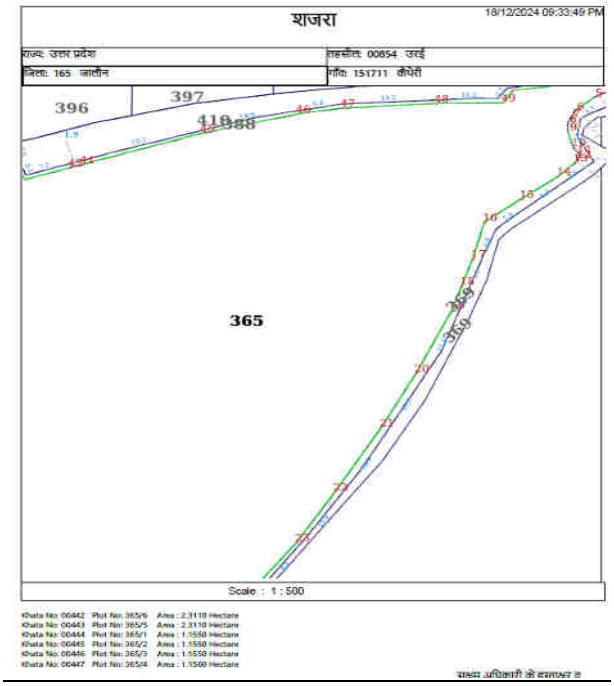
Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters.

3. Check dam/ Brush Layering:

Schedule of Rates for Brush layering/ Live check dams, per running meter			
Item	**Quantity md**	**Rate/Unit**	**Amount (Rs.)**
Collection of hardwood cuttings			
Ø unskilled labour	0.34	250	85
Slide preparation: earth work in excavation of trench, 0.2m			
Ø Unskilled labour	0.06	250	15
Laying of cuttings, including backfilling of the trench and careful			
Ø Unskilled labour	0.17	250	42.50
Total	1.6		142.50

1. Kaitheri: Gata No. 365 **(**S. No-1 - Notice No - 1929/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 5 m soil has been carried out form Gata No. 365. It is having a total plot area of 9.243 Hectare.



Google Imagery (Date-05/09/2023)

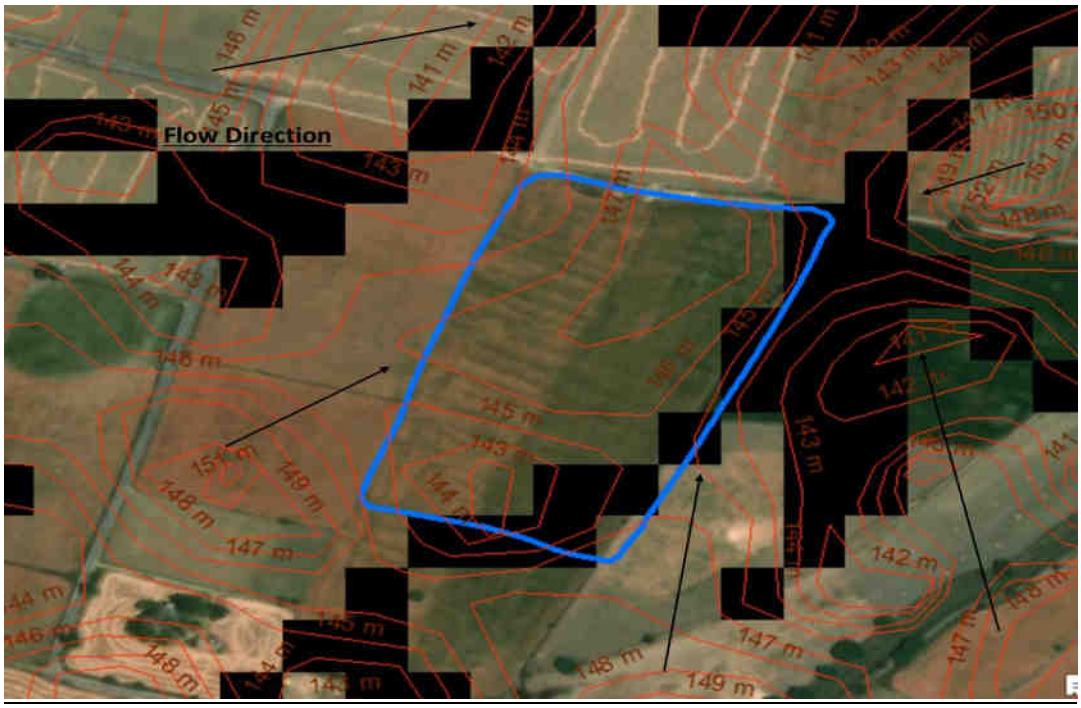
Photographs

Current Situation

The borrow area is situated on east side of expressway. It is having almost rectangular shape, vegetation and shrubs are almost absent in borrow area and all sides have farm land. The village road is on north side sharing its bunds with borrow area. The canal is situated on south east direction. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from south west to north east direction, from east to west direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
61	1.5	1	0.75	45.75	175	8006.25
56	1.5	1	0.75	42	175	7350
48	1.5	1	0.75	36	175	6300
61	1.5	1	0.75	45.75	175	8006.25
60	1.5	1	0.75	45	175	7875
59	1.5	1	0.75	44.25	175	7743.75
75	1.5	1	0.75	56.25	175	9843.75
60	1.5	1	0.75	45	175	7875
57	1.5	1	0.75	42.75	175	7481.25
42	1.5	1	0.75	31.5	175	5512.5
59	1.5	1	0.75	44.25	175	7743.75
57	1.5	1	0.75	42.75	175	7481.25
Total				521.25	175	91218.75

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	671	3263.01	21894.80
Perimeter 2	657	3263.01	21437.98
Total			43332.77

3. Brush Layering:

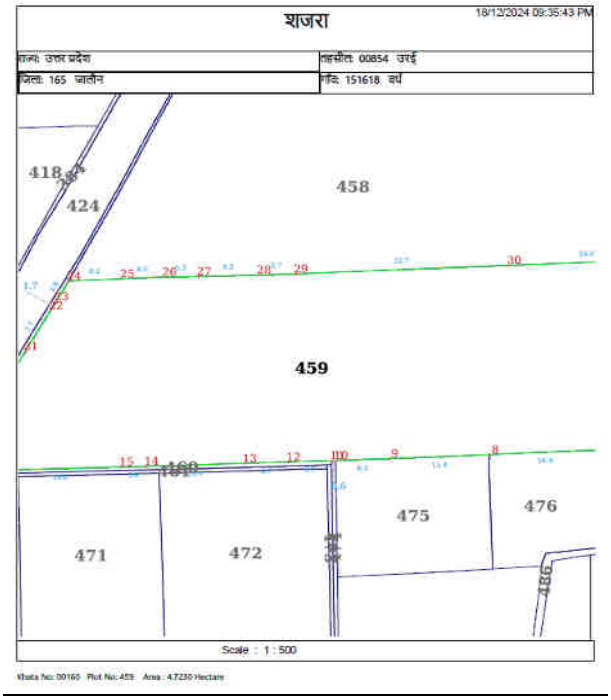
Brush Layering:	Length	Unit Price	Total
Entire Embankment	688	142.5	98040

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 98040/-.

The total cost of remediation plan would be Rs. 232591.52 /-.

2. Vardh: Gata No. 459 (S. No-2 - Notice No - 1930/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 10m soil has been carried out form Gata No. 459. It is having a total plot area of 4.7230 Hectare.



Google Imagery (Date-05/09/2023)

Photographs

Current Situation

The borrow area is situated on east side of road, with canal flowing in west direction. It is having almost rectangular shape, vegetation and shrubs are almost absent in borrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from south to north direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction

Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
47	1.5	1	0.75	35.25	175	6168.75
43	1.5	1	0.75	32.25	175	5643.75
35	1.5	1	0.75	26.25	175	4593.75
58	1.5	1	0.75	43.5	175	7612.5
44	1.5	1	0.75	33	175	5775
37	1.5	1	0.75	27.75	175	4856.25
40	1.5	1	0.75	30	175	5250
55	1.5	1	0.75	41.25	175	7218.75
Total				198	175	47118.75

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	337	3263.01	10996.34
Perimeter 2	321	3263.01	10474.26
Total			21470.61

3. Brush Layering:

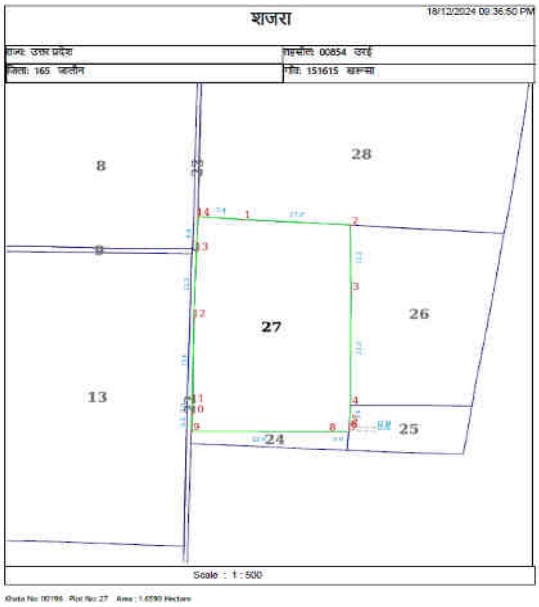
Brush Layering:	Length	Unit Price	Total
Entire Embankment	355	142.5	50587.5

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 50587.5/-.

The total cost of remediation plan would be Rs. 119176.85 /-.

3. Kharusa : Gata No. 27 **(**S.No-3 - Notice No - 1931/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 2 m soil has been carried out form Gata No. 27. It is having the total plot area as 1.6590 Hectare.



Google Imagery (Date-5/9/2023)

Photographs

Current Situation

The borrow area has no access road, it is situated on west side of canal sharing border. The canal is lined near the borrow area. Vegetation and shrubs are absent in borrow area and all sides have farm lands with barb wire fencing on west side. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. Visual marks of subsidence in north side of borrow area. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from west to east direction, from north to south direction, towards the borrow areas.

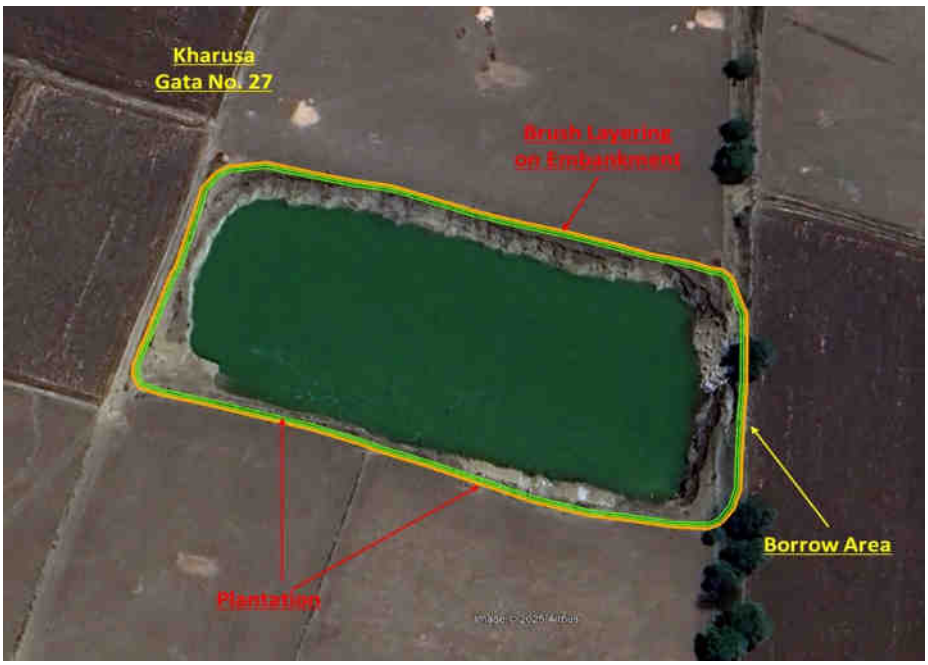
Descriptive View

Digital Elevation Model and Flow Direction

Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan



Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
33.82	1.5	1	0.75	25.37	175	4438.88
32.94	1.5	1	0.75	24.71	175	4323.38
32.43	1.5	1	0.75	24.32	175	4256.44
30.94	1.5	1	0.75	23.21	175	4060.88
32.67	1.5	1	0.75	24.50	175	4287.94
35.32	1.5	1	0.75	26.49	175	4635.75
29.96	1.5	1	0.75	22.47	175	3932.25
34.15	1.5	1	0.75	25.61	175	4482.19
33.56	1.5	1	0.75	25.17	175	4404.75
32.86	1.5	1	0.75	24.65	175	4312.88
27.78	1.5	1	0.75	20.84	175	3646.13
26.36	1.5	1	0.75	19.77	175	3459.75
28.25	1.5	1	0.75	21.19	175	3707.81
Total				308.28	175	53949.00

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	406.29	3263.01	13257.28
Perimeter 2	401.48	3263.01	13100.33
Total			26357.62

3. Brush Layering:

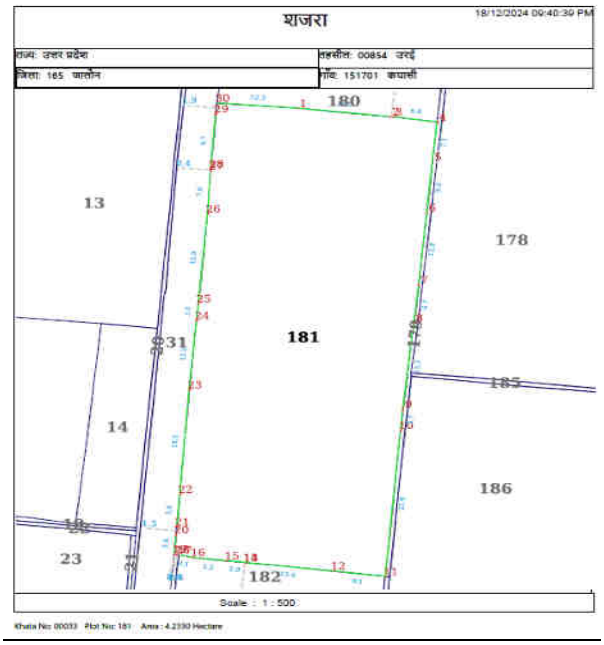
Brush Layering:	Length	Unit Price	Total
Entire Embankment	411.1	142.5	58581.75

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 58581.75/-.

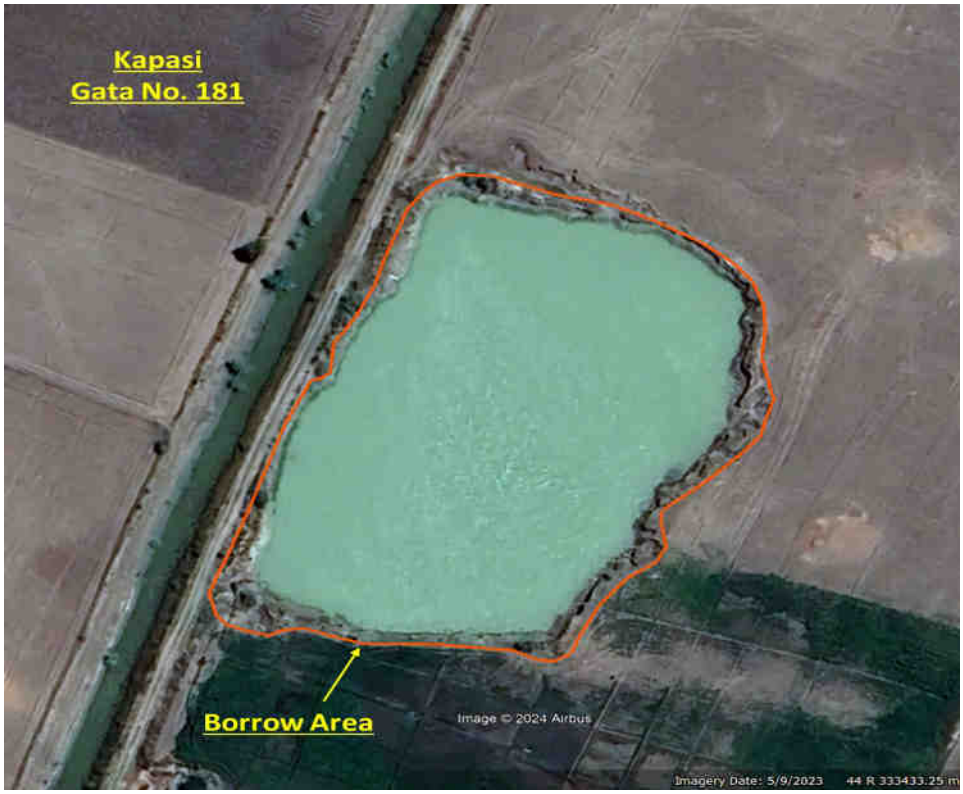
The total cost of remediation plan would be Rs. 138888.37/-.

4a. Kapasi: Gata No. 181 **(**S. No-4 - Notice No - 1932/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 11m soil has been carried out form Gata No. 181. It is having the total plot area as 4.2330 Hectare.



Google Imagery (Date-05/09/2023)



Photographs

Current Situation

The borrow area is situated on east side of road. It is having almost rectangular shape, vegetation and shrubs are almost absent in borrow area and all sides have farm land. The canal is situated on west side, sharing its embankment with the borrow area. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from south to north direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction

Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
31	1.5	1	0.75	23.25	175	4068.75
32	1.5	1	0.75	24	175	4200
30	1.5	1	0.75	22.5	175	3937.5
35	1.5	1	0.75	26.25	175	4593.75
30	1.5	1	0.75	22.5	175	3937.5
29	1.5	1	0.75	21.75	175	3806.25
30	1.5	1	0.75	22.5	175	3937.5
27	1.5	1	0.75	20.25	175	3543.75
29	1.5	1	0.75	21.75	175	3806.25
22	1.5	1	0.75	16.5	175	2887.5
27	1.5	1	0.75	20.25	175	3543.75
Total				241.5	175	42262.5

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	318	3263.01	10376.37
Perimeter 2	307	3263.01	10017.44
Total			20393.81

3. Brush Layering:

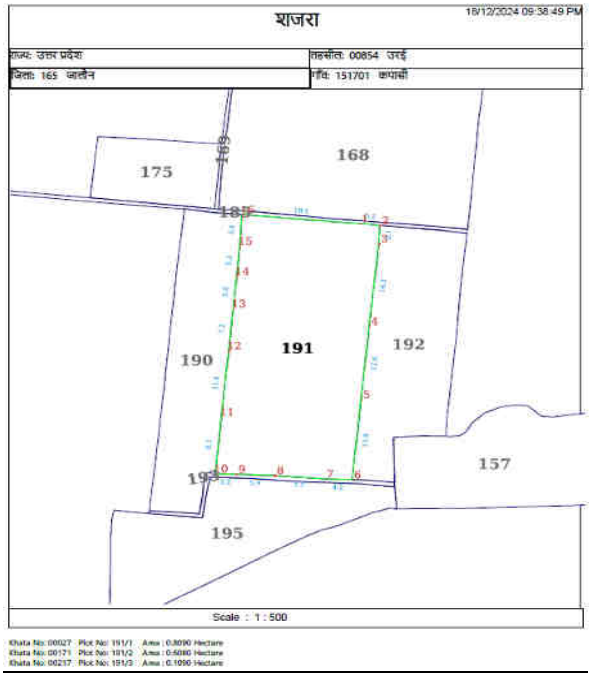
Brush Layering:	Length	Unit Price	Total
Entire Embankment	332	142.5	47310

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 47310/-.

The total cost of remediation plan would be Rs. 109966.31 /-.

4b. Kapasi: Gata No. 191/2 **(**S. No-4 - Notice No - 1932/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 9m soil has been carried out form Gata No. 191/2. It is having the total plot area as 1.5 Hectare.



Google Imagery (Date-05/09/2023)

Photographs

Current Situation

The borrow area is situated on border of village. It is having almost rectangular shape, vegetation and shrubs are almost absent in borrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from south east to north direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction

Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
44	1.5	1	0.75	33	175	5775
45	1.5	1	0.75	33.75	175	5906.25
48	1.5	1	0.75	36	175	6300
40	1.5	1	0.75	30	175	5250
64	1.5	1	0.75	48	175	8400
42	1.5	1	0.75	31.5	175	5512.5
54	1.5	1	0.75	40.5	175	7087.5
37	1.5	1	0.75	27.75	175	4856.25
52	1.5	1	0.75	39	175	6825
71	1.5	1	0.75	53.25	175	9318.75
Total				372.75	175	65231.25

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	493	3263.01	16086.64
Perimeter 2	486	3263.01	15858.23
Total			31944.87

3. Brush Layering:

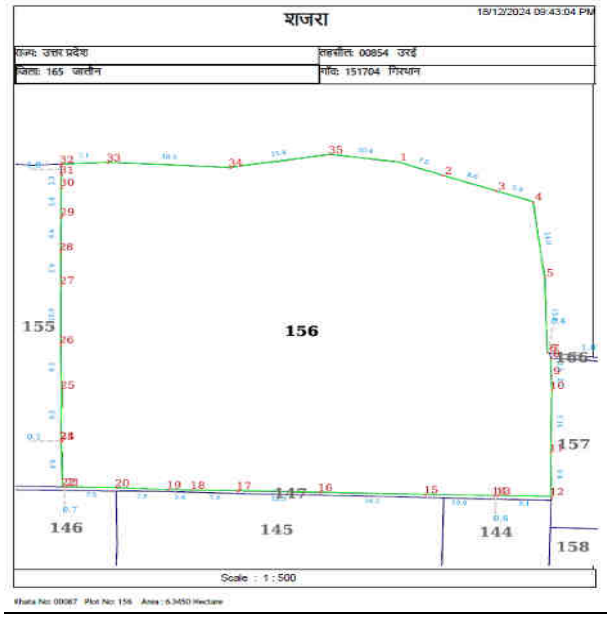
Brush Layering:	Length	Unit Price	Total
Entire Embankment	501	142.5	71392.5

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 71392.5/-.

The total cost of remediation plan would be Rs. 168568.61 /-.

5a. Girthan: Gata No. 156 **(**S. No-5 - Notice No - 1933/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 13 m soil has been carried out form Gata No. 156. It is having the total plot area as 6.3450 Hectare.



Google Imagery (Date-05/09/2023)

Photographs

Current Situation

The borrow area is situated on south direction of village road about 260m. It is having almost rectangular shape, vegetation and shrubs are almost absent in borrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The farm land on the North and South west side of borrow area are observed to be severely eroded with gully formation towards the borrow area. Subsidence of soil along the bunds is visual in North east and south west side of the borrow area which is caused by vertical digging. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from west to east direction, from north to south direction towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction

Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
41.89	1.5	1	0.75	31.4175	175	5498.063
59.22	1.5	1	0.75	44.415	175	7772.625
49.77	1.5	1	0.75	37.3275	175	6532.313
64.76	1.5	1	0.75	48.57	175	8499.75
52.52	1.5	1	0.75	39.39	175	6893.25
62.27	1.5	1	0.75	46.7025	175	8172.938
Total				247.8225	175	43368.94

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	325.57	3263.01	10623.38
Perimeter 2	320.69	3263.01	10464.15
Total			21087.53

3. Check dam/ Brush Layering:

Brush Layering:	Length	Unit Price	Total
Entire Embankment	330.46	142.5	47090.55

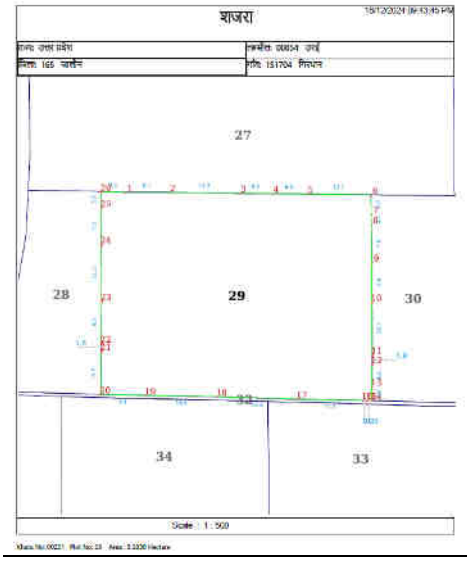
Check Dam	Length	Rate/Unit	Amount (Rs.)
C1	17.3	142.5	2465.25
C2	15.9	142.5	2265.75
Total Cost			4731

As shown in the pictorial view a total of 2 check dams (33.2m)/ brush layers (330.46m) are proposed having a total length of 363.66 meters. Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 51821.55/-.

The total cost of remediation plan would be Rs. 116278.02/-.

5b. Girthan: Gata No. 29**(**S. No-5 - Notice No - 1933/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 13 meters soil has been carried out form Gata No. 29. It is having the total plot area as 3.2830 Hectare.



Google Imagery (Date-05/09/2023)

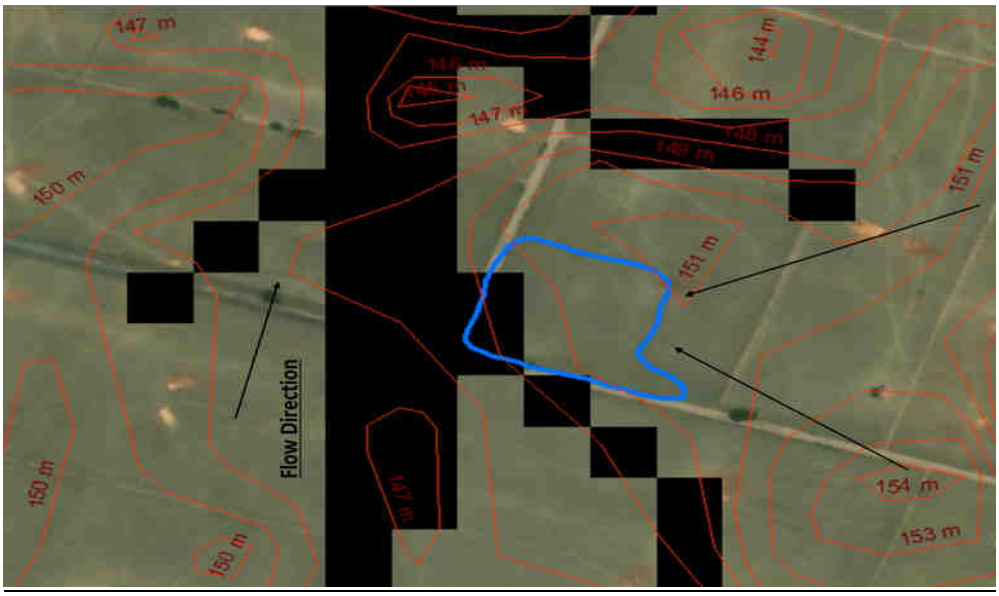
Photographs

Current Situation

The borrow area is situated on north direction of village road sharing border. It is having almost square shape, vegetation and shrubs are lightly present in borrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The farm land on the south east side of borrow area is observed to be severely eroded with gully formation towards the borrow area. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from west to east direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
44.88	1.5	1	0.75	33.66	175	5890.50
43.43	1.5	1	0.75	32.57	175	5700.19
41.59	1.5	1	0.75	31.19	175	5458.69
41.06	1.5	1	0.75	30.80	175	5389.13
72.41	1.5	1	0.75	54.31	175	9503.81
33.74	1.5	1	0.75	25.31	175	4428.38
38.8	1.5	1	0.75	29.10	175	5092.50
Total				236.93	175	41463.19

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	310.84	3263.01	10142.74
Perimeter 2	305.96	3263.01	9983.51
Total			20126.25

3. Check dam/ Brush Layering:

Check Dam	Length	Rate/Unit	Amount (Rs.)
C1	13.6	142.5	1938
C2	19	142.5	2707.5
Total Cost			4645.5

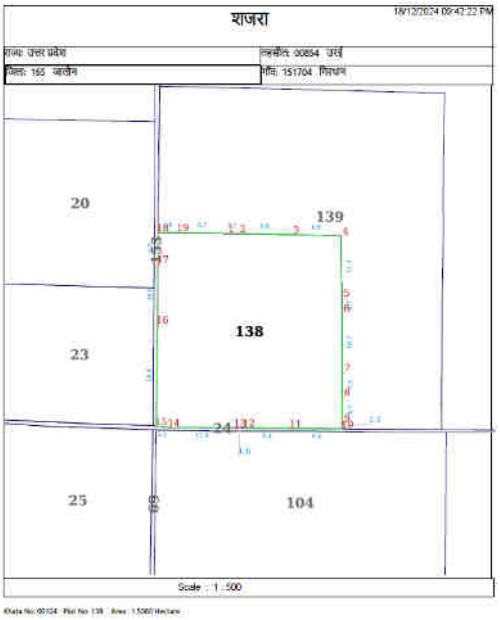
Brush Layering:	Length	Unit Price	Total
Entire Embankment	315.72	142.5	44990.1

As shown in the pictorial view a total of 2 check dams (32.6m)/ brush layers (315.72m) are proposed having a total length of 348.32 meters. Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 49635.6/-.

The total cost of remediation plan would be Rs. 111225.03/-.

5c. Girthan: Gata No. 138**(**S. No-5 - Notice No - 1933/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 13 meters soil has been carried out form Gata No. 138. It is having the total plot area as 1.5060 Hectare.



Google Imagery (Date-05/09/2023)

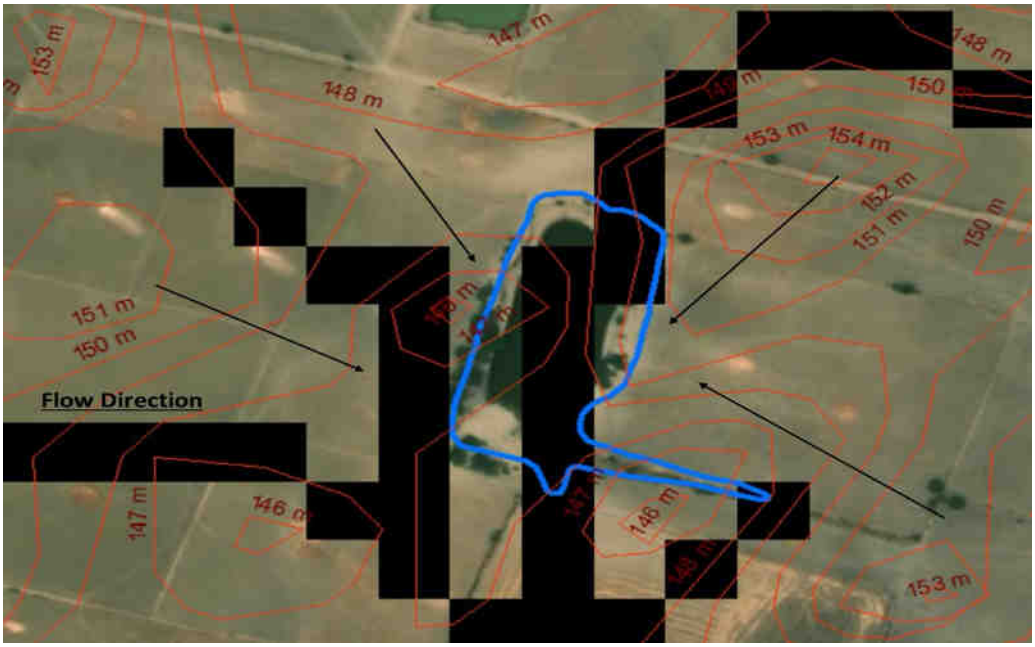
Photographs

Current Situation

The borrow area is situated on south direction of village road about 35m. It is having almost rectangular shape, vegetation and shrubs are lightly present in borrow area with a cover of tree line in west side of burrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The farm land on the south east side of borrow area is observed to be severely eroded with gully formation towards the borrow area. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from east to west direction and towards north to south direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
79.76	1.5	1	0.75	59.82	175	10468.50
78.52	1.5	1	0.75	58.89	175	10305.75
52.56	1.5	1	0.75	39.42	175	6898.50
43.35	1.5	1	0.75	32.51	175	5689.69
52.35	1.5	1	0.75	39.26	175	6870.94
48.98	1.5	1	0.75	36.74	175	6428.63
49.86	1.5	1	0.75	37.40	175	6544.13
51.28	1.5	1	0.75	38.46	175	6730.50
74.23	1.5	1	0.75	55.67	175	9742.69
Total				398.17	175	69679.31

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	525.77	3263.01	17155.93
Perimeter 2	520.39	3263.01	16980.38
Total			34136.31

3. Check dam/ Brush Layering:

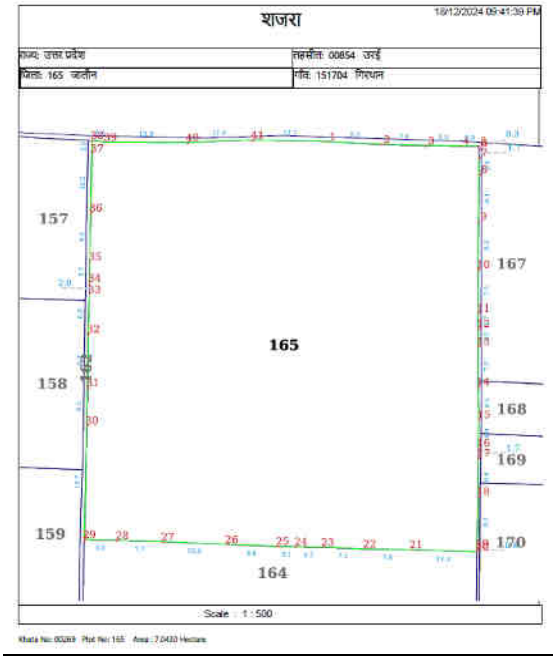
Check Dam	Length	Rate/Unit	Amount (Rs.)
C1	6	142.5	855
C2	8.64	142.5	1231.2
C3	12	142.5	1710
Total Cost			3796.2

Brush Layering:	Length	Unit Price	Total
Entire Embankment	530.92	142.5	75656.1

As shown in the pictorial view a total of 3 check dams (26.64m)/ brush layers (530.92m) are proposed having a total length of 557.56 meters. Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 79452.3/-. The total cost of remediation plan would be Rs. 183267.92/-.

5d. Girthan: Gata No. 165(S. No-5 - Notice No - 1933/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 13 meters soil has been carried out form Gata No. 165. It is having the total plot area as 7.0430 Hectare.



Google Imagery (Date-05/09/2023)

Photographs

Current Situation

The borrow area is situated on west direction of village road. It is having almost rectangular shape, vegetation and shrubs are absent in borrow area. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The farm land on the west and north east side of borrow area is observed with visual subsidence. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from west to east direction and south to north direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction

Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
41.15	1.5	1	0.75	30.86	175	5400.94
57.92	1.5	1	0.75	43.44	175	7602.00
44.15	1.5	1	0.75	33.11	175	5794.69
60.59	1.5	1	0.75	45.44	175	7952.44
76.49	1.5	1	0.75	57.37	175	10039.31
40.96	1.5	1	0.75	30.72	175	5376.00
37.82	1.5	1	0.75	28.37	175	4963.88
50.64	1.5	1	0.75	37.98	175	6646.50
43.8	1.5	1	0.75	32.85	175	5748.75
46.03	1.5	1	0.75	34.52	175	6041.44
48.21	1.5	1	0.75	36.16	175	6327.56
Total				410.82	175	71893.50

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	542.6	3263.01	17705.09
Perimeter 2	537.41	3263.01	17535.74
Total			35240.83

3. Brush Layering:

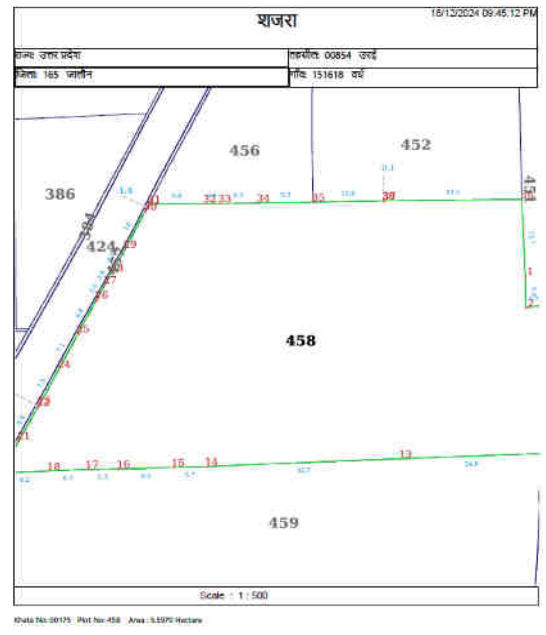
Brush Layering:	Length	Unit Price	Total
Entire Embankment	547.8	142.5	78061.5

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 78061.5/-.

The total cost of remediation plan would be Rs. 185195.83/-.

6. Vardh: Gata No. 458 (S. No-6 - Notice No - 1934/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 10m soil has been carried out form Gata No. 458. It is having the total plot area as 5.5970 Hectare.



Google Imagery (Date-05/09/2023)

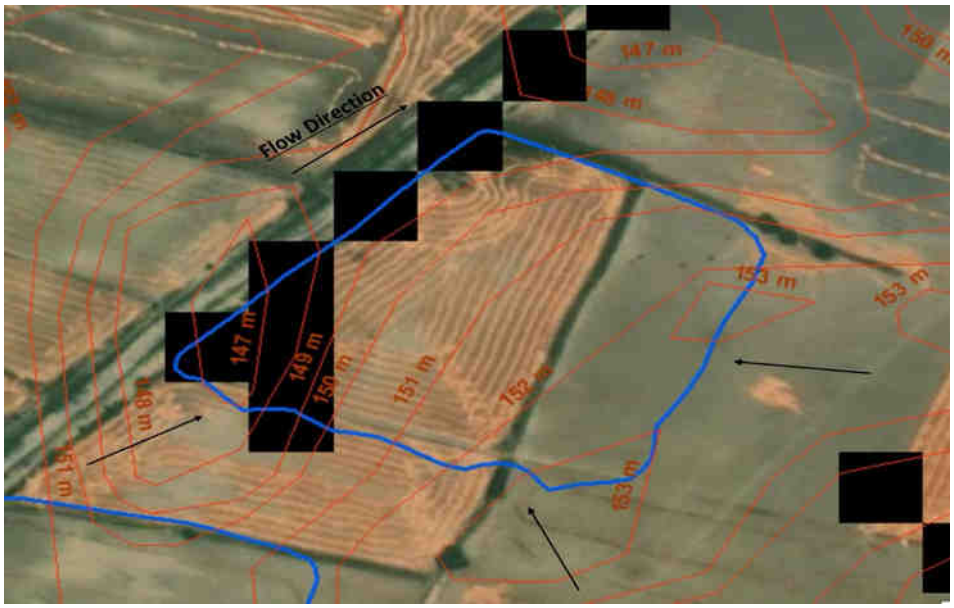
Photographs

Current Situation

The borrow area is situated on east side of road, with canal flowing in west direction. It is having almost trapezoidal shape, vegetation and shrubs are almost absent in borrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from north to south direction, from east to west direction towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
86	1.5	1	0.75	64.5	175	11287.5
71	1.5	1	0.75	53.25	175	9318.75
57	1.5	1	0.75	42.75	175	7481.25
58	1.5	1	0.75	43.5	175	7612.5
56	1.5	1	0.75	42	175	7350
51	1.5	1	0.75	38.25	175	6693.75
65	1.5	1	0.75	48.75	175	8531.25
79	1.5	1	0.75	59.25	175	10368.75
Total				284.25	175	68643.75

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	502	3263.01	16380.31
Perimeter 2	481	3263.01	15695.08
Total			32075.39

3. Brush Layering:

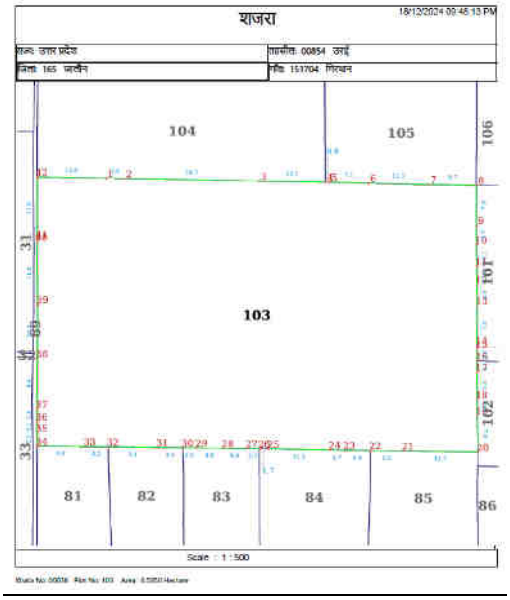
Brush Layering:	Length	Unit Price	Total
Entire Embankment	536	142.5	76380

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 76380/-.

The total cost of remediation plan would be Rs. 177099.13 /-.

7a. Girthan: Gata No. 103**(**S. No-7 - Notice No - 1935/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 3 m soil has been carried out form Gata No. 103. It is having the total plot area as 6.5850 Hectare.



Google Imagery (Date-05/09/2023)

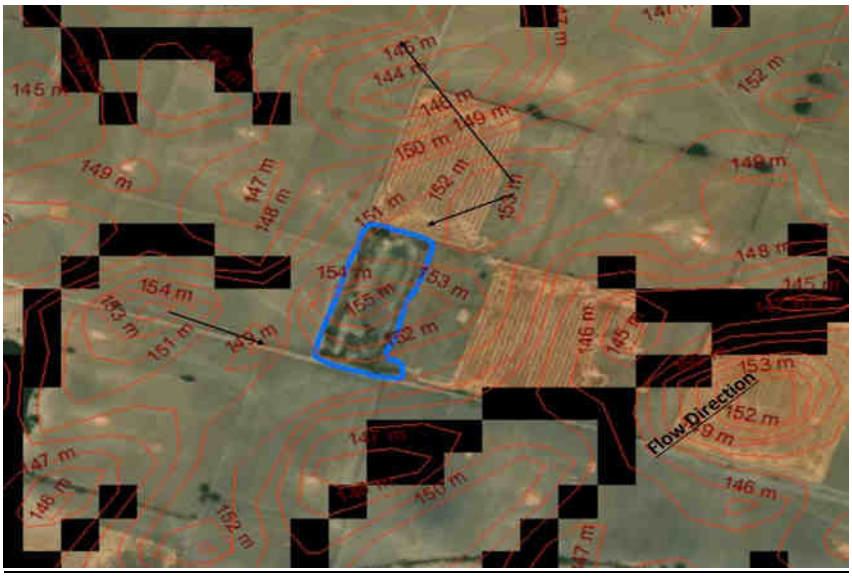
Photographs

Current Situation

The borrow area is situated on north direction of village road sharing border. It is having almost rectangular shape, vegetation and shrubs are lightly present in borrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from North east to south west direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
47.76	1.5	1	0.75	35.82	175	6268.5
61.33	1.5	1	0.75	45.9975	175	8049.563
73.5	1.5	1	0.75	55.125	175	9646.875
64.87	1.5	1	0.75	48.6525	175	8514.188
82.28	1.5	1	0.75	61.71	175	10799.25
57.95	1.5	1	0.75	43.4625	175	7605.938
Total				290.7675	175	50884.31

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	382.76	3263.01	12489.50
Perimeter 2	377.8	3263.01	12327.65
Total			24817.15

3. Brush Layering:

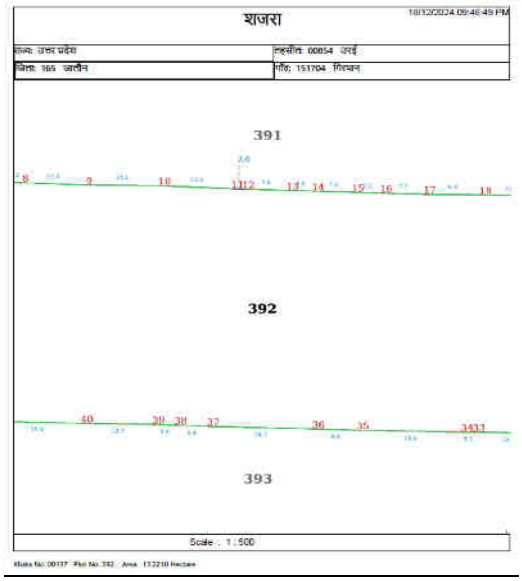
Brush Layering:	Length	Unit Price	Total
Entire Embankment	387.72	142.5	55250.1

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 55250.1/-.

The total cost of remediation plan would be Rs. 130951.56/-.

7b. Girthan: Gata No. 392(S. No-7 - Notice No - 1935/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 8 m soil has been carried out form Gata No. 392. It is having the total plot area is 13.2210 Hectare.



Google Imagery (Date-05/09/2023)

Photographs

Current Situation

The borrow area is situated on south direction of village road sharing border. It is having almost square shape, vegetation and shrubs are absent in borrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The farm land on the North west side of borrow area are observed to be severely eroded with gully formation towards the borrow area. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from east to west direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction

Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
51.02	1.5	1	0.75	38.265	175	6696.375
42.47	1.5	1	0.75	31.8525	175	5574.188
41.43	1.5	1	0.75	31.0725	175	5437.688
51.46	1.5	1	0.75	38.595	175	6754.125
43.15	1.5	1	0.75	32.3625	175	5663.438
75.48	1.5	1	0.75	56.61	175	9906.75
37.41	1.5	1	0.75	28.0575	175	4910.063
52.99	1.5	1	0.75	39.7425	175	6954.938
Total				296.5575	175	51897.56

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	390.5	3263.01	12742.05
Perimeter 2	385.55	3263.01	12580.54
Total			25322.59

3. Check dam/ Brush Layering:

Check Dam	Length	Rate/Unit	Amount (Rs.)
C1	15.8	142.5	2251.5
C2	24	142.5	3420
Total Cost			5671.5

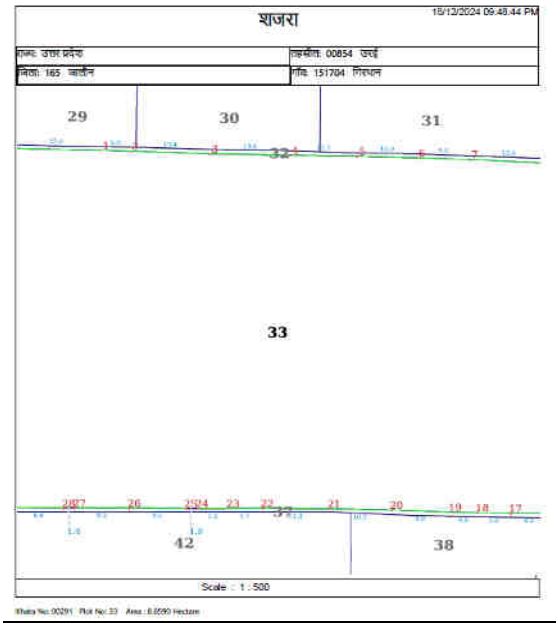
Brush Layering:	Length	Unit Price	Total
Entire Embankment	395.44	142.5	56350.2

As shown in the pictorial view a total of 2 check dams (39.8m)/ brush layers (395.44) are proposed having a total length of 435.24 meters. Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 62021.7/-.

The total cost of remediation plan would be Rs. 139241.85/-.

7c. Girthan: Gata No. 33**(**S. No-7 - Notice No - 1935/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of NIL soil has been carried out form Gata No. 33. It is having the total plot area is 8.8590 Hectare.



Google Imagery (Date-05/09/2023)

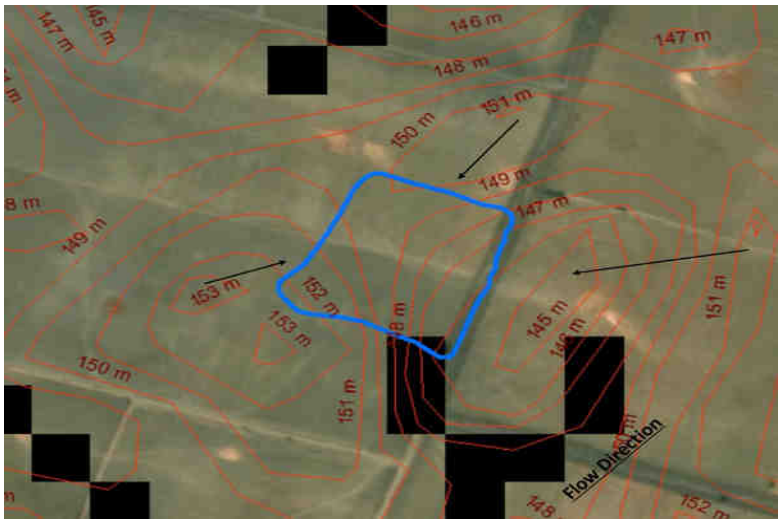
Photographs

Current Situation

The borrow area is situated on west direction of village road sharing border. It is having almost square in shape, vegetation and shrubs are absent in borrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. Visual marks of subsidence are present in all sides specifically towards road. The farm land on the south east and south west side of borrow area are observed to be severely eroded with gully formation towards the borrow area. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from north to south direction and from west to east direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
47.26	1.5	1	0.75	35.45	175	6202.88
48.03	1.5	1	0.75	36.02	175	6303.94
42.36	1.5	1	0.75	31.77	175	5559.75
42	1.5	1	0.75	31.50	175	5512.50
42.48	1.5	1	0.75	31.86	175	5575.50
53.02	1.5	1	0.75	39.77	175	6958.88
43.94	1.5	1	0.75	32.96	175	5767.13
30.88	1.5	1	0.75	23.16	175	4053.00
Total				262.48	175	45933.56

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	345.11	3263.01	11260.97
Perimeter 2	340.21	3263.01	11101.09
Total			22362.06

3. Check dam/ Brush Layering:

Check Dam	Length	Rate/Unit	Amount (Rs.)
C1	25.5	142.5	3633.75
C2	17.7	142.5	2522.25
Total Cost			6156

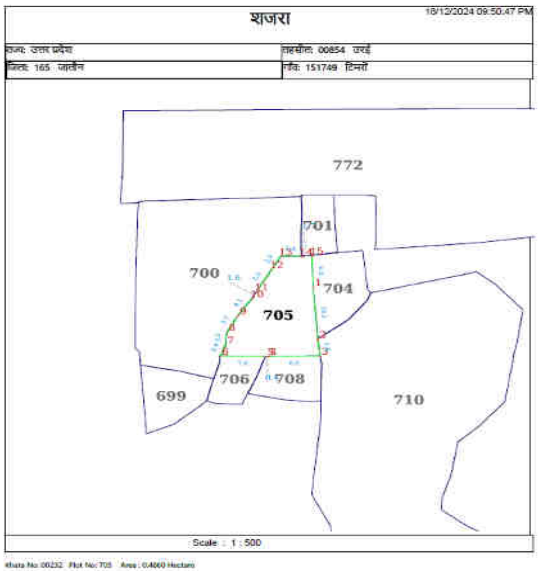
Brush Layering:	Length	Unit Price	Total
Entire Embankment	350.014	142.5	49877.00

As shown in the pictorial view a total of 2 check dams/ brush layers are proposed having a total length of 43.2 meters. Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 56033.00/-.

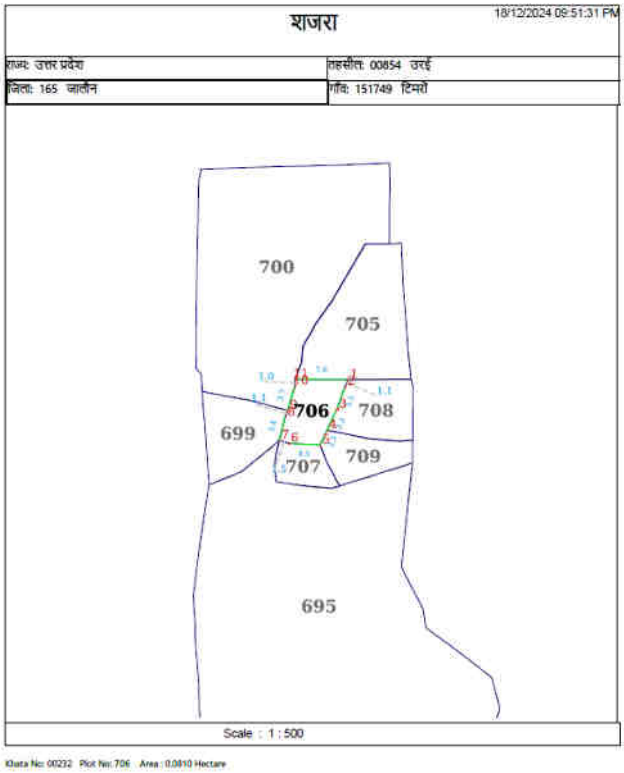
The total cost of remediation plan would be Rs. 124328.62/-.

8 a. to e. Timro: Gata No. 705 **(**S. No. 8a to 8e - Notice No – 1936 to 1940/Khanij-M.M.C.-30 Dated 2/10/2021)

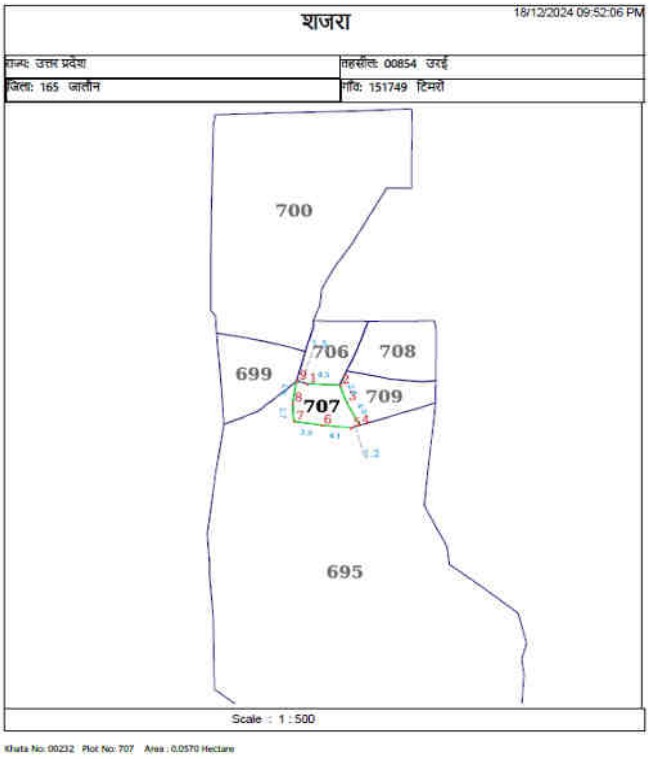
The notice regarding excessive mining of 5 m soil has been carried out form Gata No. 705. It is having the total plot area as 0.4860 Hectare.



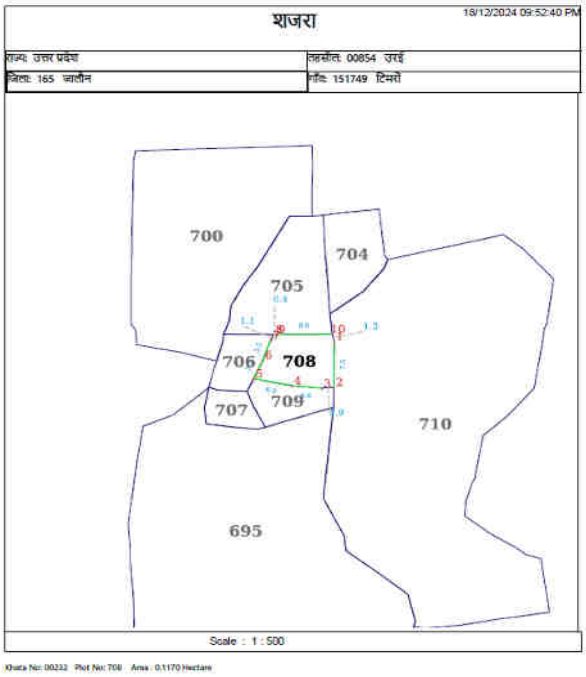
The notice regarding excessive mining of 5 m soil has been carried out form Gata No. 706. It is having the total plot area as 0.0810 Hectare.



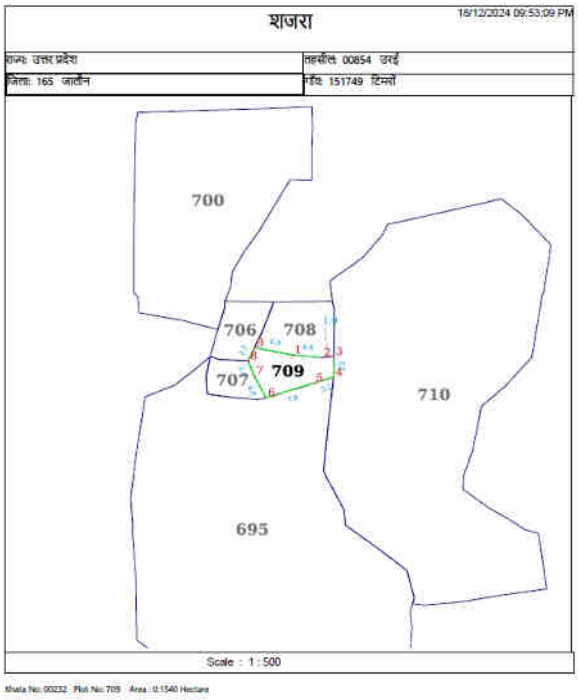
The notice regarding excessive mining of 5 m soil has been carried out form Gata No. 707. It is having the total plot area as 0.0570 Hectare.



The notice regarding excessive mining of 5 m soil has been carried out form Gata No. 708. It is having the total plot area as 0.1170 Hectare.



The notice regarding excessive mining of 5 m soil has been carried out form Gata No. 709. It is having the total plot area as 0.1540 Hectare.



Google Imagery (Date-05/09/2023)

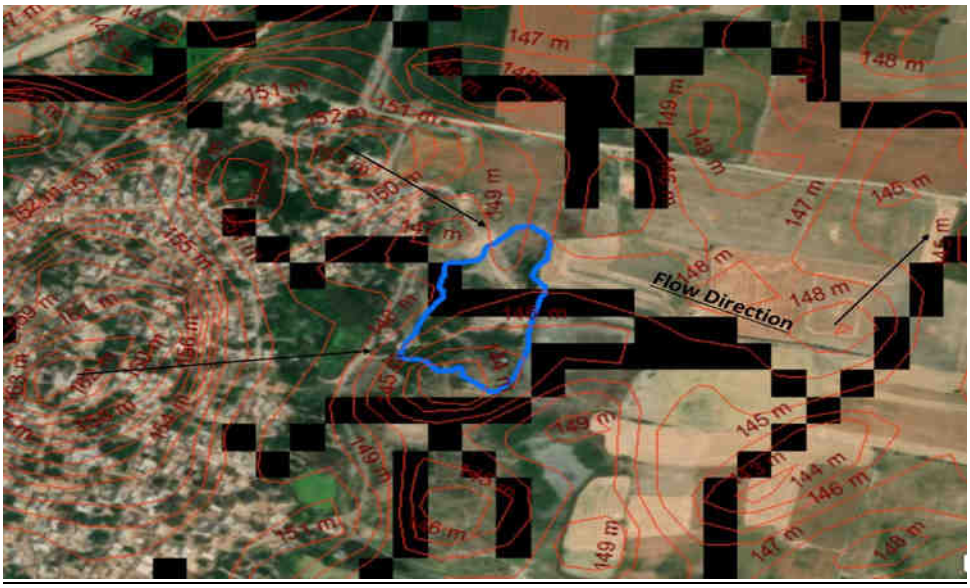
Photographs

Current Situation

The borrow areas is situated on East side of village road. Vegetation and shrubs are present in borrow area and all sides have prevailing tree line. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. With the presence of trees and vegetation only north side of the pond requires remediation measures. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from west to east direction towards the borrow areas.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading, and brush layering afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
49.08	1.5	1	0.75	36.81	175	6441.75
38.94	1.5	1	0.75	29.21	175	5110.88
40.91	1.5	1	0.75	30.68	175	5369.44
65.87	1.5	1	0.75	49.40	175	8645.44
Total				146.10	175	25567.50

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	184	3263.01	6003.94
Perimeter 2	178	3263.01	5808.16
Total			11812.10

3. Brush Layering:

Brush Layering:	Length	Unit Price	Total
Entire Embankment	194.8	142.5	27759

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 27759/-.

The total cost of remediation plan would be Rs. 65138.60/-.

9. Timro: Gata No. 224 **(**S. No-9 - Notice No - 1937/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 8 m soil has been carried out form Gata No. 224. It is having the total plot area as 4.5860 Hectare.

Google Imagery (Date-30/10/2023)

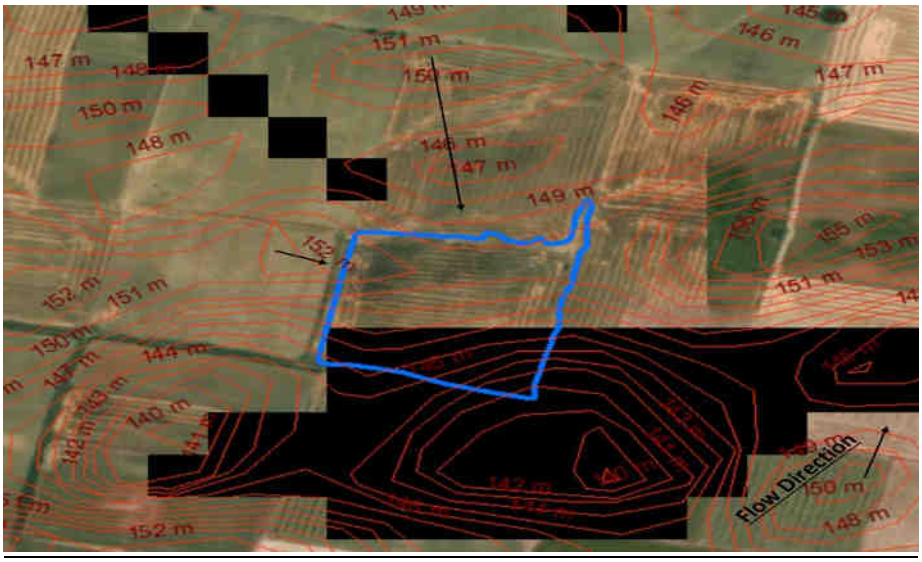
Photographs

Current Situation

The borrow areas is situated on north side of village road sharing border. Vegetation and shrubs are absent in borrow area and all sides have farm lands. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. Visual marks of subsidence in north and south side of borrow area. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from west to east direction, from north to south direction, towards the borrow areas.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

0	1.5	1	0.75	0.00	175	0
49.65	1.5	1	0.75	37.24	175	6516.56
55.46	1.5	1	0.75	41.60	175	7279.13
63.98	1.5	1	0.75	47.99	175	8397.38
85.41	1.5	1	0.75	64.06	175	11210.06
36.03	1.5	1	0.75	27.02	175	4728.94
46.31	1.5	1	0.75	34.73	175	6078.19
50.28	1.5	1	0.75	37.71	175	6599.25
49.58	1.5	1	0.75	37.19	175	6507.38
53.16	1.5	1	0.75	39.87	175	6977.25
Total				367.40	175	64294.13

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	**Perimeter**	**Labour Rate Plantation per 100 meters**	**Total Cost**
Perimeter 1	484.46	3263.01	15807.98
Perimeter 2	478.58	3263.01	15616.11
Total			31424.09

3. Brush Layering:

Brush Layering:	**Length**	**Unit Price**	**Total**
Entire Embankment	489.9	142.5	69810.75

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 69810.75/-.

The total cost of remediation plan would be Rs. 165528.97/-.

10. Timro: Gata No. 605 **(**S. No-10 - Notice No - 1938/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 10 m soil has been carried out form Gata No. 605. It is having the total plot area is 2.1440 Hectare.

Google Imagery (Date-30/10/2023)

Photographs

Current Situation

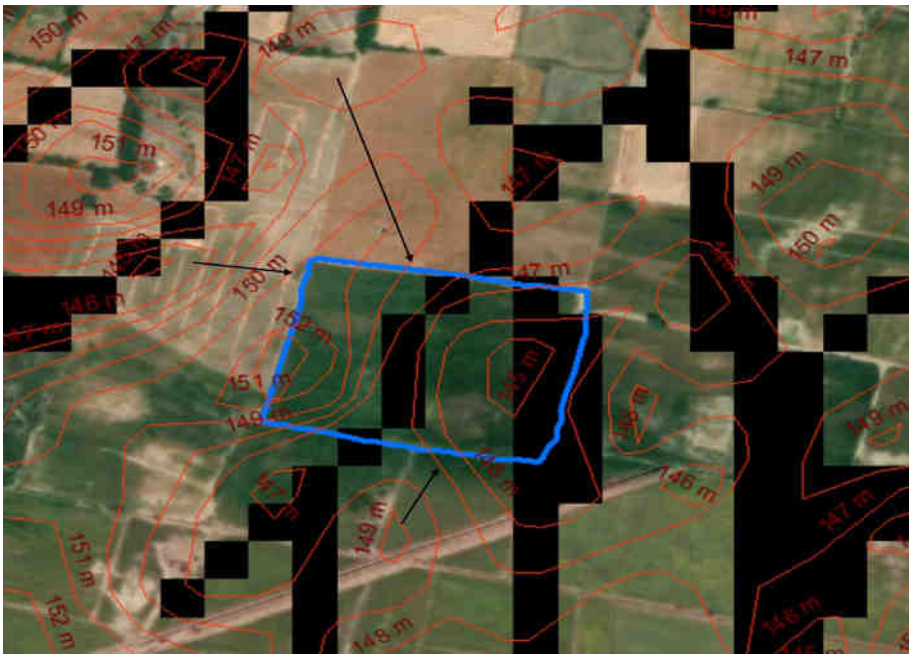
The borrow areas is situated on south side of village road sharing border. Vegetation and shrubs are absent in borrow area and all sides have farm lands.

The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. Visual marks of subsidence in north side of borrow area.

The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from west to east direction, from north to south direction, towards the borrow areas.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
67.6	1.5	1	0.75	50.70	175	8872.50
52.77	1.5	1	0.75	39.58	175	6926.06
49.66	1.5	1	0.75	37.25	175	6517.88
43.57	1.5	1	0.75	32.68	175	5718.56
49.32	1.5	1	0.75	36.99	175	6473.25
55.93	1.5	1	0.75	41.95	175	7340.81
62.7	1.5	1	0.75	47.03	175	8229.38
44.96	1.5	1	0.75	33.72	175	5901.00
46.53	1.5	1	0.75	34.90	175	6107.06
50.43	1.5	1	0.75	37.82	175	6618.94
47.77	1.5	1	0.75	35.83	175	6269.81
61.58	1.5	1	0.75	46.19	175	8082.38
Total				474.62	175	83057.63

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	627.97	3263.01	20490.72
Perimeter 2	623.07	3263.01	20330.84
Total			40821.56

3. Brush Layering:

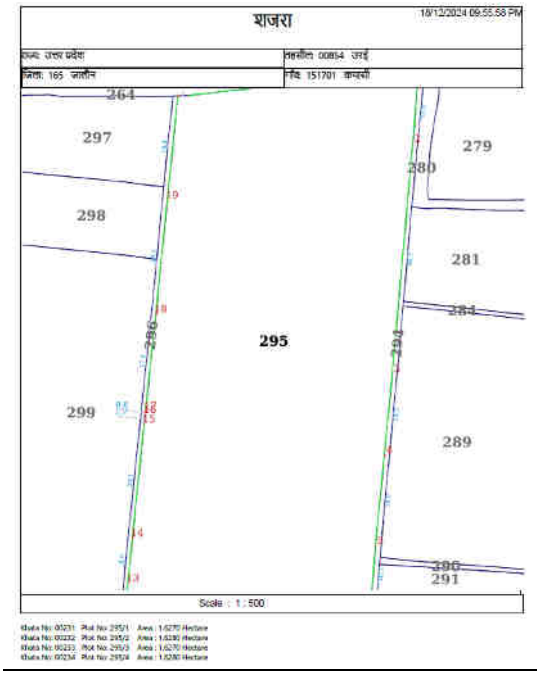
Brush Layering:	Length	Unit Price	Total
Entire Embankment	632.87	142.5	90183.975

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 90183.97/-.

The total cost of remediation plan would be Rs. 214063.16/-.

11. Kapasi: Gata No. 295 **(**S. No-11 - Notice No - 1939/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 12 m soil has been carried out form Gata No. 295. It is having the total plot area as 6.511 Hectare.



Google Imagery (Date-05/09/2023)

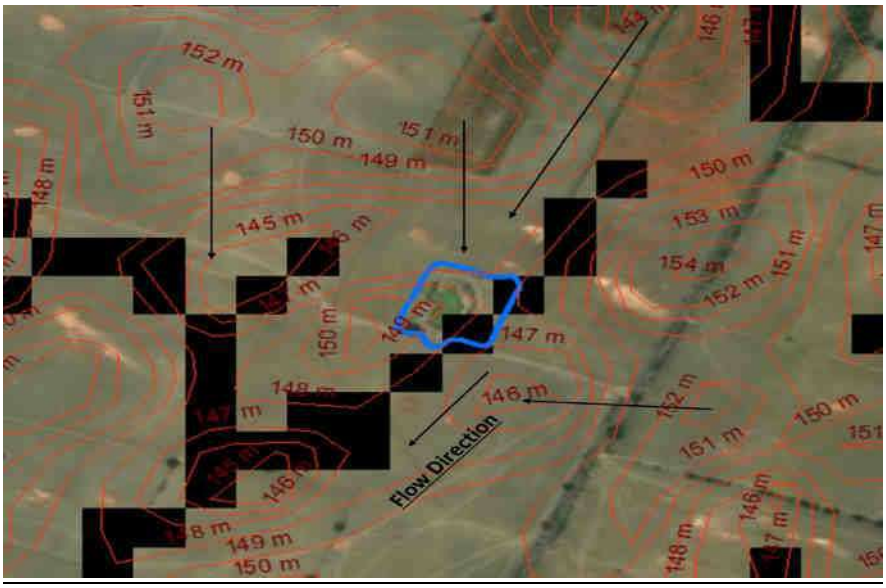
Photographs

Current Situation

The borrow area is situated on west direction of village road. It is having almost rectangular shape, vegetation and shrubs are almost absent in borrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from north to south direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
54	1.5	1	0.75	40.5	175	7087.5
52	1.5	1	0.75	39	175	6825
53	1.5	1	0.75	39.75	175	6956.25
62	1.5	1	0.75	46.5	175	8137.5
Total				165.75	175	29006.25

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	206	3263.01	6721.80
Perimeter 2	194	3263.01	6330.24
Total			13052.04

3. Brush Layering:

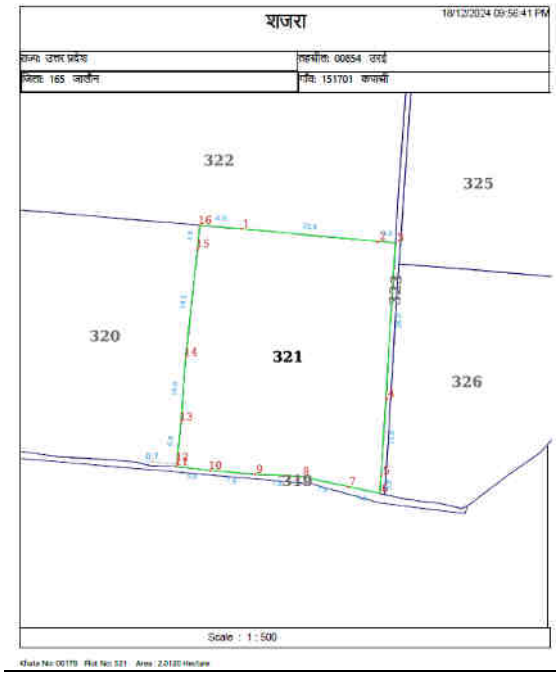
Brush Layering:	Length	Unit Price	Total
Entire Embankment	219	142.5	31207.5

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 31207.5/-.

The total cost of remediation plan would be Rs. 73265.79/-.

12. Kapasi: Gata No. 321 **(**S. No-12 - Notice No - 1940/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 12 m soil has been carried out form Gata No. 321. It is having the total plot area as 2.0120 Hectare.



Google Imagery (Date-05/09/2023)

Photographs

Current Situation

The borrow area is situated on North west direction of road. It is having almost rectangular shape, vegetation and shrubs are almost absent in borrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The farm land on the North east and South east side of borrow area are observed to be severely eroded with gully formation towards the borrow area. Subsidence of soil along the bunds is visual in North east and south west side of the borrow area which is caused by vertical digging. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from west to east direction, from north to south direction towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction

Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
36	1.5	1	0.75	27	175	4725
46	1.5	1	0.75	34.5	175	6037.5
36	1.5	1	0.75	27	175	4725
60	1.5	1	0.75	45	175	7875
60	1.5	1	0.75	45	175	7875
66	1.5	1	0.75	49.5	175	8662.5
Total				228	175	39900

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	289	3263.01	9430.10
Perimeter 2	263	3263.01	8581.72
Total			18011.82

3. Check dam/ Brush Layering:

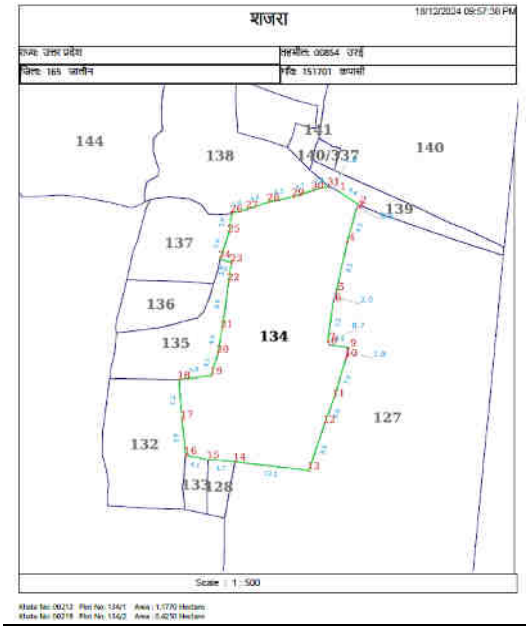
Check Dam	Length	Rate/Unit	Amount (Rs.)
C1	18.9	142.5	2693.25
C2	23.7	142.5	3377.25
C3	10.3	142.5	1467.75
C4	16.5	142.5	2351.25
Total Cost			9889.5

Brush Layering:	Length	Unit Price	Total
Entire Embankment	304	142.5	43320

As shown in the pictorial view a total of 4 check dams (69.4m)/ brush layers (304m) are proposed having a total length 373.4 meters. Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 53209.5/-. The total cost of remediation plan would be Rs. 111121.32/-.

13. Kapasi: Gata No. 134/1 **(**S. No-13 - Notice No - 1941/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 12 m soil has been carried out form Gata No. 134/1. It is having the total plot area as 1.602 Hectare.



Google Imagery (Date-05/09/2023)

Photographs

Current Situation

The borrow area is situated on North direction of village road. It is having almost rectangular shape, vegetation and shrubs on south side of borrow area and rest of the sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from north to south direction, from south west to north east direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction

Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
45	1.5	1	0.75	33.75	175	5906.25
41	1.5	1	0.75	30.75	175	5381.25
50	1.5	1	0.75	37.5	175	6562.5
39	1.5	1	0.75	29.25	175	5118.75
50	1.5	1	0.75	37.5	175	6562.5
27	1.5	1	0.75	20.25	175	3543.75
62	1.5	1	0.75	46.5	175	8137.5
59	1.5	1	0.75	44.25	175	7743.75
44	1.5	1	0.75	33	175	5775
38	1.5	1	0.75	28.5	175	4987.5
40	1.5	1	0.75	30	175	5250
44	1.5	1	0.75	33	175	5775
Total				404.25	175	70743.75

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	477	3263.01	15564.56
Perimeter 2	453	3263.01	14781.44
Total			30345.99

3. Brush Layering:

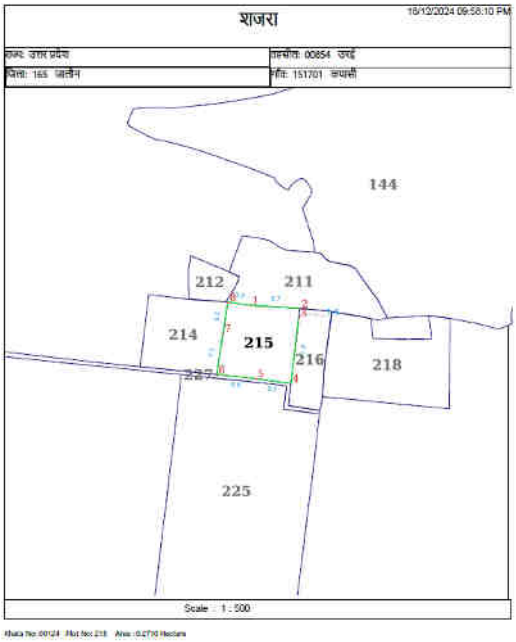
Brush Layering:	Length	Unit Price	Total
Entire Embankment	493	142.5	70252.5

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 70252.5/-.

The total cost of remediation plan would be Rs. 171342.24/-.

14. Kapasi: Gata No. 215 **(**S. No-14 - Notice No - 1942/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 5m soil has been carried out form Gata No. 215. It is having the total plot area as 0.2710 Hectare.



Google Imagery (Date-05/09/2023)

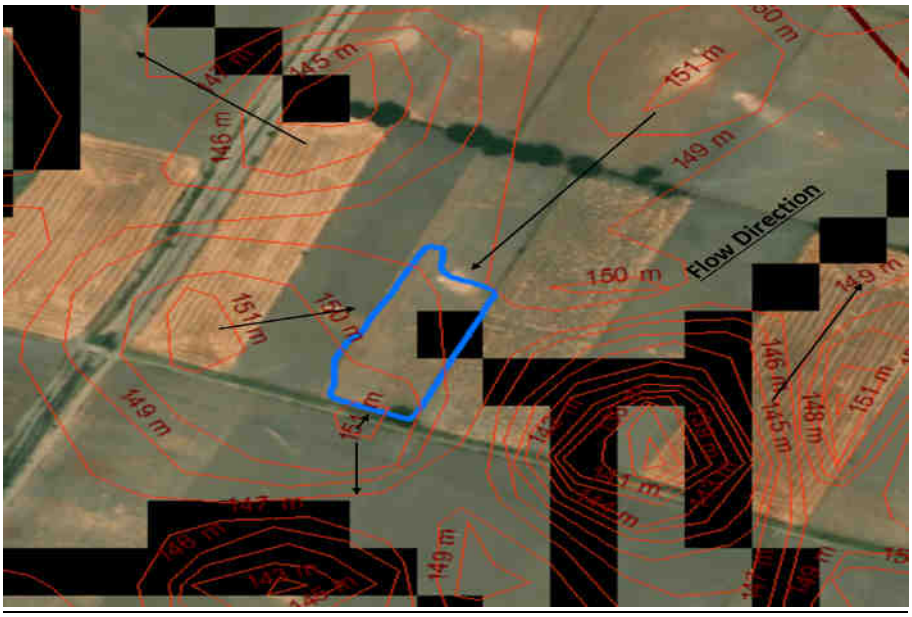
Photographs

Current Situation

The borrow area is situated on North west direction of village road. It is having almost rectangular shape, vegetation and shrubs are almost absent in borrow area and all sides have farm land. The canal is situated in west direction. The borrow area is situated in the proximity of almost 170m of Bundelkhand expressway. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from north to south direction, from west to east direction towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
24	1.5	1	0.75	18	175	3150
35	1.5	1	0.75	26.25	175	4593.75
33	1.5	1	0.75	24.75	175	4331.25
46	1.5	1	0.75	34.5	175	6037.5
39	1.5	1	0.75	29.25	175	5118.75
35	1.5	1	0.75	26.25	175	4593.75
32	1.5	1	0.75	24	175	4200
35	1.5	1	0.75	26.25	175	4593.75
Total				209.25	175	36618.75

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	272	3263.01	8875.39
Perimeter 2	266	3263.01	8679.61
Total			17554.99

3. Brush Layering:

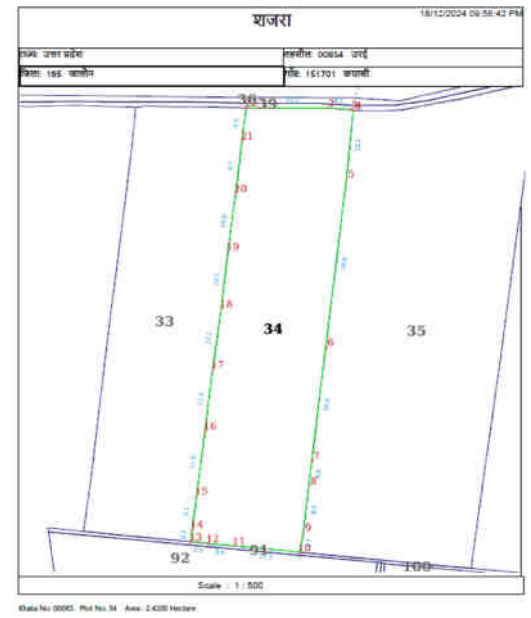
Brush Layering:	Length	Unit Price	Total
Entire Embankment	281	142.5	40042.5

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 40042.5/-.

The total cost of remediation plan would be Rs. 94216.24/-.

15. Kapasi: Gata No. 34 **(**S. No-15 - Notice No - 1943/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 1m soil has been carried out form Gata No. 34. It is having the total plot area is 2.4200 Hectare.



Google Imagery (Date-05/09/2023)

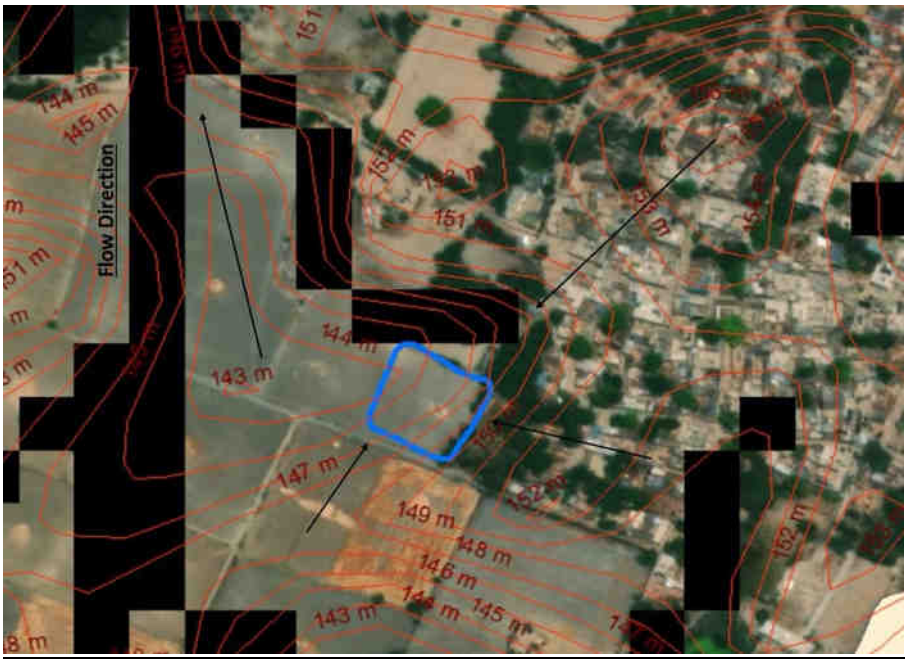
Photographs

Current Situation

The borrow area is situated on North direction of village road sharing border with road. It is having almost rectangular shape, vegetation and shrubs are on east and north sides and rest of the sides have farm land. It is situated very near to village. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from north east to south west, from south to north and also from east to west direction, towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
23	1.5	1	0.75	17.25	175	3018.75
25	1.5	1	0.75	18.75	175	3281.25
25	1.5	1	0.75	18.75	175	3281.25
26	1.5	1	0.75	19.5	175	3412.5
25	1.5	1	0.75	18.75	175	3281.25
25	1.5	1	0.75	18.75	175	3281.25
24	1.5	1	0.75	18	175	3150
Total				129.75	175	22706.25

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	186	3263.01	6069.20
Perimeter 2	178	3263.01	5808.16
Total			11877.36

3. Brush Layering:

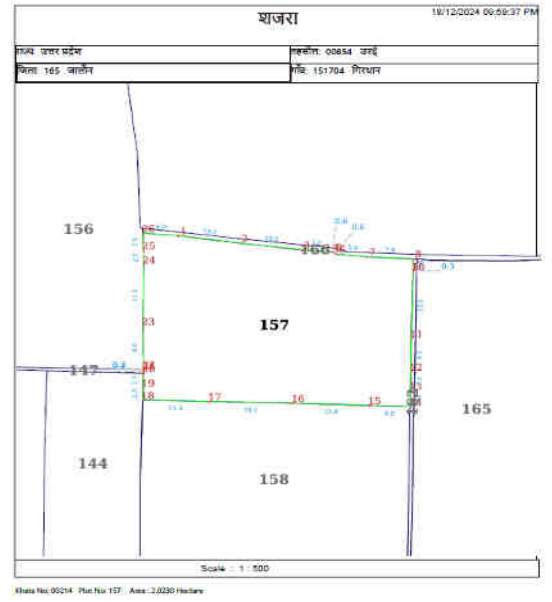
Brush Layering:	Length	Unit Price	Total
Entire Embankment	194	142.5	27645

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 27645/-.

The total cost of remediation plan would be Rs. 62228.60 /-.

16. Girthan: Gata No. 157 **(**S. No-16 - Notice No - 1944/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 15 m soil has been carried out form Gata No. 157. It is having the total plot area as 2.0230 Hectare.



Google Imagery (Date-05/09/2023)

Photographs

Current Situation

The borrow area is situated on south direction of village road about 425m. It is having almost rectangular shape, vegetation and shrubs are almost absent in borrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. Subsidence of soil along the bunds is visual in all sides of the borrow area which is caused by vertical digging. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from west to east direction, from south to north direction towards the borrow area.

Descriptive View

Digital Elevation Model and Flow Direction

Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layer, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
40.2	1.5	1	0.75	30.15	175	5276.25
52.84	1.5	1	0.75	39.63	175	6935.25
41.53	1.5	1	0.75	31.1475	175	5450.813
36.98	1.5	1	0.75	27.735	175	4853.625
39.71	1.5	1	0.75	29.7825	175	5211.938
31.32	1.5	1	0.75	23.49	175	4110.75
35.23	1.5	1	0.75	26.4225	175	4623.938
Total				208.3575	175	36462.56

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	272.78	3263.01	8900.84
Perimeter 2	266.49	3263.01	8695.60
Total			17596.43

3. Brush Layering:

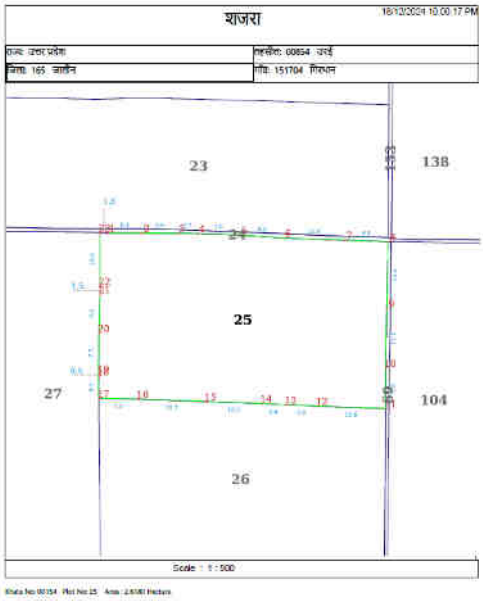
Brush Layering:	Length	Unit Price	Total
Entire Embankment	277.84	142.5	39592.2

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 39592.2/-.

The total cost of remediation plan would be Rs. 93651.20/-.

17. Girthan: Gata No. 25**(**S.No-17 - Notice No - 1945/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 15m soil has been carried out form Gata No. 25. It is having the total plot area as 2.6180 Hectare.



Google Imagery (Date-05/09/2023)

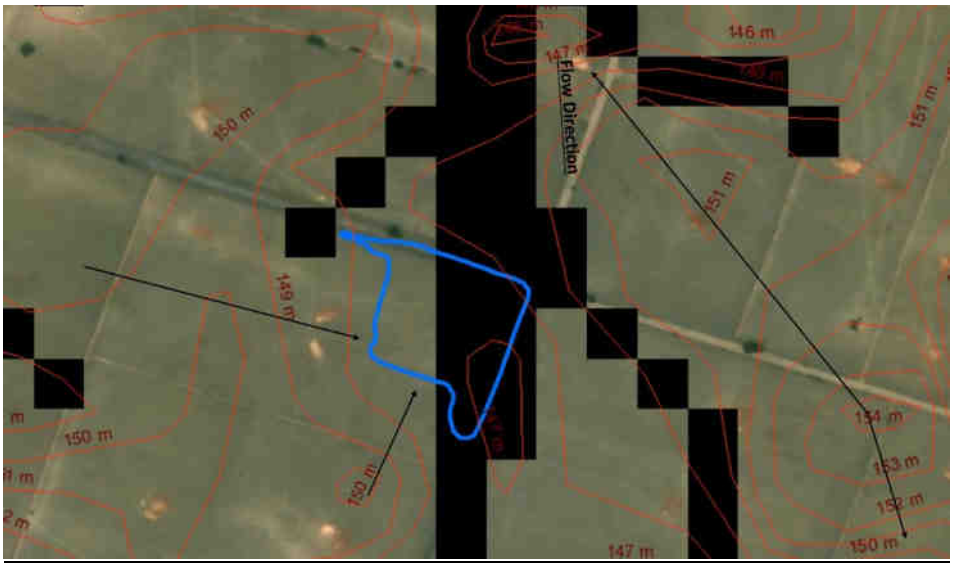
Photographs

Current Situation

The borrow area is situated on south direction of village road sharing border. It is having almost square in shape, vegetation and shrubs are lightly present in borrow area and all sides have farm land. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The farm land on the North west and south side of borrow area are observed to be severely eroded with gully formation towards the borrow area. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from south to north direction and from west to east direction, towards the borrow area.

Descriptive View

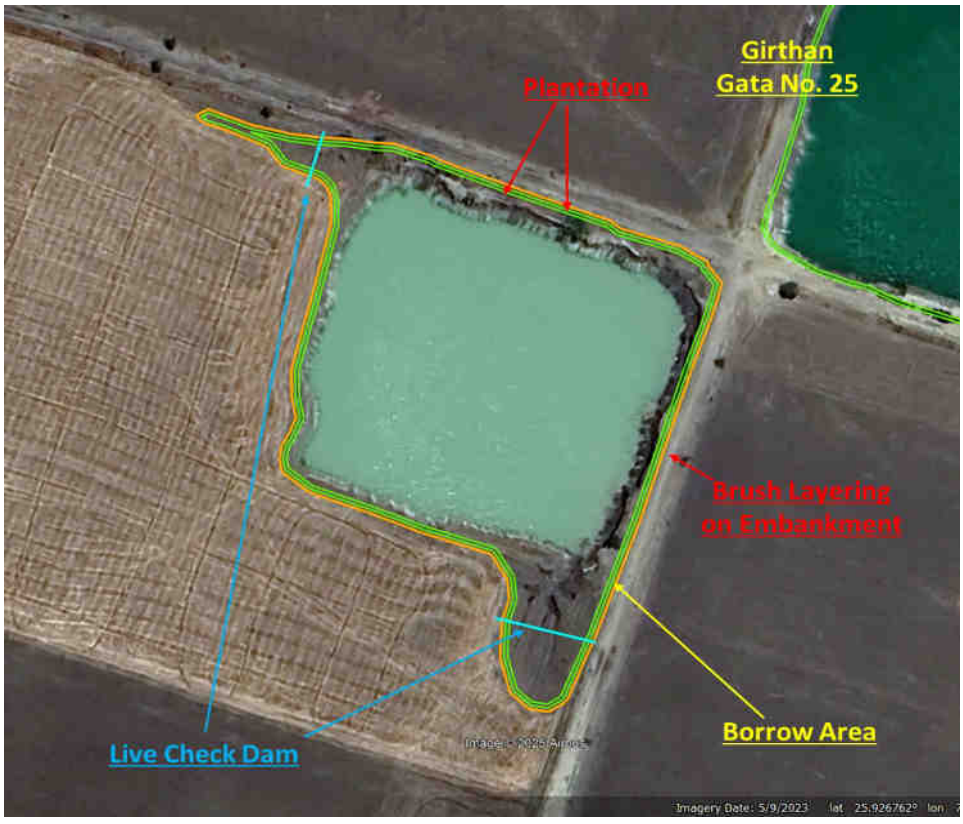
Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan



Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
78.31	1.5	1	0.75	58.73	175	10278.19
62.02	1.5	1	0.75	46.52	175	8140.13
97.32	1.5	1	0.75	72.99	175	12773.25
53.45	1.5	1	0.75	40.09	175	7015.31
45.33	1.5	1	0.75	34.00	175	5949.56
51.7	1.5	1	0.75	38.78	175	6785.63
Total				291.10	175	50942.06

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	382.53	3263.01	12481.99
Perimeter 2	358.97	3263.01	11713.23
Total			24195.22

3. Check dam/ Brush Layering:

Check Dam	Length	Rate/Unit	Amount (Rs.)
C1	12	142.5	1710
C2	20.9	142.5	2978.25
Total Cost			4688.25

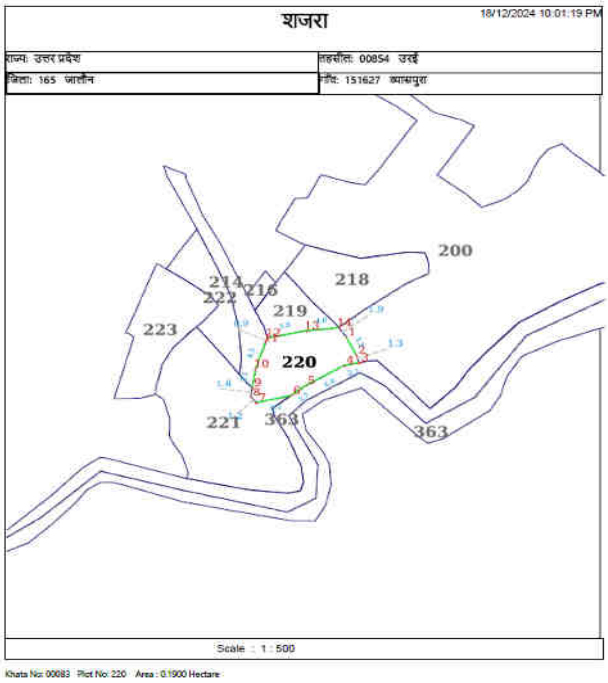
Brush Layering:	Length	Unit Price	Total
Entire Embankment	388.15	142.5	55311.375

As shown in the pictorial view a total of 2 check dams (32.9m)/ brush layers (388.15m) are proposed having a total length of 421.05 meters. Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 59999.63/-.

The total cost of remediation plan would be Rs. 135136.91/-.

18. Vyaspura: Gata No. 220 (S. No-18 - Notice No - 1946/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice states excessive mining of 3m soil has been carried out form Gata No. 220. It is having the total plot area as 0.1900 Hectare.



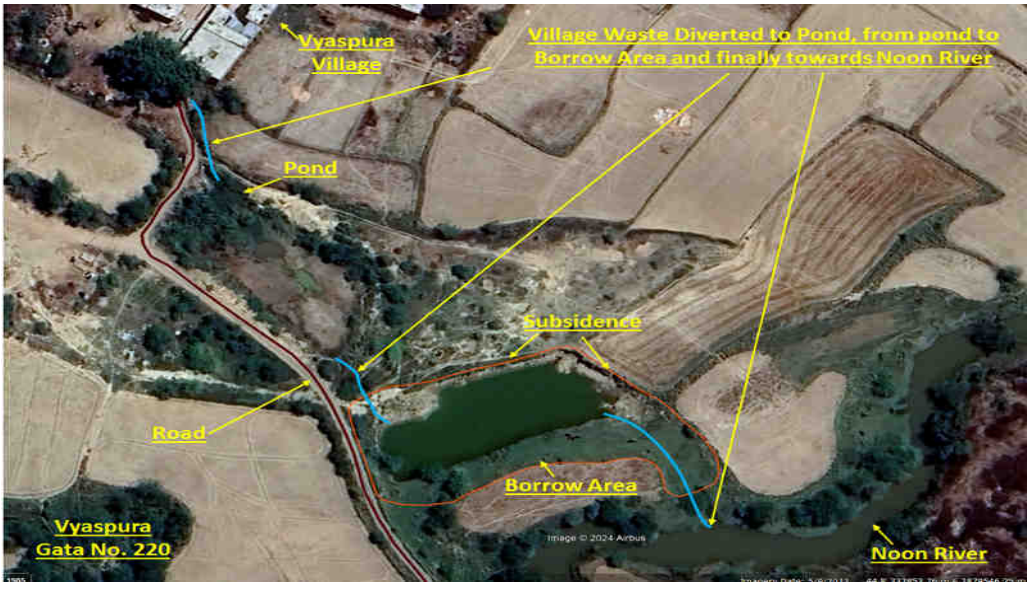
Google Imagery 5/9/23

Photographs

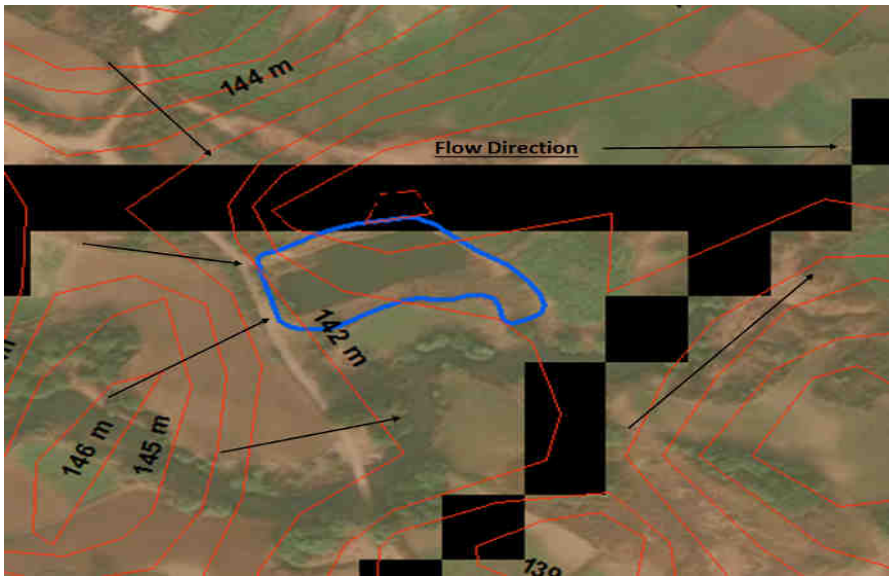
Current Situation

The borrow area is situated on east direction of village road. It is having almost rectangular shape. Vegetation and shrubs are on the west side bordering between village road and borrow area whereas on the rest sides farm land are seen. The Noon River is situated in south direction about 20 m from the burrow area, flowing in the direction from west to east. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done on all sides of borrow area thereby creating a pond. The water is further used for irrigation and fish farming. The farm land on the east and north side of burrow area is observed to be unstable owing to topographical features. It is also observed that the waste water from village is first entering the pond in the north side of borrow area and then flows towards the borrow area and then further in to the noon river. The spatial data pertaining all basic information are assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicates that the flow is slightly from north west to south east direction, from east to west direction towards the borrow area.

Descriptive View



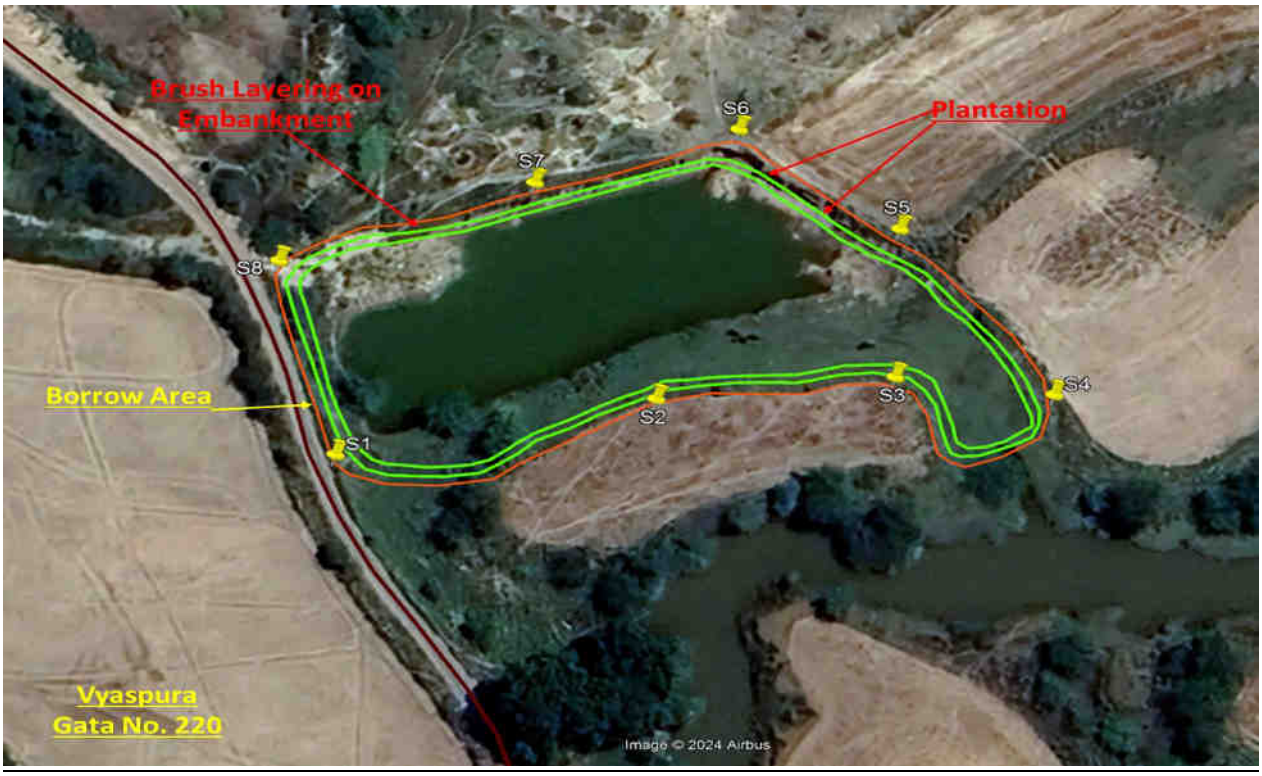
Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is first to be conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan



Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
44	1.5	1	0.75	33	175	5775
30	1.5	1	0.75	22.5	175	3937.5
34	1.5	1	0.75	25.5	175	4462.5
33	1.5	1	0.75	24.75	175	4331.25
25	1.5	1	0.75	18.75	175	3281.25
27	1.5	1	0.75	20.25	175	3543.75
35	1.5	1	0.75	26.25	175	4593.75
30	1.5	1	0.75	22.5	175	3937.5
Total				144.75	175	25331.25

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	248	3263.01	8092.26
Perimeter 2	240	3263.01	7831.22
Total			15923.48

3. Brush Layering:

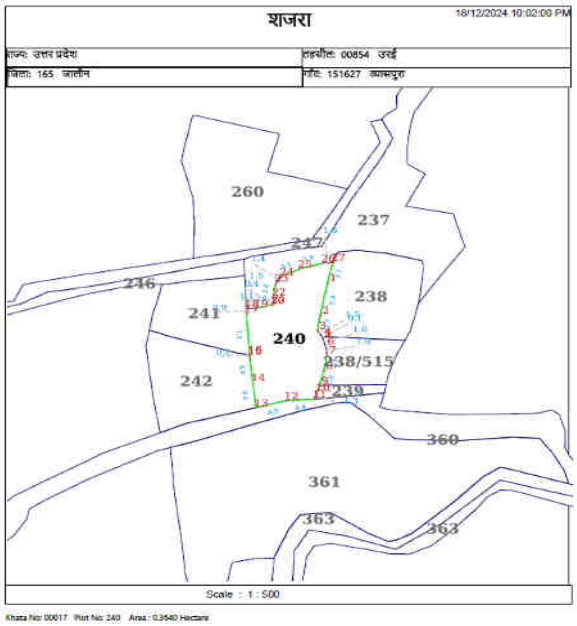
Brush Layering:	Length	Unit Price	Total
Entire Embankment	258	142.5	36765

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 36765/-.

The total cost of remediation plan would be Rs. 78019.73 /-.

19. **Vyaspura**: Gata No. 240 (S. No-19 - Notice No - 1947/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice states that excessive mining of 3m soil has been carried out form Gata No. 240. It is having the total plot area is 0.3640 Hectare.



Google Imagery 5/9/2023

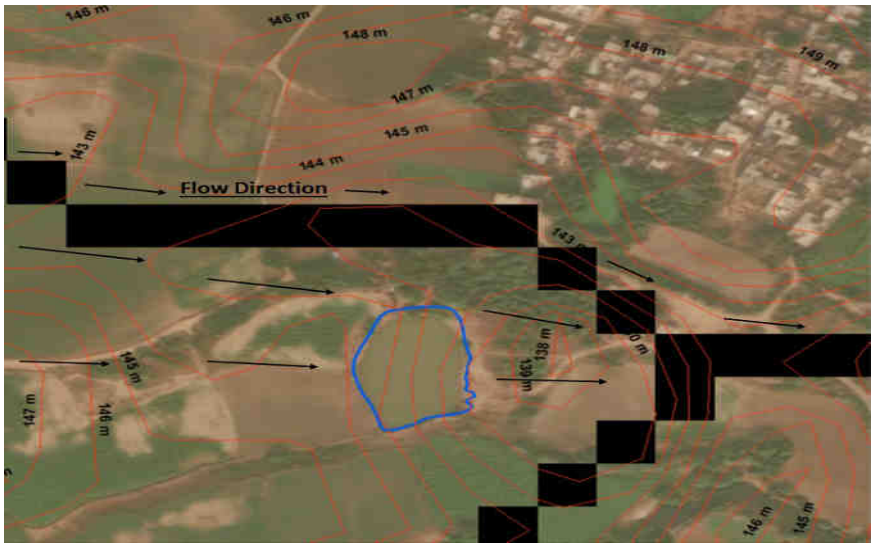
Photographs

Current Situation

During the field visit it has been observed that the borrow area is situated about 30 to 40m from the village road. It is having almost rectangular shape, vegetation and shrubs on the north east side are seen whereas on the other sides farm land are present. The Noon River is situated in south direction about 100 m from the borrow area, flowing in the direction from west to east. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation and fish farming, as generator, pipes and fishing materials are also observed near the borrow area. The farm land on the North west to South west side of borrow area are observed to be severely eroded with gully formation towards the borrow area, visual marks of severe base flow is also observed. Subsidence of soil along the bunds is visual in south east and south side of the borrow area which is caused by vertical digging and as a result of base flow. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicates that the flow is slightly from north west to south east direction towards the borrow area. As no vegetation cover in farms on south and west direction, it causes severe damage to farm fields.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is first to be conserved with Slope Grading. Afterwards plantation is proposed down the slope with 2 consecutive rows of grass plantation down the slope with vertical distance of 750mm. For the treatment of Gully Erosion, live check dams/ brush layering is proposed to be constructed with spacing of 1 to 1.5 meters in the entire affected area. For preventing any mishap such as threat to animals/children from falling into the pond apart from providing additional strength to the embankment around the pond, it is proposed that all along the periphery of the pond, outside the grass plantation, brush layering be carried out.

Pictorial View of Remediation Plan

Cost analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
43	1.5	1	0.75	32.25	175	5643.75
45	1.5	1	0.75	33.75	175	5906.25
38	1.5	1	0.75	28.5	175	4987.5
33	1.5	1	0.75	24.75	175	4331.25
41	1.5	1	0.75	30.75	175	5381.25
45	1.5	1	0.75	33.75	175	5906.25
Total				183.75	175	32156.25

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	228	3263.01	7439.66
Perimeter 2	218	3263.01	7113.36
Total			14553.02

3. Brush Layering:

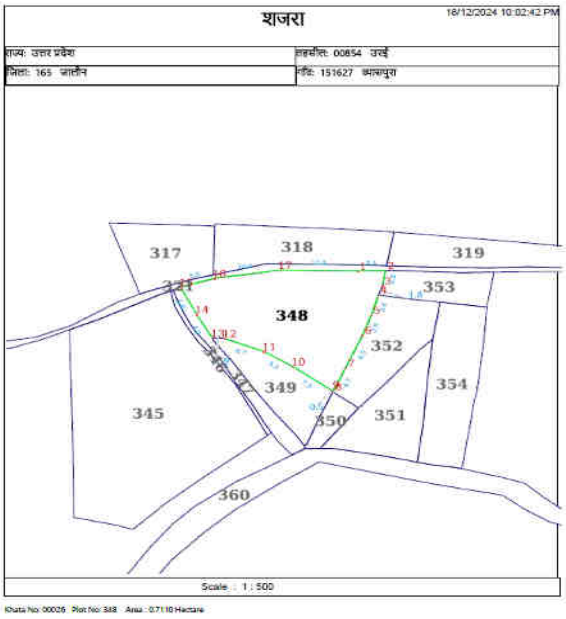
Brush Layering:	Length	Unit Price	Total
Entire Embankment	244	142.5	34770

As shown in the pictorial view a total of 8 check dams (14m)/ brush layers (230m) are proposed having a total length of 244 meters. Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 34770/-.

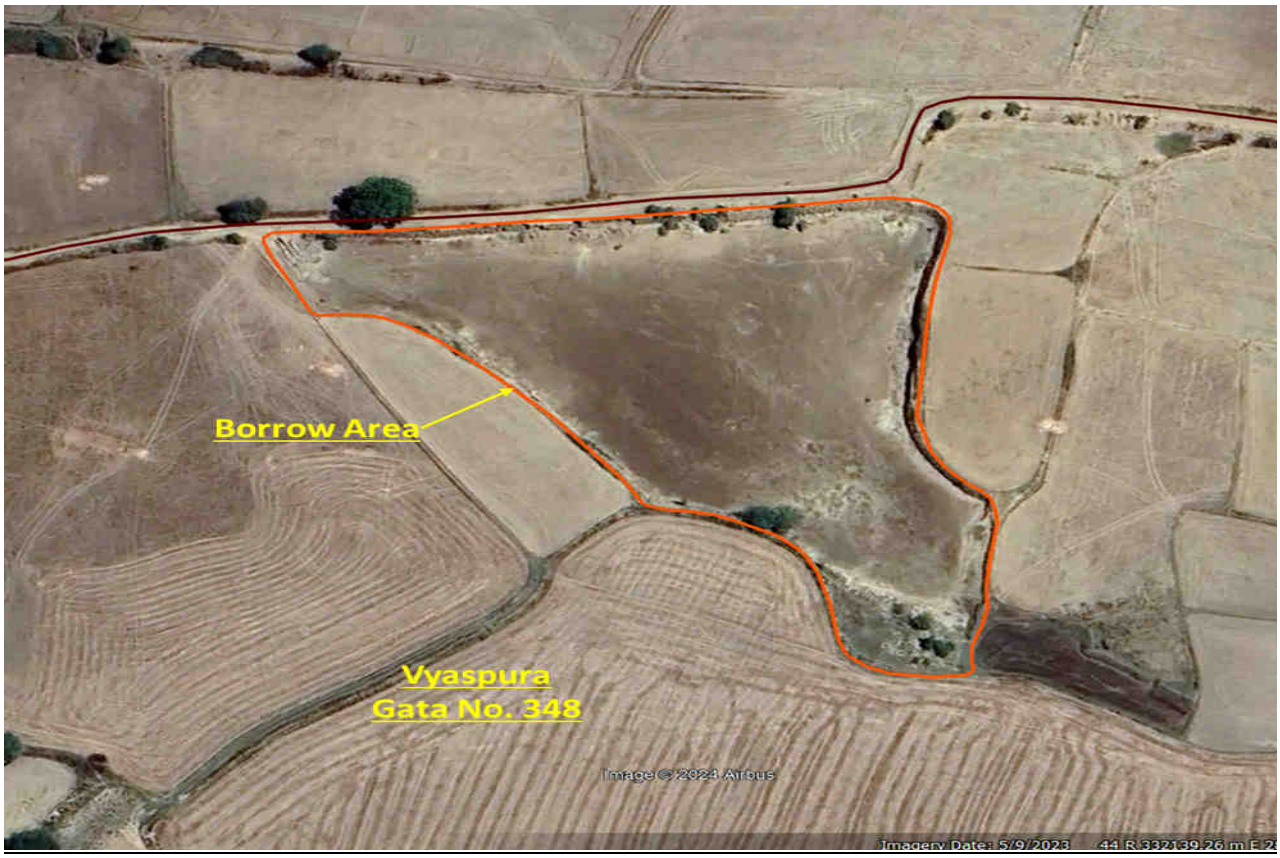
The total cost of remediation plan would be Rs. 95135.04 /-.

20. **Vyaspura:** Gata No. 348 **(**S. No-20 - Notice No - 1948/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice states excessive mining of 3m soil form Gata No. 348. It is having the total plot area as 0.7110 Hectare.



Google Imagery 5/9/2023

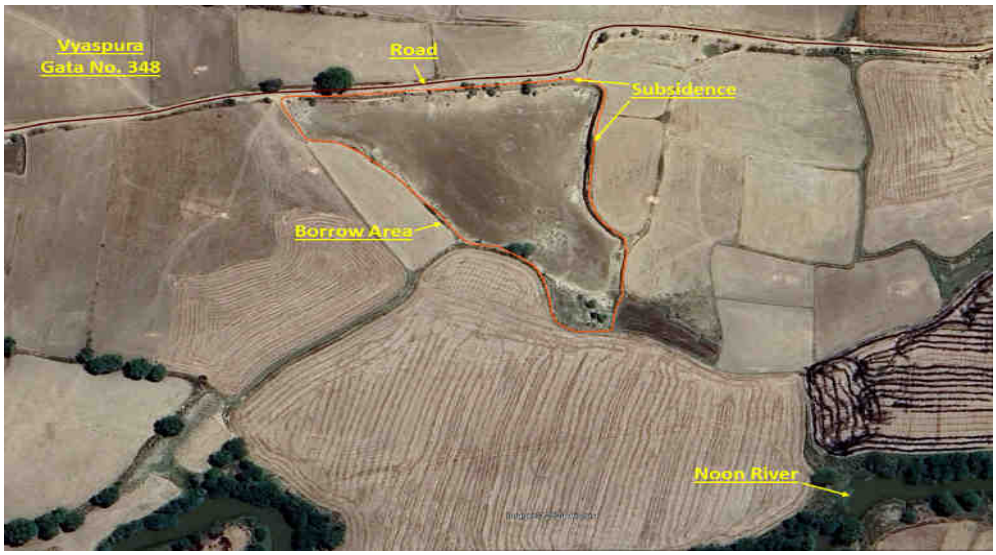


Photographs

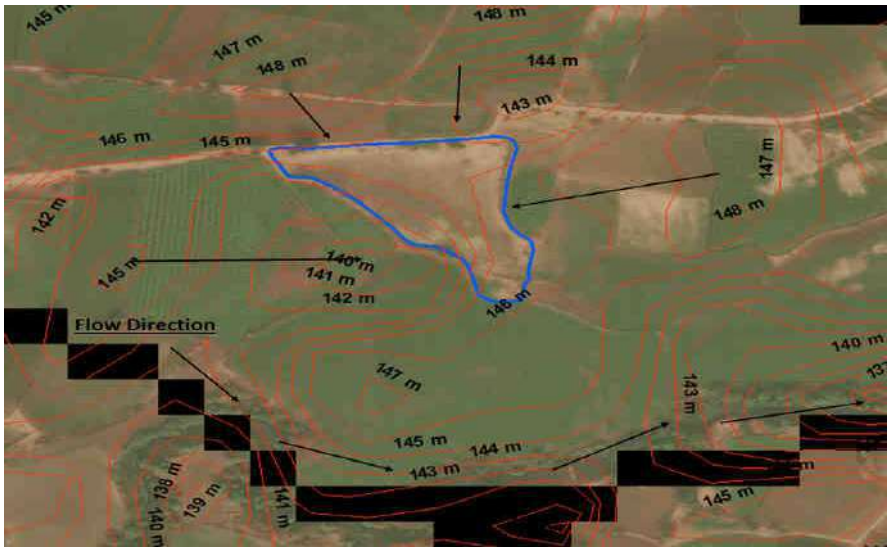
Current Situation

The borrow area is situated on south direction of village road. It is having almost triangle shape and no vegetation and shrubs were seen on the north side whereas on rest of the side farm land are seen. The Noon River is situated in south direction about 125 m from the borrow area, flowing in the direction from west to east. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done on all sides of borrow area thereby creating a pond. The water is further used for irrigation and fish farming. The farm land on the west, east and South side of borrow area is observed to be unstable, especially in the north side adjacent to road. Subsidence of soil along the bunds is visual in all side of the borrow area which is caused by vertical digging and as a result of base flow. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model was developed, and contours have been generated to understand flow direction, which indicated that the flow is slightly from north to south direction, from west to south east direction and also from North east to south west towards the borrow area. As no vegetation cover in farms on either direction, it causes damage to farm fields.

Descriptive View



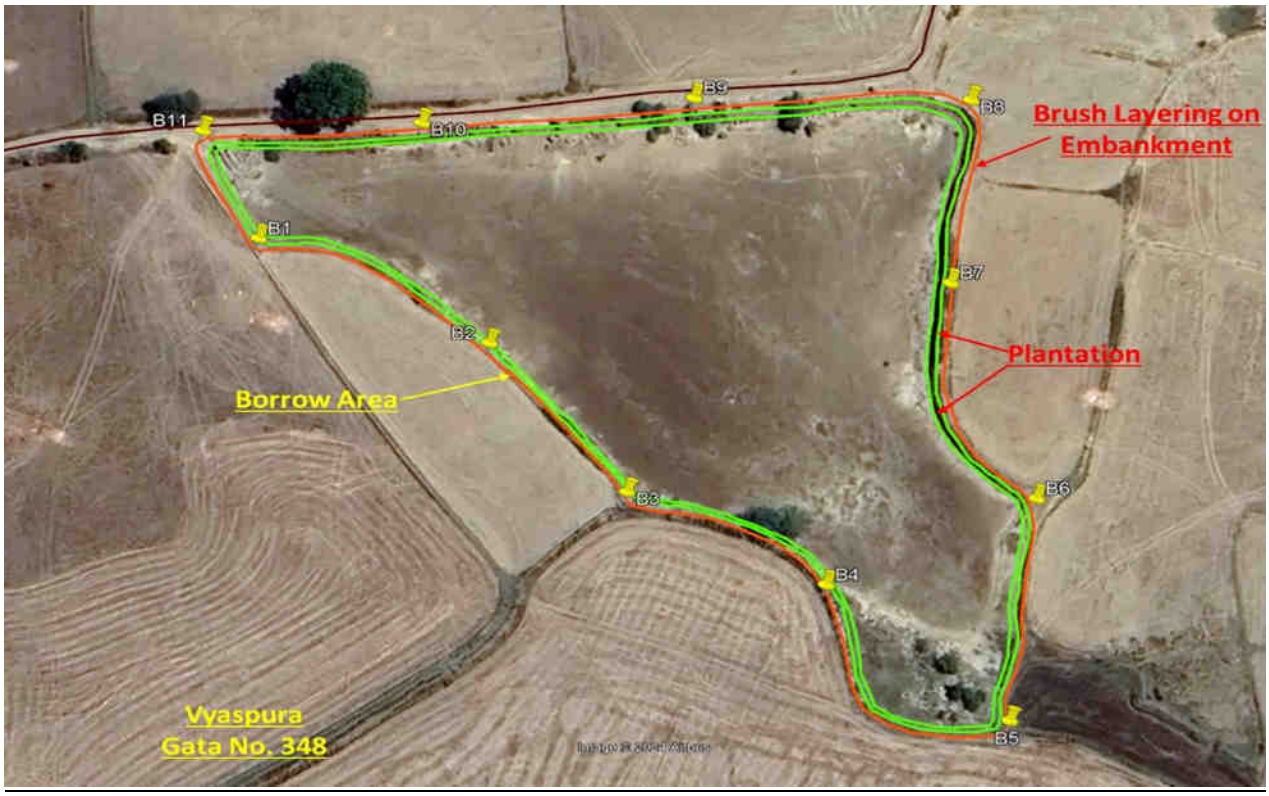
Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is first to be conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan



Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area	Volume	Unit Cost per cu.m	Total Cost
0	1.5	1	0.75	0	175	0
54	1.5	1	0.75	40.5	175	7087.5
45	1.5	1	0.75	33.75	175	5906.25
45	1.5	1	0.75	33.75	175	5906.25
55	1.5	1	0.75	41.25	175	7218.75
50	1.5	1	0.75	37.5	175	6562.5
54	1.5	1	0.75	40.5	175	7087.5
42	1.5	1	0.75	31.5	175	5512.5
55	1.5	1	0.75	41.25	175	7218.75
52	1.5	1	0.75	39	175	6825
43	1.5	1	0.75	32.25	175	5643.75
25	1.5	1	0.75	18.75	175	3281.25
Total						68250

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	507	3263.01	16543.46
Perimeter 2	497	3263.01	16217.16
Total			32760.62

3. Brush Layering:

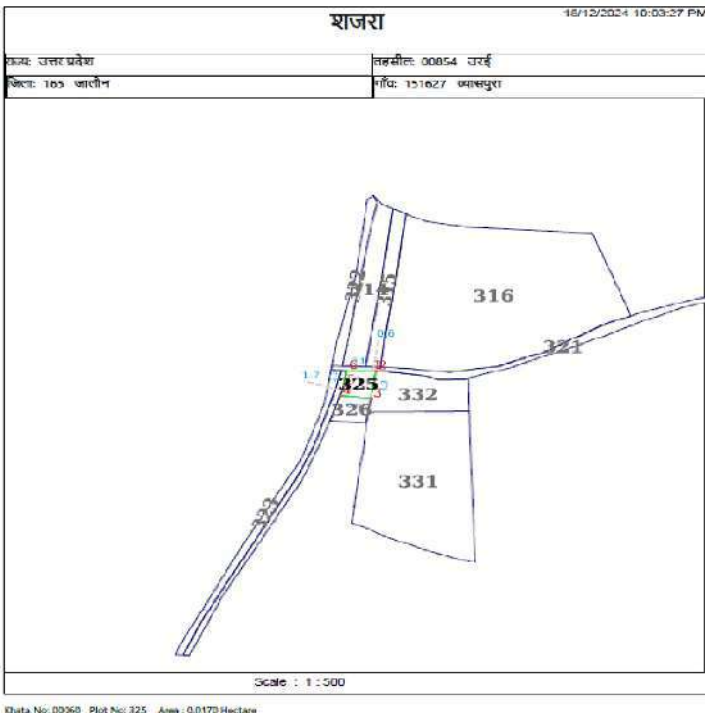
Brush Layering:	Length	Unit Price	Total
Entire Embankment	518	142.5	73815

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 73815/-.

The total cost of remediation plan would be Rs. 174825.62 /-.

21. Vyaspura: Gata No. 325 (S. No-21 - Notice No - 1949/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice states that excessive mining of 2.5 m soil has been carried out form Gata No. 325. It is having the total plot area as 0.0170 Hectare.



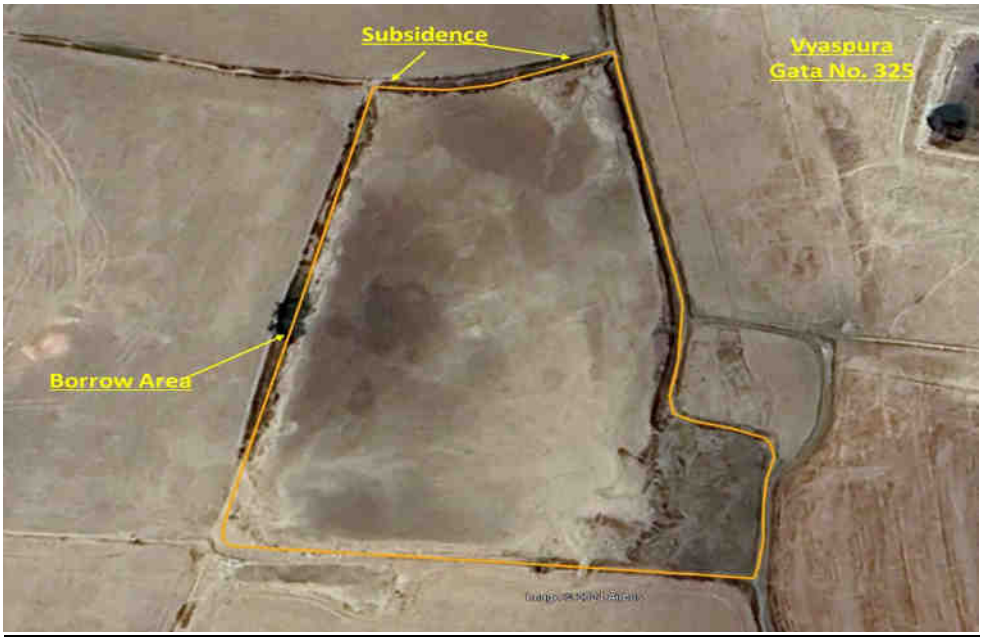
Google Imagery 5/9/2023

Photographs

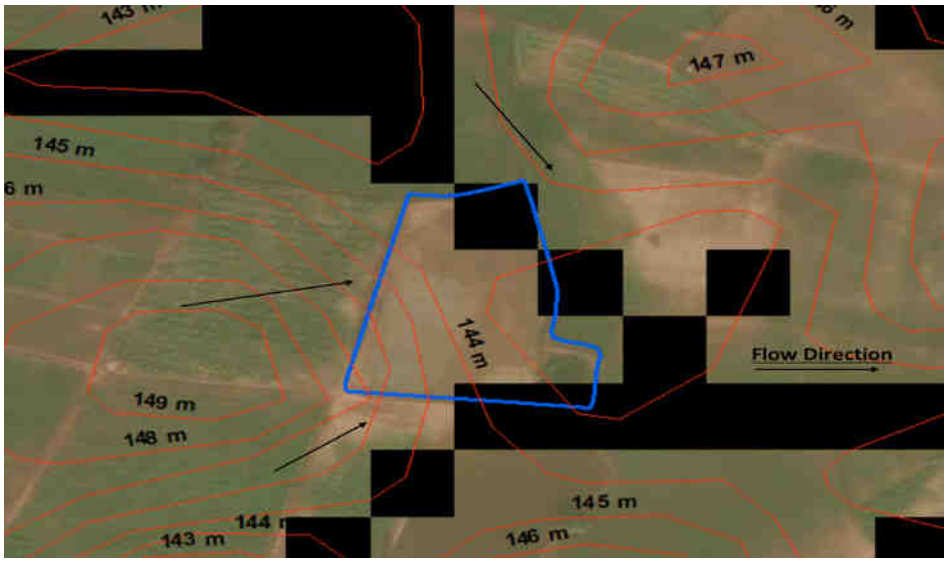
Current Situation

The borrow area is situated on North direction of village road. It is having almost Trapezoidal shape. Vegetation and shrubs are almost absent in borrow area and all sides have farm land. The Noon River is situated in south direction about 330 m from the borrow area, flowing in the direction from west to east. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purposes. The farm land on all sides of borrow area is observed to be unstable owing to topographical features. The spatial data pertaining all basic information was assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicates that the flow is slightly from north west to south east direction, from east to west direction towards the borrow area.

Descriptive View



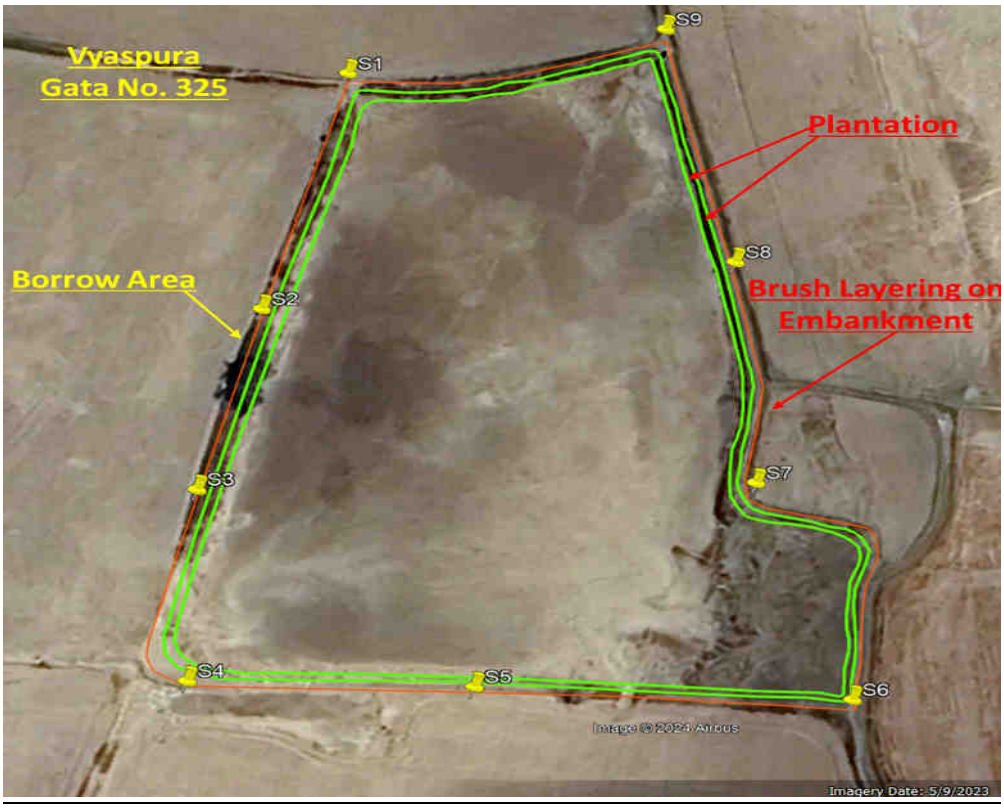
Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is first to be conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan



Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
40	1.5	1	0.75	30	175	5250
30	1.5	1	0.75	22.5	175	3937.5
30	1.5	1	0.75	22.5	175	3937.5
33	1.5	1	0.75	24.75	175	4331.25
45	1.5	1	0.75	33.75	175	5906.25
44	1.5	1	0.75	33	175	5775
37	1.5	1	0.75	27.75	175	4856.25
37	1.5	1	0.75	27.75	175	4856.25
40	1.5	1	0.75	30	175	5250
Total						44100

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	325	3263.01	10604.78
Perimeter 2	317	3263.01	10343.74
Total			20948.52

3. Brush Layering:

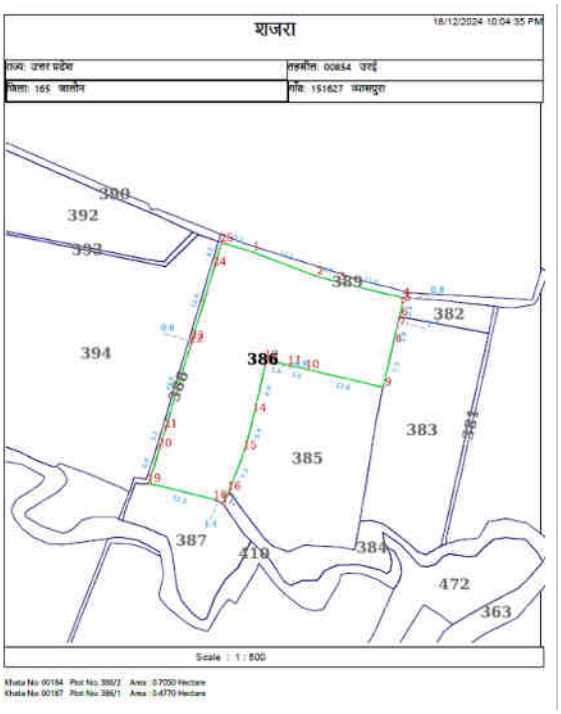
Brush Layering:	Length	Unit Price	Total
Entire Embankment	336	142.5	47880

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 47880/-.

The total cost of remediation plan would be Rs. 112928.52 /-.

22a**. Vyaspura**: Gata No. 386/2 **(**S. No-22 - Notice No - 1950/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 3 m soil has been carried out form Gata No. 386/2. It is having the total plot area as 0.7050 Hectare.



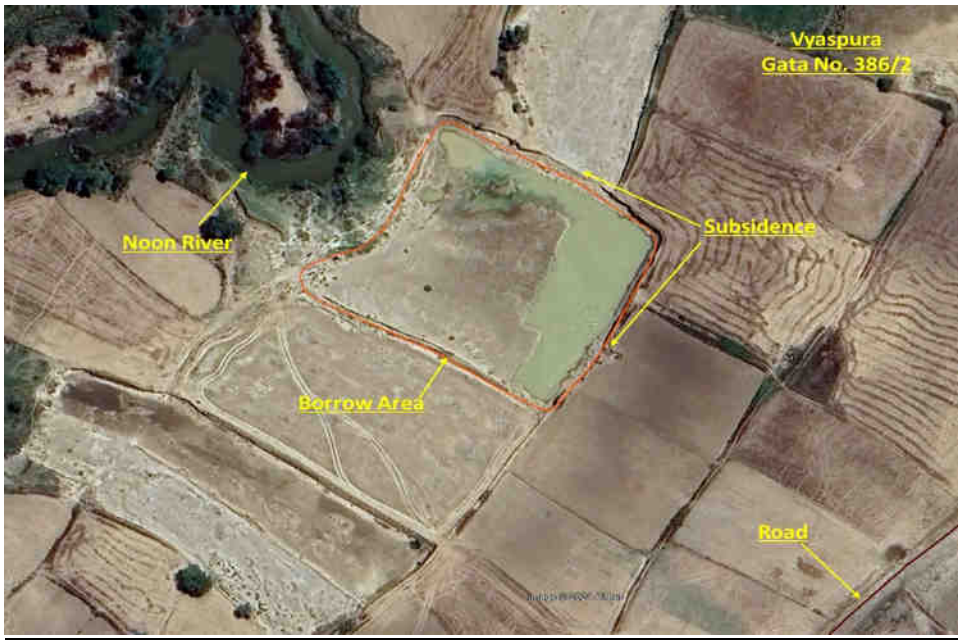
Google Imagery

Photographs

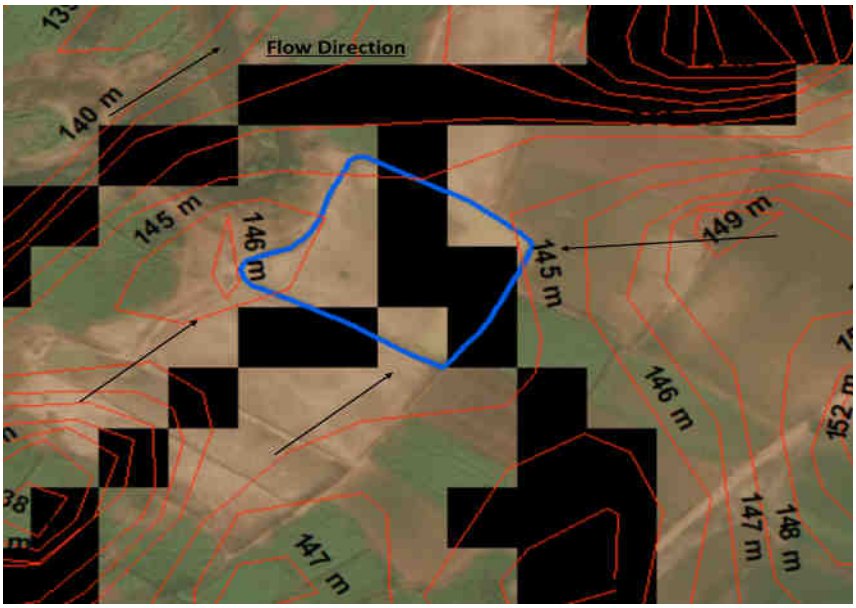
Current Situation

The borrow area is situated on North west direction of village road. It is having almost rectangular shape, vegetation and shrubs are almost absent in borrow area and all sides have farm land. The noon river is flowing north direction from west to east. The Noon River is situated in north direction sharing its embankment with the borrow area. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from south west to north east direction, from east to west direction towards the borrow area.

Descriptive View



Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0	175	0
47	1.5	1	0.75	35.25	175	6168.75
48	1.5	1	0.75	36	175	6300
37	1.5	1	0.75	27.75	175	4856.25
39	1.5	1	0.75	29.25	175	5118.75
44	1.5	1	0.75	33	175	5775
42	1.5	1	0.75	31.5	175	5512.5
39	1.5	1	0.75	29.25	175	5118.75
41	1.5	1	0.75	30.75	175	5381.25
Total				192.75	175	33731.25

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	321	3263.01	10474.26
Perimeter 2	314	3263.01	10245.85
Total			20720.11

3. Brush Layering:

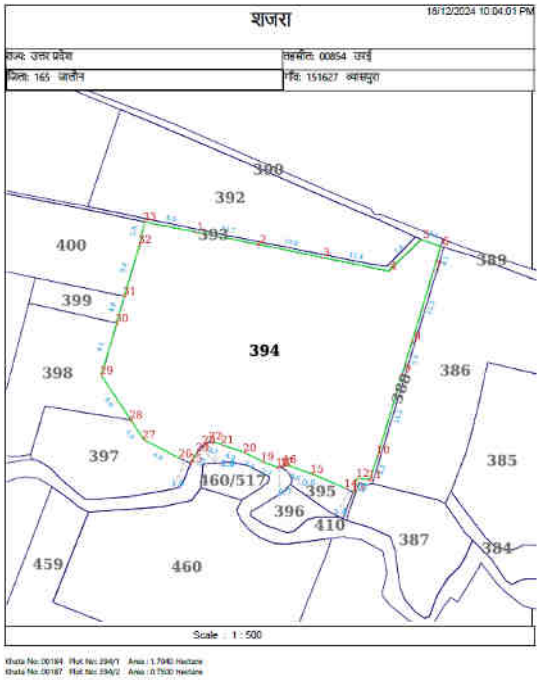
Brush Layering:	Length	Unit Price	Total
Entire Embankment	331	142.5	47167.5

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 47167.5/-.

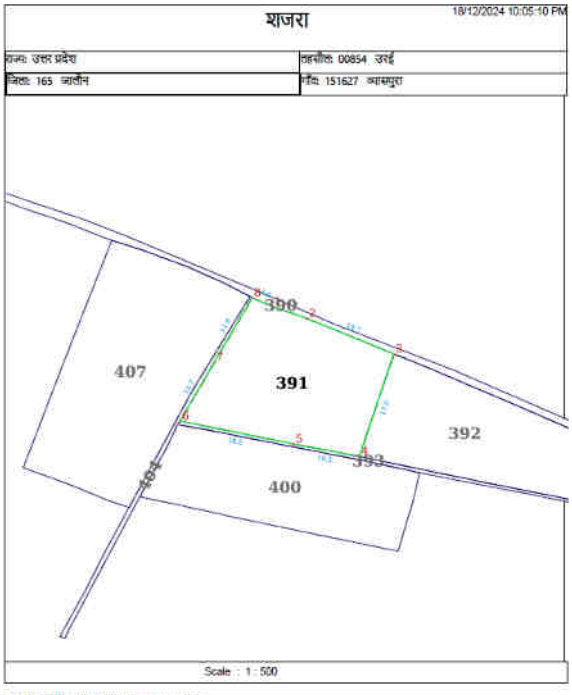
The total cost of remediation plan would be Rs. 101618.86 /-.

22b. to 25 Vyaspura: Gata No. 394/1**(**S. No-22 to 26 - Notice No – 1950 to 54/Khanij-M.M.C.-30 Dated 2/10/2021)

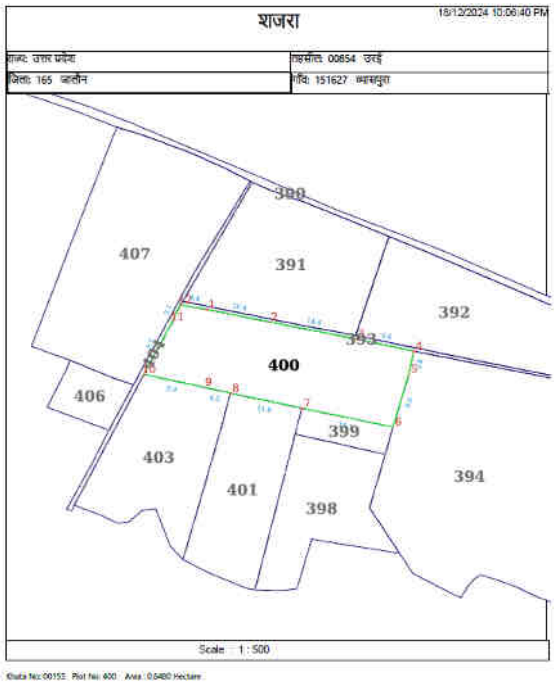
The notice regarding excessive mining of 4 m soil has been carried out form Gata No. 394/1. It is having the total plot area as 2.454 Hectare.



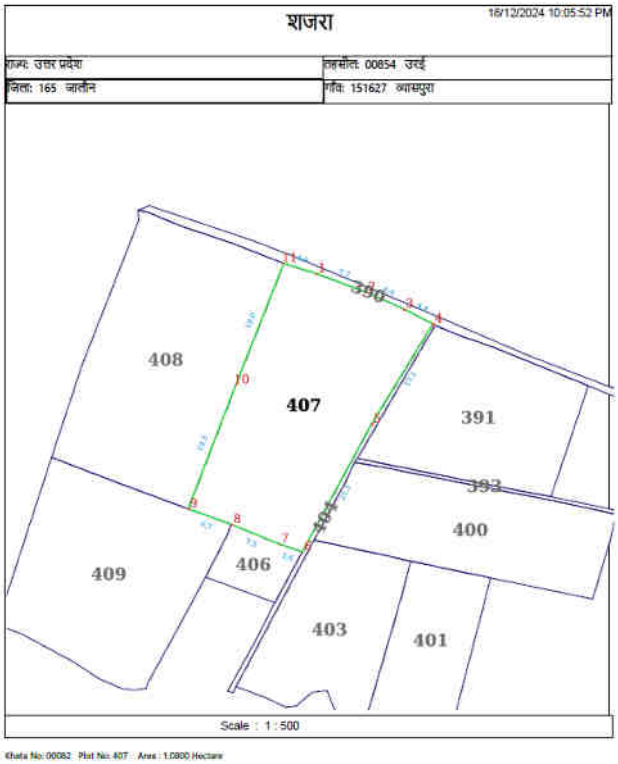
The notice regarding excessive mining of 2 m soil has been carried out form Gata No. 391. It is having the total plot area as 0.6930 Hectare.



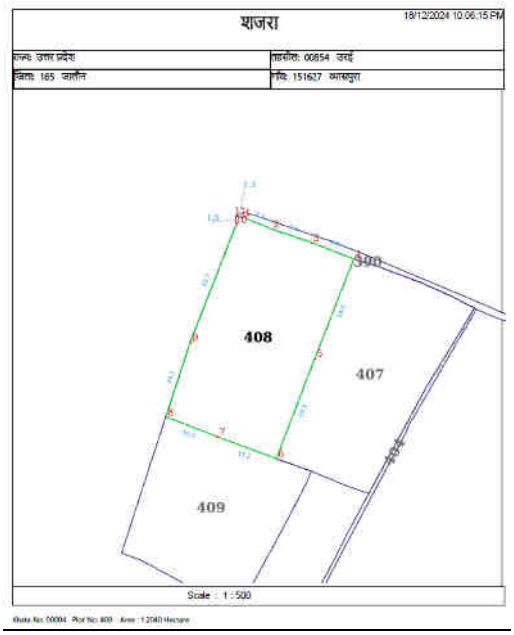
The notice regarding excessive mining of 4 m soil has been carried out form Gata No. 400. It is having the total plot area as 0.6480 Hectare.



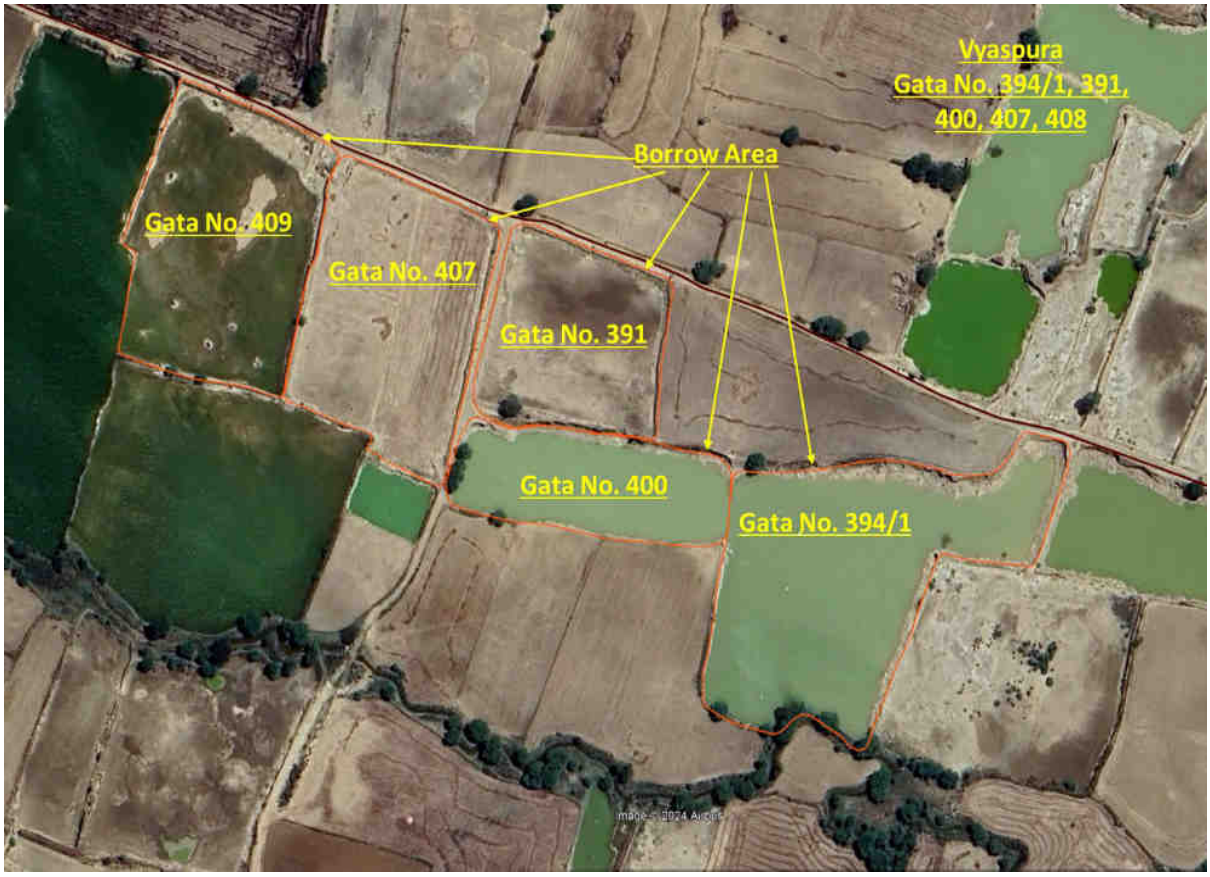
The notice regarding excessive mining of 1 m soil has been carried out form Gata No. 407. It is having the total plot area as 1.0800 Hectare.



The notice regarding excessive mining of 1 m soil has been carried out form Gata No. 408. It is having the total plot area as 1.2040 Hectare.



Google Imagery (Date-05/09/2023)



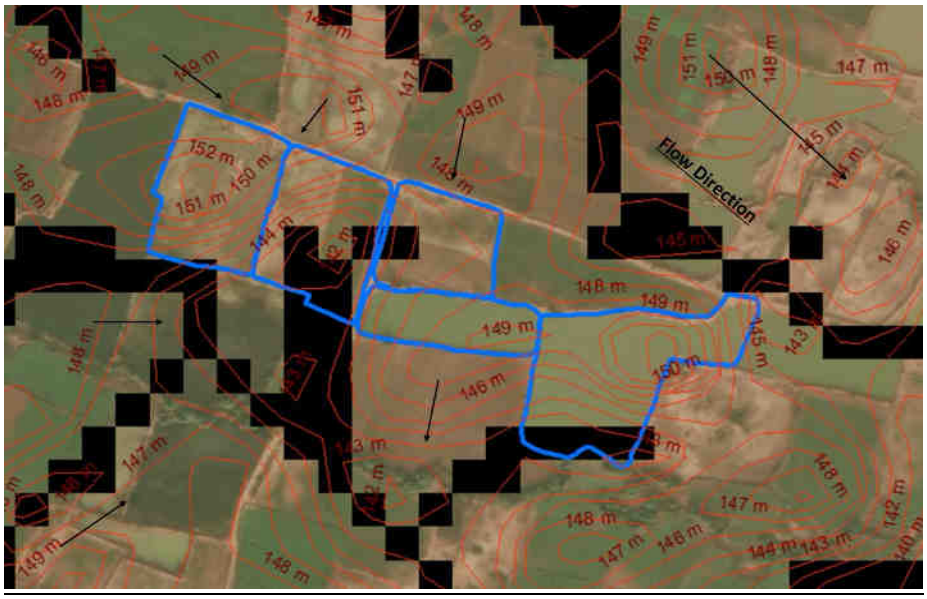
Photographs

Current Situation

The borrow areas is situated on south side of village road. Vegetation and shrubs are almost absent in borrow area and all sides have farm land. The tributary of noon river is flowing in south of the borrow area in west to east direction sharing its embankment. Tree line is prevailing on embankment The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a series of ponds. The water is further used for irrigation purpose. The farm land on all sides of borrow area is observed to be unstable owing to topography. Subsidence of soil along the bunds is visual in North side of the borrow area which is caused by vertical digging. The topography is highly undulating and farm lands are not suitable for cash crop cultivation, owing to ravine nature as can be seen from imagery. Moreover, the noon river is flowing next to the farm lands, the farmers therefore felt it appropriate to convert these farm land into ponds and use it for irrigation in adjoining flat lands where cash crop cultivation is possible. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from north to south direction towards the borrow areas.

Descriptive View

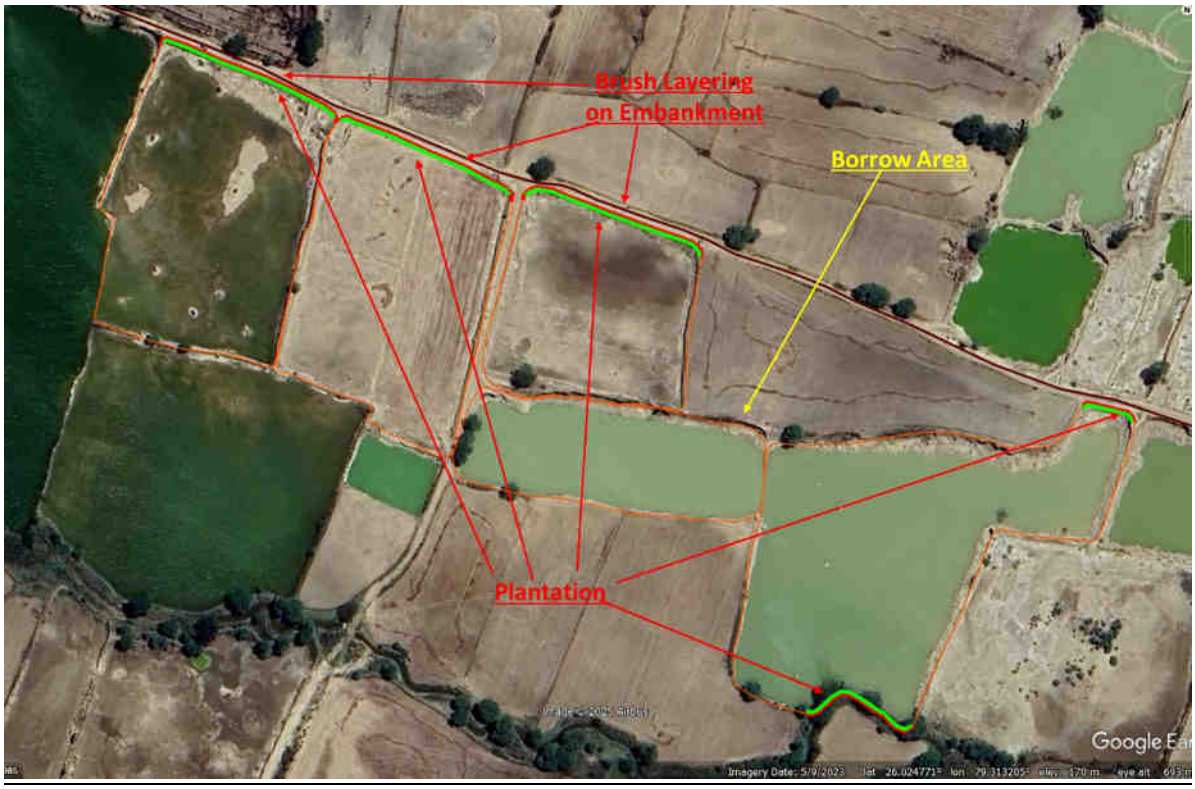
Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering wherever feasible, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan



Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
99.23	1.5	1	0.75	74.42	175	13023.94
99.35	1.5	1	0.75	74.51	175	13039.69
97.59	1.5	1	0.75	73.19	175	12808.69
30.23	1.5	1	0.75	22.67	175	3967.69
62.42	1.5	1	0.75	46.82	175	8192.63
Total				291.62	175	51032.63

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	369.2	3263.01	12047.03
Perimeter 2	358.72	3263.01	11705.07
Total			23752.10

3. Brush Layering:

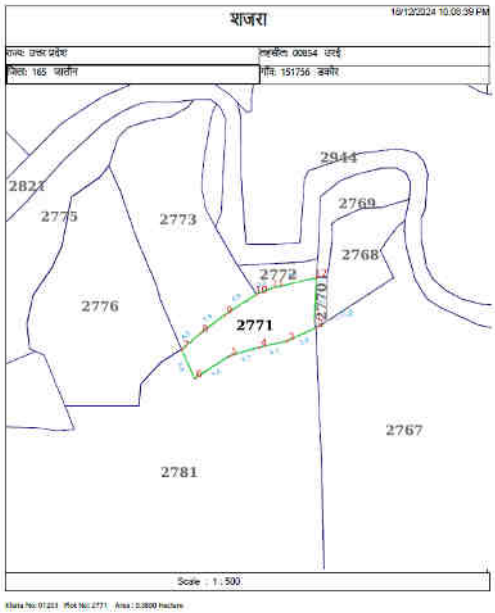
Brush Layering:	Length	Unit Price	Total
Entire Embankment	388.83	142.5	55408.27

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 55408.27/-.

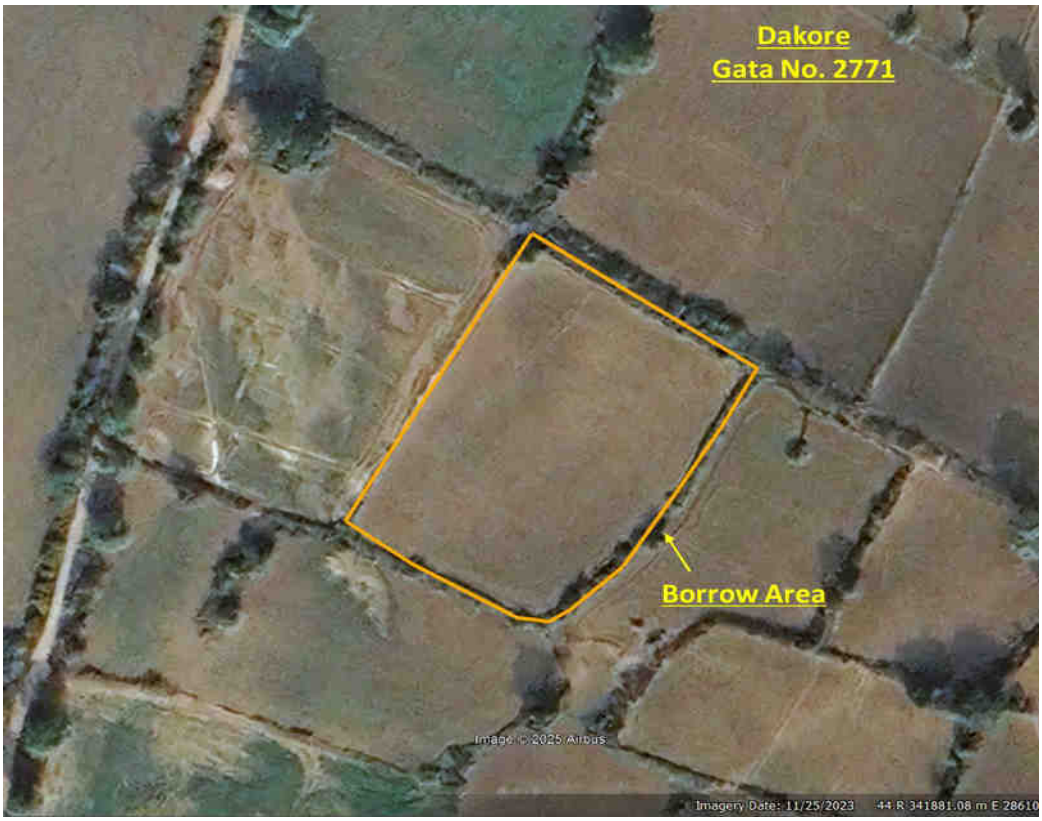
The total cost of remediation plan would be Rs. 130193.00/-.

26a. Dakore : Gata No. 2771 **(**S.No-26 - Notice No - 1954/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 1 m soil has been carried out form Gata No. 2771. It is having the total plot area as 0.3880 Hectare.



Google Imagery (Date-25/11/2023)

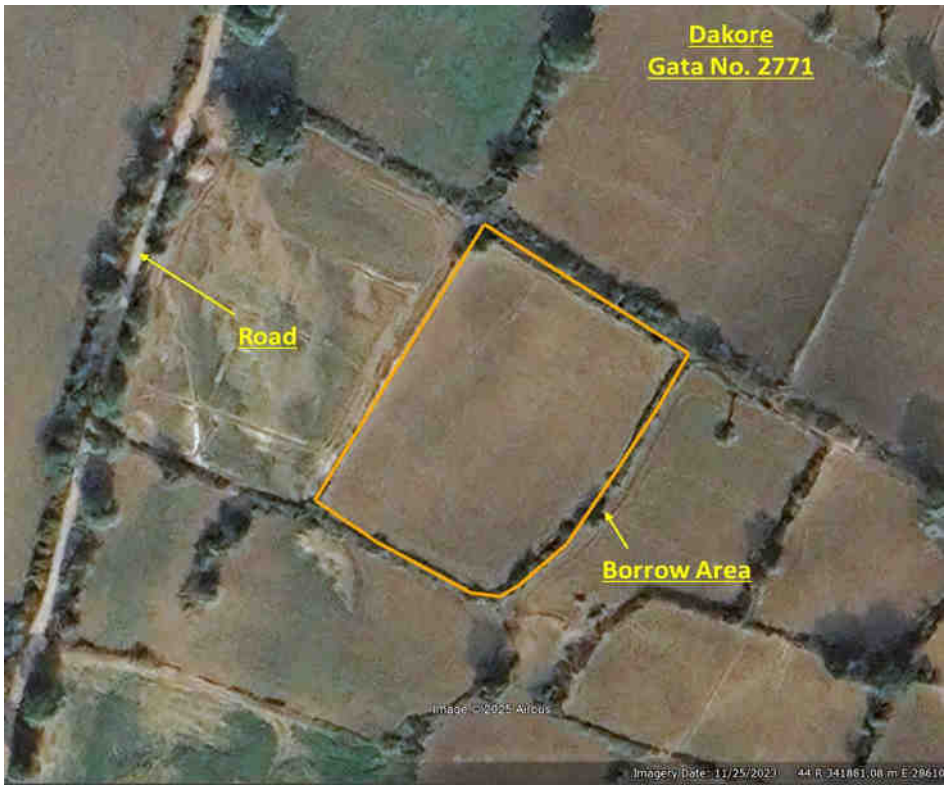


Photographs

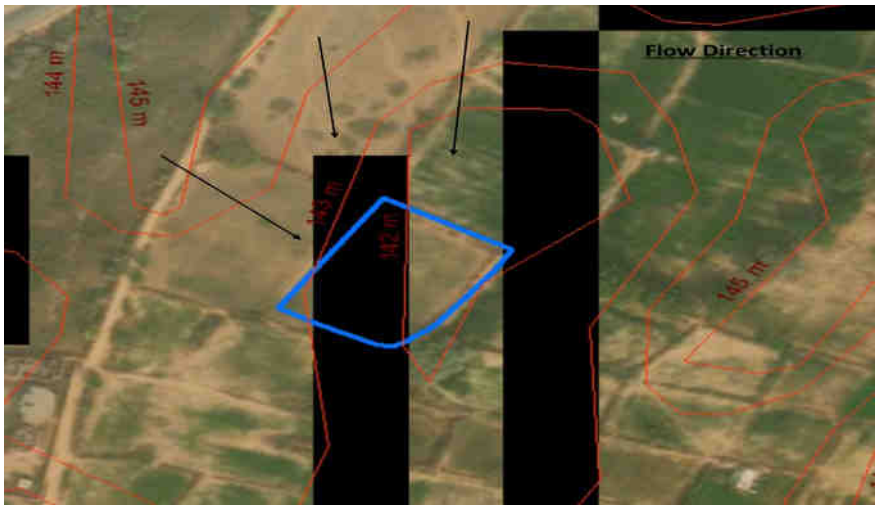
Current Situation.

The borrow area is situated on east side of road. Vegetation and shrubs are present in borrow area and all sides have farm lands. The topography is highly undulation and farm lands are not suitable for cash crop cultivation, owing to ravine nature as can be seen from imagery, the river is flowing next to the farm lands, the farmers therefore felt it appropriate to convert these ravine land into flat farm land and use it for cash crop cultivation. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a Flat Farm Land. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from north to south direction, towards the borrow areas.

Descriptive View



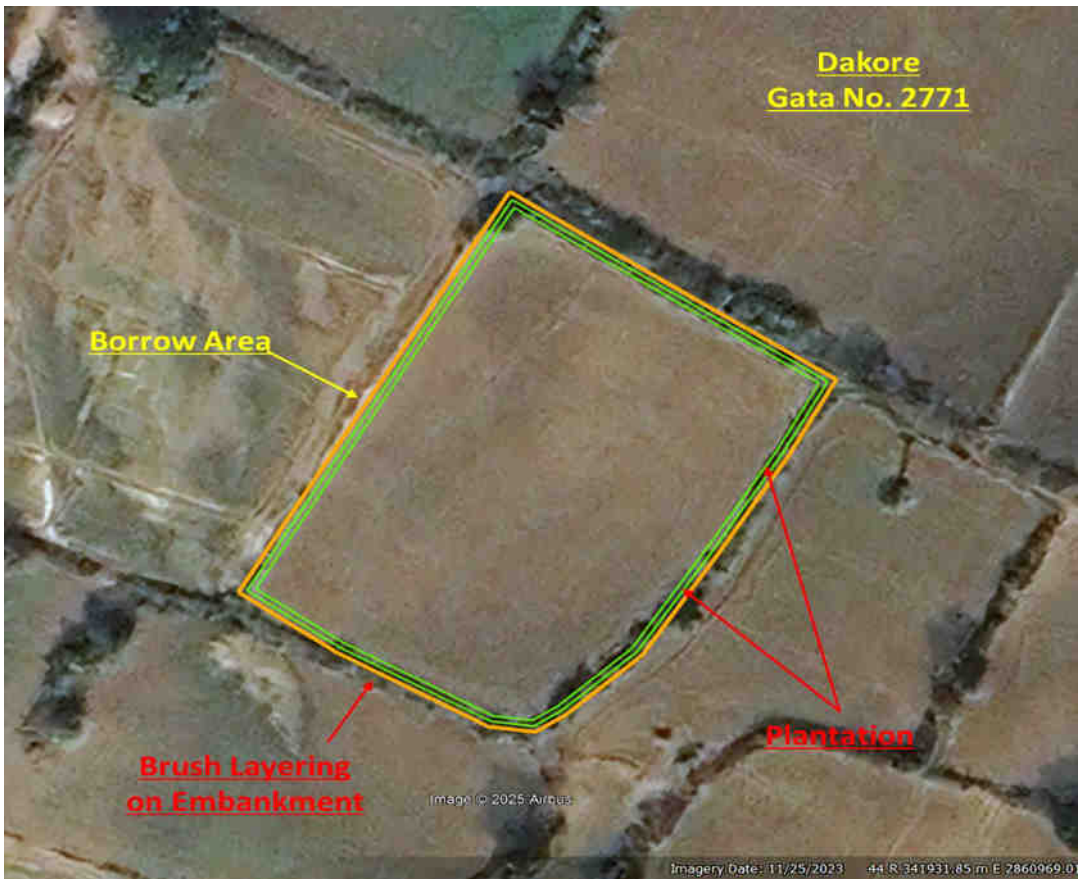
Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan



Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
25.25	1.5	1	0.75	18.94	175	3314.06
37.78	1.5	1	0.75	28.34	175	4958.63
31.48	1.5	1	0.75	23.61	175	4131.75
29.13	1.5	1	0.75	21.85	175	3823.31
20.99	1.5	1	0.75	15.74	175	2754.94
29.12	1.5	1	0.75	21.84	175	3822.00
32.42	1.5	1	0.75	24.32	175	4255.13
Total				154.63	175	27059.81

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	200.58	3263.01	6544.95
Perimeter 2	194.95	3263.01	6361.24
Total			12906.18

3. Brush Layering:

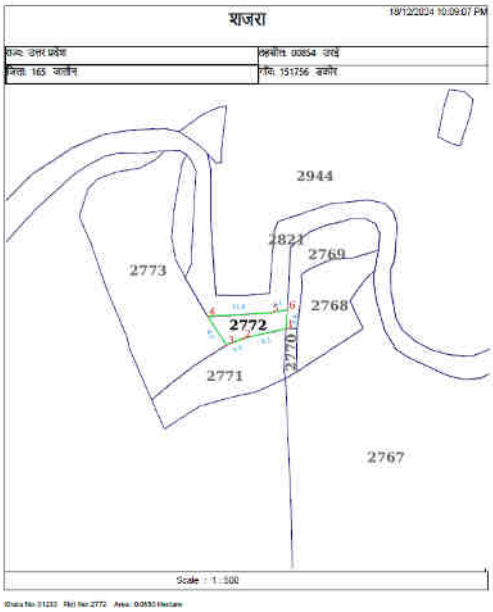
Brush Layering:	Length	Unit Price	Total
Entire Embankment	206.21	142.5	29384.93

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 29384.93/-.

The total cost of remediation plan would be Rs. 69350.92/-.

26b. Dakore : Gata No. 2772 **(**S.No-26 - Notice No - 1954/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 1 m soil has been carried out form Gata No. 2772. It is having the total plot area as 0.0650 Hectare.



Google Imagery (Date-25/11/2023)

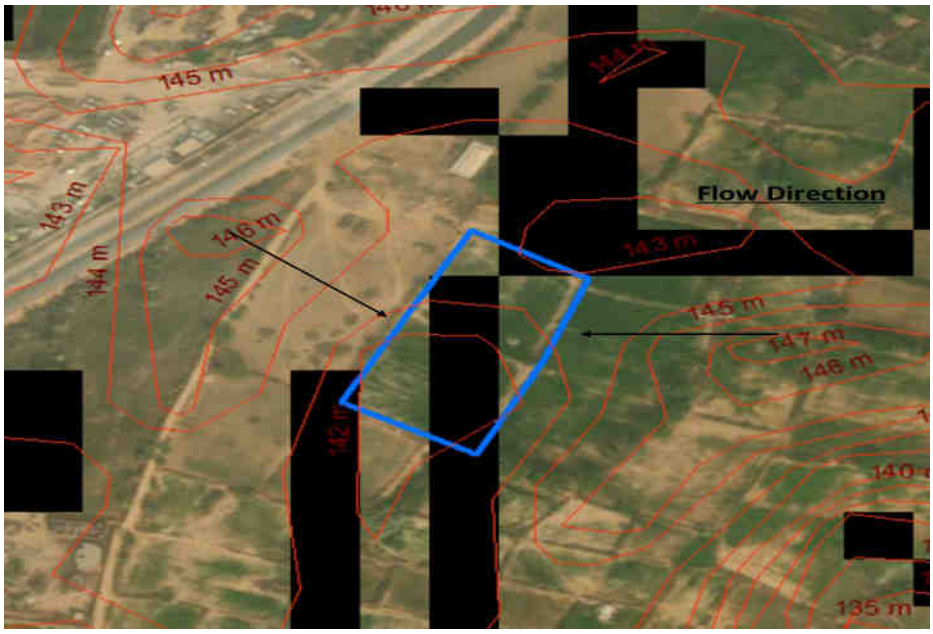
Photographs

Current Situation.

The borrow area is situated on east side of road. Vegetation and shrubs are present in borrow area and all sides have farm lands. The topography is highly undulation and farm lands are not suitable for cash crop cultivation, owing to ravine nature as can be seen from imagery, the river is flowing next to the farm lands, the farmers therefore felt it appropriate to convert these ravine land into flat farm land and use it for cash crop cultivation. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a Flat Farm Land. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from west to east direction and from east to west direction, towards the borrow areas.

Descriptive View

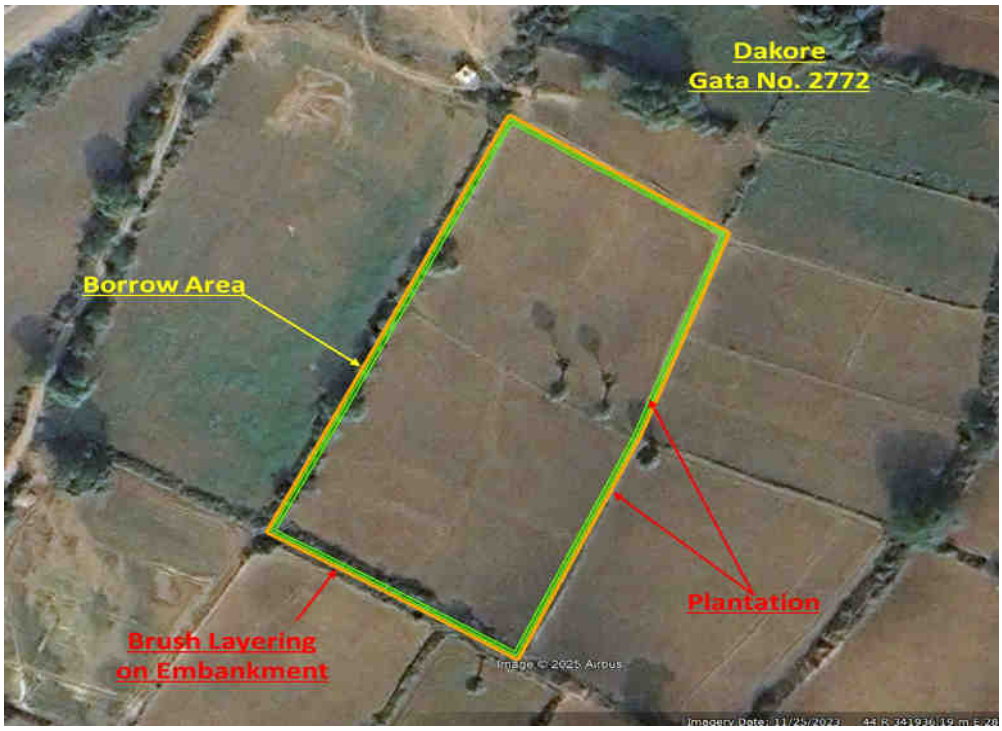
Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan



Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
33.12	1.5	1	0.75	24.84	175	4347.00
31.24	1.5	1	0.75	23.43	175	4100.25
64.79	1.5	1	0.75	48.59	175	8503.69
57.72	1.5	1	0.75	43.29	175	7575.75
56.97	1.5	1	0.75	42.73	175	7477.31
41.74	1.5	1	0.75	31.31	175	5478.38
40.85	1.5	1	0.75	30.64	175	5361.56
41.66	1.5	1	0.75	31.25	175	5467.88
Total				276.07	175	48311.81

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	362.1	3263.01	11815.36
Perimeter 2	356.08	3263.01	11618.93
Total			23434.29

3. Brush Layering:

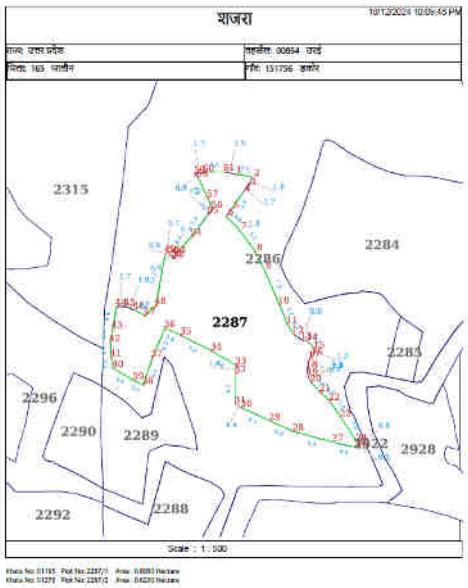
Brush Layering:	Length	Unit Price	Total
Entire Embankment	368.13	142.5	52458.53

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 52458.53/-.

The total cost of remediation plan would be Rs. 124204.62 /-.

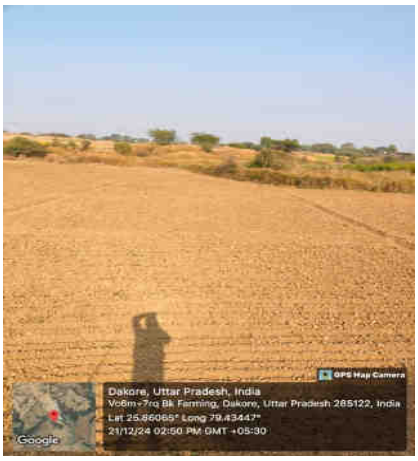
27. Dakore : Gata No. 2287 **(**S.No-27 - Notice No - 1955/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 1 m soil has been carried out form Gata No. 2287. It is having the total plot area is 1.432 Hectare.



Google Imagery (Date-25/11/2023)

Photographs

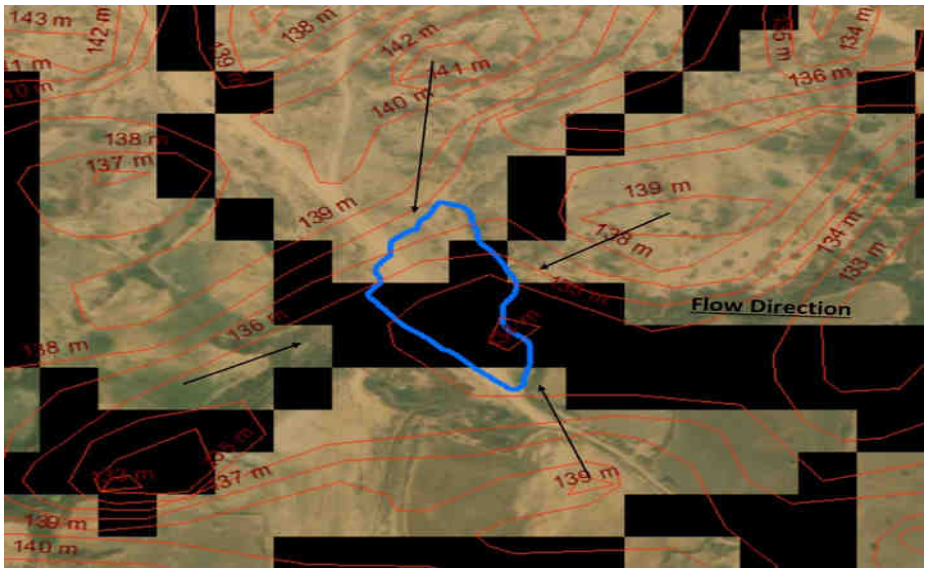


Current Situation

The borrow area is situated on north side of road sharing embankment, it is situated on west side of local river. Vegetation and shrubs are present in borrow area and all sides have farm lands. The topography is highly undulation and farm lands are not suitable for cash crop cultivation, owing to ravine nature as can be seen from imagery, the river is flowing next to the farm lands, the farmers therefore felt it appropriate to convert these ravine land into flat farm land and use it for cash crop cultivation. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a Flat Farm Land. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from all direction, towards the borrow areas.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
20.1	1.5	1	0.75	15.08	175	2638.13
25.27	1.5	1	0.75	18.95	175	3316.69
26.26	1.5	1	0.75	19.70	175	3446.63
23.87	1.5	1	0.75	17.90	175	3132.94
24.56	1.5	1	0.75	18.42	175	3223.50
27.69	1.5	1	0.75	20.77	175	3634.31
30.82	1.5	1	0.75	23.12	175	4045.13
29.54	1.5	1	0.75	22.16	175	3877.13
24.51	1.5	1	0.75	18.38	175	3216.94
37.7	1.5	1	0.75	28.28	175	4948.13
28.62	1.5	1	0.75	21.47	175	3756.38
25.35	1.5	1	0.75	19.01	175	3327.19
19.34	1.5	1	0.75	14.51	175	2538.38
Total				257.72	175	45101.44

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	338.61	3263.01	11048.88
Perimeter 2	333.52	3263.01	10882.79
Total			21931.67

3. Check dam/ Brush Layering:

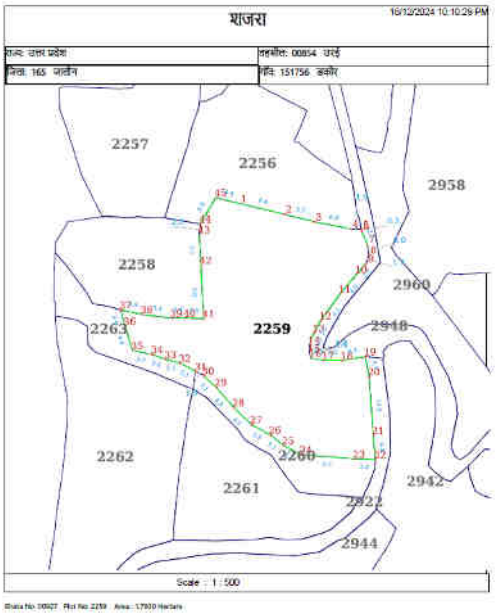
Brush Layering:	Length	Unit Price	Total
Entire Embankment	343.7	142.5	48977.25

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 48977.25/-.

The total cost of remediation plan would be Rs. 116010.36/-.

28. Dakore : Gata No. 2259 **(**S.No-28 - Notice No - 1956/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 1 m soil has been carried out form Gata No. 2259. It is having the total plot area is 1.7930 Hectare.



Google Imagery (Date-25/11/2023)

Photographs

Current Situation

The borrow area is situated on north side of road sharing embankment, it is situated on west side of local river. Vegetation and shrubs are present in borrow area and all sides have farm lands. The topography is highly undulation and farm lands are not suitable for cash crop cultivation, owing to ravine nature as can be seen from imagery, the river is flowing next to the farm lands, the farmers therefore felt it appropriate to convert these ravine land into flat farm land and use it for cash crop cultivation. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a Flat Farm Land. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from all direction, towards the borrow areas.

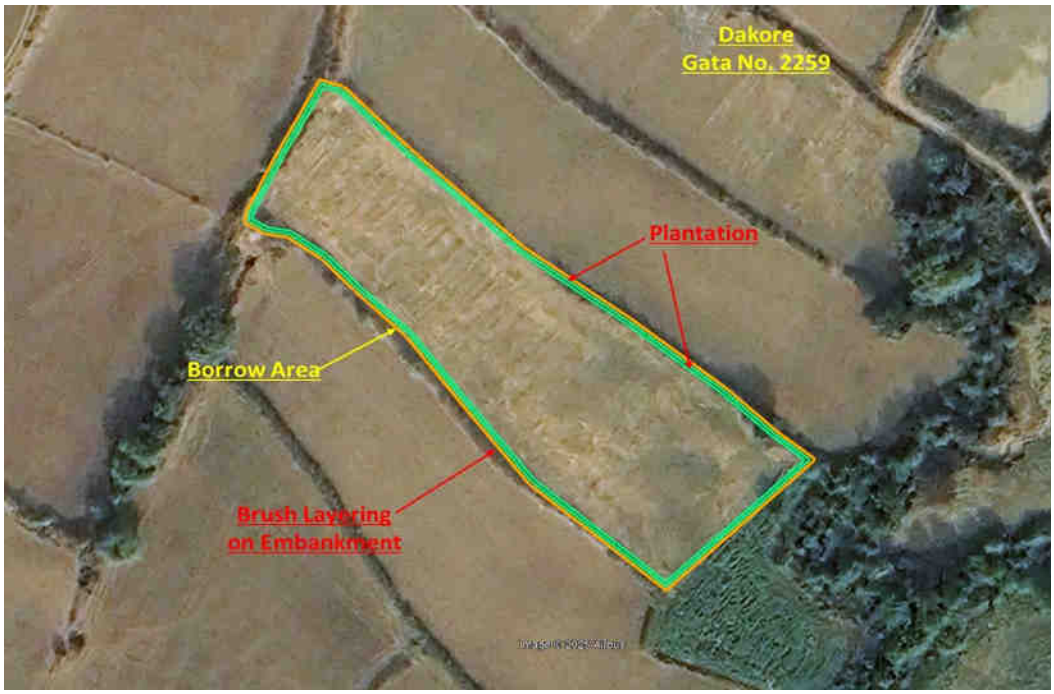
Descriptive View

Digital Elevation Model and Flow Direction

Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan



Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
35.06	1.5	1	0.75	26.30	175	4601.63
21.48	1.5	1	0.75	16.11	175	2819.25
21.48	1.5	1	0.75	16.11	175	2819.25
24.73	1.5	1	0.75	18.55	175	3245.81
28.98	1.5	1	0.75	21.74	175	3803.63
23.55	1.5	1	0.75	17.66	175	3090.94
27.22	1.5	1	0.75	20.42	175	3572.63
28.62	1.5	1	0.75	21.47	175	3756.38
27.44	1.5	1	0.75	20.58	175	3601.50
25.59	1.5	1	0.75	19.19	175	3358.69
20.64	1.5	1	0.75	15.48	175	2709.00
22.93	1.5	1	0.75	17.20	175	3009.56
24.09	1.5	1	0.75	18.07	175	3161.81
Total				248.86	175	43550.06

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	310.8	3263.01	10141.44
Perimeter 2	305.4	3263.01	9965.23
Total			20106.67

3. Brush Layering:

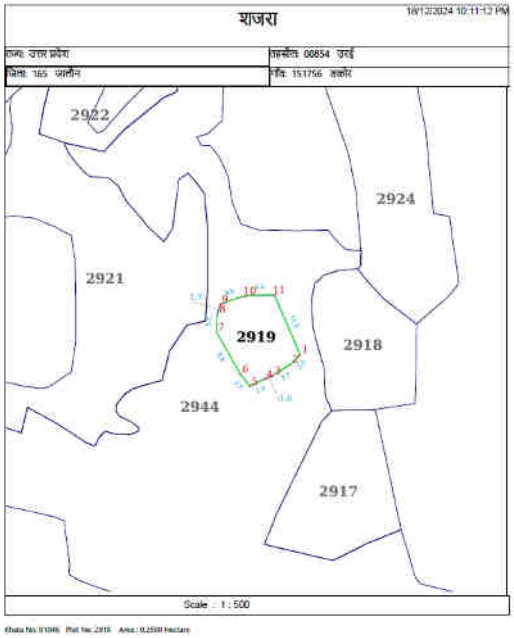
Brush Layering:	Length	Unit Price	Total
Entire Embankment	331.89	142.5	47294.33

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 47294.33/-.

The total cost of remediation plan would be Rs. 110951.06/-.

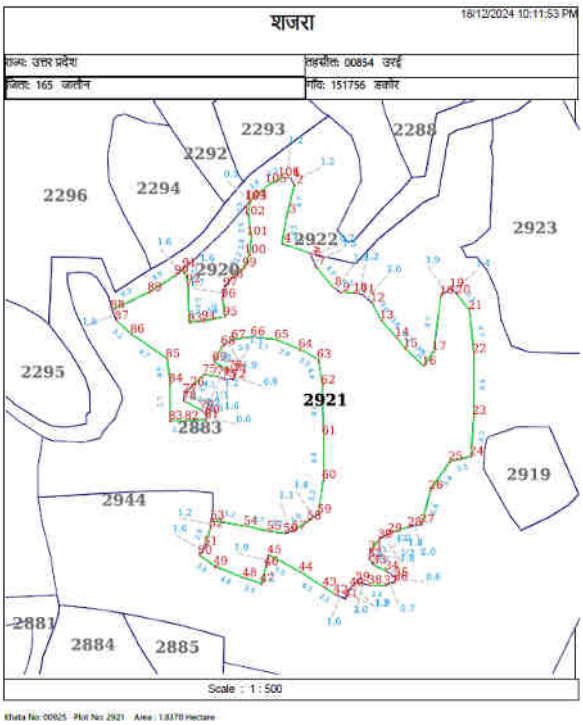
29. Dakore : Gata No. 2919 **(**S.No-29 - Notice No - 1957/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 1 m soil has been carried out form Gata No. 2919. It is having the total plot area as 0.2590 Hectare.



30. Dakore : Gata No. 2921 **(**S.No-30 - Notice No - 1958/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 2 m soil has been carried out form Gata No. 2921. It is having the total plot area as 1.8370 Hectare.



Google Imagery (Date-25/11/2023)

Photographs

Current Situation.

The borrow area is situated on east side of road. Vegetation and shrubs are present in borrow area and all sides have farm lands. The topography is highly undulation and farm lands are not suitable for cash crop cultivation, owing to ravine nature as can be seen from imagery, the river is flowing next to the farm lands, the farmers therefore felt it appropriate to convert these ravine land into flat farm land and use it for cash crop cultivation. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a Flat Farm

Land. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from North west to South east direction and from north to east direction, towards the borrow areas.

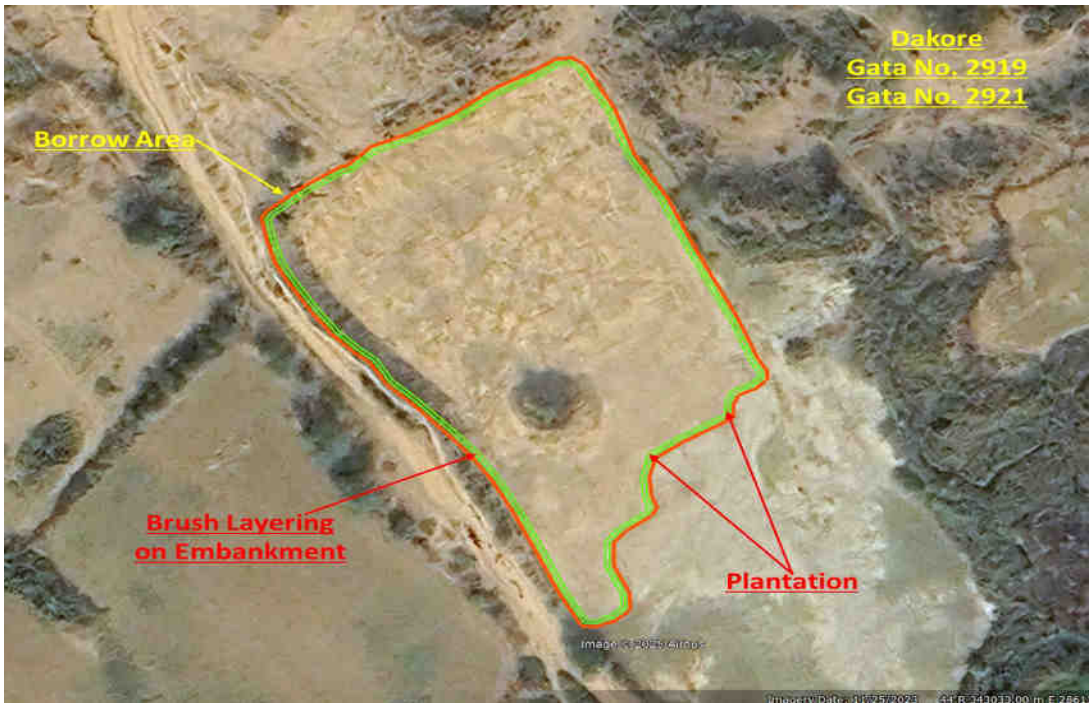
Descriptive View

Digital Elevation Model and Flow Direction

Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan



Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
30.04	1.5	1	0.75	22.53	175	3942.75
28.64	1.5	1	0.75	21.48	175	3759.00
36.92	1.5	1	0.75	27.69	175	4845.75
28.03	1.5	1	0.75	21.02	175	3678.94
31.74	1.5	1	0.75	23.81	175	4165.88
25.43	1.5	1	0.75	19.07	175	3337.69
43.94	1.5	1	0.75	32.96	175	5767.13
38.9	1.5	1	0.75	29.18	175	5105.63
36.5	1.5	1	0.75	27.38	175	4790.63
29.76	1.5	1	0.75	22.32	175	3906.00
Total				247.43	175	43299.38

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	324.81	3263.01	10598.58
Perimeter 2	319.66	3263.01	10430.54
Total			21029.12

3. Brush Layering:

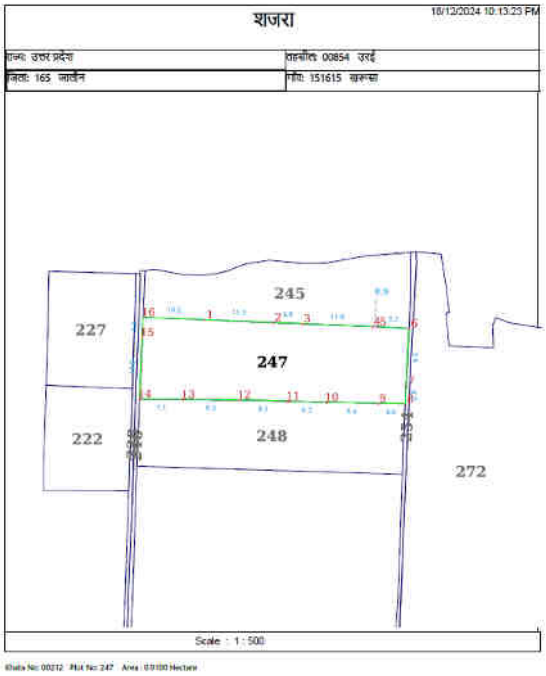
Brush Layering:	Length	Unit Price	Total
Entire Embankment	329.95	142.5	47017.88

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 47017.88/-.

The total cost of remediation plan would be Rs. 111346.37/-.

31. Kharusa : Gata No. 247 **(**S.No-31 - Notice No - 1959/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 12 m soil has been carried out form Gata No. 247. It is having the total plot area is 0.9100 Hectare.



Google Imagery (Date-5/9/2023)

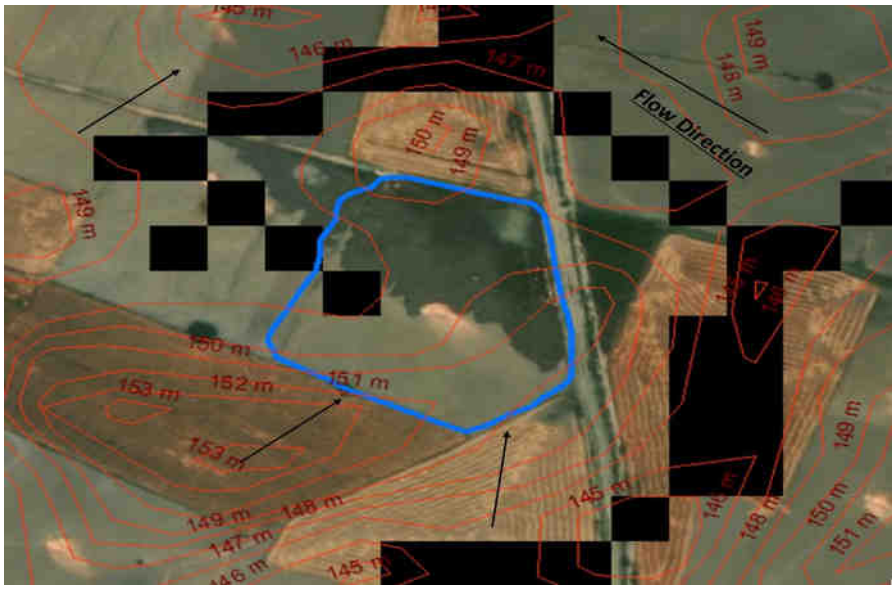
Photographs

Current Situation

The borrow area is situated on west side of road sharing embankment, it is situated on west side of canal. Vegetation and shrubs are absent in borrow area and all sides have farm lands. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a pond. The water is further used for irrigation purpose. Visual marks of subsidence in west side of borrow area. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from south to north direction, towards the borrow areas.

Descriptive View

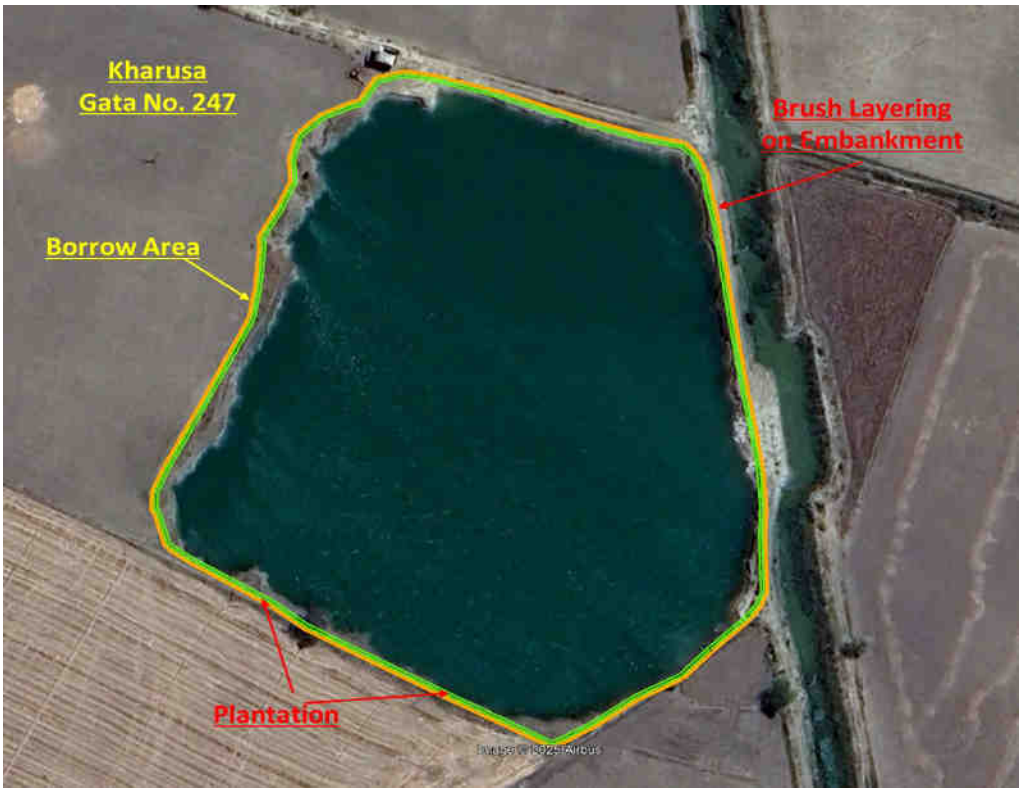
Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan



Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
36.91	1.5	1	0.75	27.68	175	4844.44
32.34	1.5	1	0.75	24.26	175	4244.63
44.7	1.5	1	0.75	33.53	175	5866.88
38.6	1.5	1	0.75	28.95	175	5066.25
40.95	1.5	1	0.75	30.71	175	5374.69
40.66	1.5	1	0.75	30.50	175	5336.63
45.15	1.5	1	0.75	33.86	175	5925.94
44.64	1.5	1	0.75	33.48	175	5859.00
37.63	1.5	1	0.75	28.22	175	4938.94
40.43	1.5	1	0.75	30.32	175	5306.44
38.72	1.5	1	0.75	29.04	175	5082.00
38.61	1.5	1	0.75	28.96	175	5067.56
29.82	1.5	1	0.75	22.37	175	3913.88
Total				381.87	175	66827.25

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	504.34	3263.01	16456.66
Perimeter 2	499.46	3263.01	16297.43
Total			32754.09

3. Brush Layering:

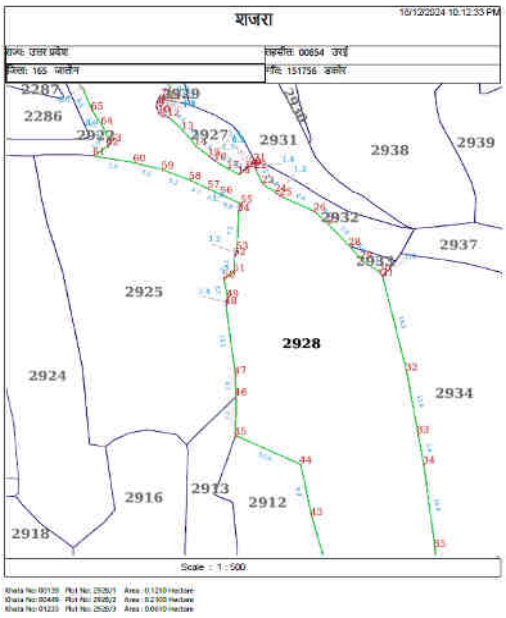
Brush Layering:	Length	Unit Price	Total
Entire Embankment	509.22	142.5	72563.85

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 72563.85/-.

The total cost of remediation plan would be Rs. 172145.19/-.

32. Dakore : Gata No. 2928 **(**S.No-32 - Notice No - 1960/Khanij-M.M.C.-30 Dated 2/10/2021)

The notice regarding excessive mining of 0.5 m soil has been carried out form Gata No. 2928. It is having the total plot area as 0.392 Hectare.



Google Imagery (Date-25/11/2023)

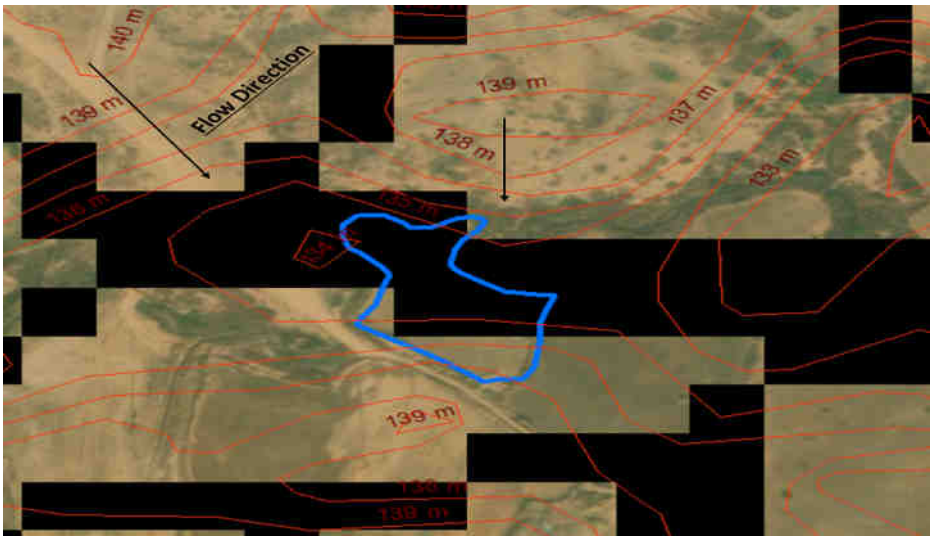
Photographs

Current Situation

The borrow area is situated on north side of road sharing embankment, it is situated on east side of local river. Vegetation and shrubs are present in borrow area and all sides have farm lands. The topography is highly undulation and farm lands are not suitable for cash crop cultivation, owing to ravine nature as can be seen from imagery, the river is flowing next to the farm lands, the farmers therefore felt it appropriate to convert these ravine land into flat farm land and use it for cash crop cultivation. The excavation work is carried out along the boundary of the farm land without creating any bench, hence vertical digging is done in all sides of borrow area thereby creating a Flat Farm Land. The spatial data pertaining all basic information were assembled and visualized. Based on collection of all layers, digital elevation model has been developed and contours have been generated to understand flow direction, which indicate that the flow is slightly from north to south direction, towards the borrow areas.

Descriptive View

Digital Elevation Model and Flow Direction



Remediation Measures

The entire perimeter of borrow area is to be first conserved with Slope Grading and brush layering, afterwards grass plantation is proposed down the slope in 2 consecutive rows with vertical distance of 750mm.

Pictorial View of Remediation Plan

Rate analysis for Remediation Measures

1. Grading of slope:

Unit Cost of Earth Work for grading of slope has been taken as Rs 175 per meter cube from the SOR of CPWD.

Station	Rise	Run	Area of Side	Volume	Unit Cost per meter cube	Total Cost
0	1.5	1	0.75	0.00	175	0
35.2	1.5	1	0.75	26.40	175	4620.00
24.6	1.5	1	0.75	18.45	175	3228.75
32.89	1.5	1	0.75	24.67	175	4316.81
36.69	1.5	1	0.75	27.52	175	4815.56
40.8	1.5	1	0.75	30.60	175	5355.00
35.89	1.5	1	0.75	26.92	175	4710.56
53.29	1.5	1	0.75	39.97	175	6994.31
45.88	1.5	1	0.75	34.41	175	6021.75
34.15	1.5	1	0.75	25.61	175	4482.19
Total				254.54	175	44544.94

2. Grass Plantation:

Assuming that each individual grass slips roughly 10cm x 10cm (0.1m x 0.1m), then 1000 slips would cover approximately 10 square meters. Therefore, grass plantation rate has been taken as Rs. 3263.01 per 10 square meters or 100 running meters.

Plantation	Perimeter	Labour Rate Plantation per 100 meters	Total Cost
Perimeter 1	333.66	3263.01	10887.36
Perimeter 2	327.89	3263.01	10699.08
Total			21586.44

3. Brush Layering:

Brush Layering:	Length	Unit Price	Total
Entire Embankment	339.43	142.5	48368.78

Taking the unit rate as Rs. 142.50 per running meter, the total cost would be Rs. 48368.78/-.

The total cost of remediation plan would be Rs. 114500.16/-.

SUMMARY

In compliance to the Orders of Hon'ble NGT, it was required to prepare a remediation plan for the excessive mining sites of ordinary earth for the portion of Bundelkhand expressway construction Jalaun district where M/s Gawar Construction Ltd. Was associated as Contractor. In order to prepare the remediation plan for the excessive mining sites, after detailed understanding of the physical and environmental setting of the area coupled with the detailed site visit, it was realized that excessive mining of ordinary earth was the key concern in relation to preparation of the remediation plan in terms of environmental damage that might have taken place. Herein it was noted that in terms of air quality and water, from the perusal of the records, it is evident that no damages had taken place. Similarly, since the mining of ordinary earth was carried out from agricultural fields of individuals with their consent during the fallow conditions, no damage to the flora had taken place as the agricultural fields were devoid of any crops/ vegetation. The only environmental damage that was observed during the field visit was related to likelihood of accelerated erosion owing to the topography.

As the excavation is done vertically downward without creating any slope. It destabilizes the bunds resulting in subsidence, also causing base flow and soil erosion from adjacent field causing damage to farm land and reducing productivity. Apart from this, as the sites where excavation is done for creating ponds, the rainwater from adjoining agricultural land finds way to the pond where the slope is towards the ponds. This resulted in formation of gullies at many of the agricultural fields that adjoin the pond. The remediation plan is required to reinforce the borrow area so as to stop the erosion and create a stable slope with vegetation cover to check base flow and erosion. Accordingly, the spatial data collected from the field visit, was analyzed in available Geo-Platforms Like Arc GIS, Global Mapper, QGIS, apart from that Google earth. All the available khasra maps were geo-processed and the geotagging to photographs was performed. Digital elevation model of the region was created, along with flow accumulation and flow direction raster to have proper visual picture of the region to analyze the natural flow condition.

The concept of remediation plan was to rebuilt the borrow area so as to with stand the natural condition of the surrounding for a long time. Bio Engineering practice offers complete solution to stabilize the slope and check soil erosion. As proper Sloping and benching is not possible in current situation. Vegetation cover under natural condition with proper slope of embankments is the only factor that can maintain the current situation. After providing basic details of various grass planting techniques and vegetative structures, schedule of rates for these measures as per prevailing rates have been provided. Finally, for each of the site detailed remedial plan have been provided along with cost estimates.

The table below provided an overview of the financial implications for implementing these remedial measures.

Sr. No.	Number	Notice No.	Village	Gata Sankhya	Remediation Cost
1	1	1929/Khanij-M.M.C.-30	Kaitheri	365	232591.52
2	2	1930/Khanij-M.M.C.-30	Vardh	459	119176.85
3	3	1931/Khanij-M.M.C.-30	Kharusa	27	138888.37
4	4	1932/Khanij-M.M.C.-30	Kapasi	191/2	168568.61
	5	1932/Khanij-M.M.C.-30	Kapasi	181	109966.31
5	6	1933/Khanij-M.M.C.-30	Girthan	165	185195.83
	7	1933/Khanij-M.M.C.-30	Girthan	138	183267.92
	8	1933/Khanij-M.M.C.-30	Girthan	156	116278.02
	9	1933/Khanij-M.M.C.-30	Girthan	29	111225.03
6	10	1934/Khanij-M.M.C.-30	Vardh	458	177099.13
7	11	1935/Khanij-M.M.C.-30	Girthan	392	139241.85
	12	1935/Khanij-M.M.C.-30	Girthan	103	130951.56
	13	1935/Khanij-M.M.C.-30	Girthan	33	124328.62
8	14	1936/Khanij-M.M.C.-30	Timro	705	65138.6
	15	1936/Khanij-M.M.C.-30	Timro	706	0
	16	1936/Khanij-M.M.C.-30	Timro	707	0
	17	1936/Khanij-M.M.C.-30	Timro	708	0
	18	1936/Khanij-M.M.C.-30	Timro	709	0
9	19	1937/Khanij-M.M.C.-30	Timro	224	165528.97
10	20	1938/Khanij-M.M.C.-30	Timro	605	214063.16
11	21	1939/Khanij-M.M.C.-30	Kapasi	295	73265.79
12	22	1940/Khanij-M.M.C.-30	Kapasi	321	111121.32
13	23	1941/Khanij-M.M.C.-30	Kapasi	134/1	171342.24
14	24	1942/Khanij-M.M.C.-30	Kapasi	215	94216.24
15	25	1943/Khanij-M.M.C.-30	Kapasi	34	62228.6
16	26	1944/Khanij-M.M.C.-30	Girthan	157	93651.2
17	27	1945/Khanij-M.M.C.-30	Girthan	25	135136.91
18	28	1946/Khanij-M.M.C.-30	Vyaspura	220	78019.73
19	29	1947/Khanij-M.M.C.-30	Vyaspura	240	95135.04
20	30	1948/Khanij-M.M.C.-30	Vyaspura	348	174825.62
21	31	1949/Khanij-M.M.C.-30	Vyaspura	325	112928.52
22	32	1950/Khanij-M.M.C.-30	Vyaspura	386/2	101618.86
	33	1950/Khanij-M.M.C.-30	Vyaspura	394/1	130193
23	34	1951/Khanij-M.M.C.-30	Vyaspura	391	0
24	35	1952/Khanij-M.M.C.-30	Vyaspura	407	0
	36	1952/Khanij-M.M.C.-30	Vyaspura	408	0
25	37	1953/Khanij-M.M.C.-30	Vyaspura	400	0
26	38	1954/Khanij-M.M.C.-30	Dakore	2771	69350.92

	39	1954/Khanij-M.M.C.-30	Dakore	2772	124204.62
27	40	1955/Khanij-M.M.C.-30	Dakore	2287	116010.36
28	41	1956/Khanij-M.M.C.-30	Dakore	2259	110951.06
29	42	1957/Khanij-M.M.C.-30	Dakore	2919	111346.37
30	43	1958/Khanij-M.M.C.-30	Dakore	2921	0
31	44	1959/Khanij-M.M.C.-30	Kharusa	247	172145.19
32	45	1960/Khanij-M.M.C.-30	Dakore	2928	114500.16
Total					**4633702.1**

Last task is appropriate execution of the remedial plan, it is felt that the most effective agency to implement the remedial plan would be either **Uttar Pradesh Bhumi Sudhar Nigam, (A Govt. of UP Undertaking)** or the **Environment, Forest and Climate Change Department** of **Govt. of Uttar Pradesh** which can implement the programme under its Agroforestry wing**.**

Annexure -13

GAWAR
Construction Limited
CIN: U70109HR2008PLC037773

GAWAR CONSTRUCTION LIMITED
SF-01, JMD Galleria,
Sector-48, Sohna Road,
Gurgaon - 122001 (Haryana)
Ph (0124) 4854000
Fax (0124) 4854001/02
Web www.gawar.in
E-mail: gcl@gawar.in

GCL/Bundelkhand/F-509/AE/FY2024-25/3706

Date: 20.02.2025

To
The Chief Environmental Officer
Uttar Pradesh Pollution Control Board Circle-2
Gomti Nagar, Lucknow, Uttar Pradesh

Sub: Development of Bundelkhand Expressway (Package-IV) From Baroli Kharka (Dist. Hamirpur) to Saalabad (Dist. Jalaun) (Km 149+000 to Km 200+000) in the State of Uttar Pradesh on EPC Basis. **Environmental Compensation -Reg.**

Ref:

1. **Your letter No. H20005/C-2/NGT/684/24 dated 21.11.2024.**
2. **Your letter no. H20203/C-2/684/24 dt 26.11.2024.**
3. **Our letter No. GCL/Bundelkhand/F-509/AE/FY2024-25/3649 dt. 15.12.24.**
4. **Our Letter No. GCL/Bundelkhand/F-509/AE/FY2024-25/3658, dated 26.12.2024**

Respected sir,

In continuation to our letter mentioned at Sr. No. 4 of reference, we (M/s Gawar Construction Limited, or in short "**GCL**") are again submitting in receipt of the referenced letter bearing No. H20005/C-2/NGT/684/24 dated 21.11.2024 (in short "**referenced Letter**") received on 26.11.2024. Upon receipt, GCL sought time to file our response by 30.12.2024 and in compliance thereof, it is submitting a detailed response to the referenced Letter, for your kind consideration:

1. At the outset, GCL states and submits that the development of Bundelkhand Expressway (Package- IV) Baroli Kharka (District-Hamirpur) to Saalabad (District -Jalaun) (KM 149+0 To 200+000), State-UP (In short, the "**Project**") was completed after obtaining all relevant approvals/permissions/consent. GCL as a responsible corporate entity, has always complied with all applicable laws including in completion of the Project, including laws/ regulations/directives in relation to environment.

2. GCL have obtained CTEs (enclosed as **Annexure 1**) as well as CTOs (enclosed as **Annexure 2**) for the Hot Mix Plant and Ready Mix Plant installed by us i.e. Gawar Construction Limited for Package IV from Baroli Kharka (District-Hamirpur) to Saalabad (District -Jalaun) (KM 149+0 To 200+000) of Bundelkhand Expressway.

3. Also, the Uttar Pradesh Expressways Industrial Development Authority (in short "**UPEIDA**"), as the Project Proponent had obtained Environmental Clearance (in short "**EC**") for the entire Bundelkhand Expressway Project from SEIAA, UP by Letter No. 407/Parya/SEAC/4632-5156/2018 dated 23.11.2019 (enclosed as **Annexure 3**). Since, GCL had undertaken only a part of the Bundelkhand Expressway Project, no separate EC is required to be obtained by GCL, for the work undertaken and completed by GCL, as a Contractor of the Project Proponent i.e., UPEIDA

कार्यालय प्राप्ति रसीद
प्राप्ति दिनांक 24.02.25
प्राप्तकर्ता के हस्ताक्षर
उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड, लखनऊ

4. Further, it is expressly stated in the Specific Conditions to the EC obtained by UPEIDA (at Sr. No. 52) that:

   "Separate NOC and consent of the UPPCB shall be obtained with regards to asphalt plants, crushers, batching plants, hot mix plants etc.".

   In accordance with the above condition, GCL as a Contractor of UPEIDA had obtained NOC and consent from the UPPBC for "asphalt plants, crushers, batching plants, hot mix plants etc." set up by us, for undertaking the portion of Bundelkhand Expressway Project, given to us (as a Contractor) by UPEIDA, as the Project Proponent (Annexure 1 and Annexure 2 above).

5. In addition, at S. No. 24 of the Specific Conditions to the EC granted in favour of the UPEIDA, it is specifically mentioned as follows:

   "The project proponent shall obtain Consent to Establish / operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and Water (Prevention & Control of Pollution) Act, 1974 from the concerned State Pollution Control/Committee".

   It is relevant to state that the UPEIDA as the Project Proponent, had submitted a comprehensive EIA Report for Bundelkhand Expressway 04 Lane Expressway Expandable to 06 Lane. In table 1.2 of the report under heading 'Summary of Statutory Clearance Requirement of the project' **(relevant page attached as Annexure 4)**. It is categorically stated that the NOC/Consent under Air & Water Act for Highway alignment, was to be obtained from UPPCB at pre-construction stage by the UPEIDA.

6. Therefore, being a Contractor (and not as the Project Proponent), GCL is not required to obtain CTE/CTO for the entire Bundelkhand Expressway Project. Since GCL's scope is limited to obtaining CTE/CTO for Hot mix plant, Ready Mix plant, etc. for the Package IV only of the entire project, GCL has complied with the condition applicable to them.

7. The referenced Notice alleges that unauthorized earthwork excavation was undertaken by GCL for the work assigned to them by UPEIDA, without obtaining CTE/CTO from UPPCB. In advertently the workers at site, had carried out earthwork excavation and excessive mining, in few sites. The same was investigated in details by the concerned Mining Officer and the issue stands resolved; hence there is no basis for raising the same issue again (for details please see **Annexure 5**).

8. It is also brought to your kind attention that earthwork for construction of highway projects is exempted from the purview of EC Regulations by OM bearing No. Notification S.O. 1224(E). dated 28th March, 2020 issued by the MOEF&CC which incidentally corresponds to the period of execution of the Bundelkhand Expressway Project. Hence, there was no requirement for obtaining EC/CTE/CTO by GCL for the earthwork.

Regd. Office: DSS - 378, Sector 16-17, Hisar - 125001 (Haryana)
Ph.: (01662) 246117, 250361 Fax: (01662) 248885

9. It is also stated in the referenced Notice that environmental degradation has occurred during earthwork excavation. It is humbly submitted that no environmental degradation has been caused by GCL. Periodical sampling reports for Air, water, noise and soil clearly demonstrates that all parameters were within permissible limits (copies of few of the reports are enclosed as **Annexure 6**).

10. By the referenced Notice, Environmental Compensation has been calculated on the basis of formula derived by Central Pollution Control Board. At the outset, we respectfully submit that all necessary approvals have been obtained by UPEIDA as the Project Proponent and GCL has obtained relevant approvals, as applicable to them. Hence, the work undertaken by GCL as a Contractor of UPEIDA as the Project Proponent, is in compliance with all necessary approvals, consequently there is environmental damage; hence there is no basis for proposal to impose Environmental Compensation. Further, insofar of inadvertent earthwork excavation and excessive mining, at few sites, already compensation of Rs. 1, 29, 50,000/- was imposed and the same has been deposited by GCL on 09.12.2024 (**Annexure 7**). Hence, there is no basis for proposal to impose Environmental Compensation, for the second time.

11. In addition, the proposal to impose Environmental Compensation is erroneous and without basis, as the CPCB in its report has specifically mentioned that the following ***cases can be considered for levying Environmental Compensation (EC):***

a) Discharges in violation of consent conditions, mainly prescribed standards / consent limits.

b) Not complying with the directions issued, such as direction for closure due to non-installation of OCEMS, non-adherence to the action plans submitted etc.

c) Intentional avoidance of data submission or data manipulation by tampering the Online Continuous Emission / Effluent Monitoring systems.

d) Accidental discharges lasting for short durations resulting into damage to the environment.

e) Intentional discharges to the environment -- land, water and air resulting into acute injury or damage to the environment.

f) Injection of treated/partially treated/ untreated effluents to ground water

In our respectful submission the activities carried out by GCL, doesn't fall under any of the above mentioned situation; therefore invocation of CPCB formula for proposal to impose Environmental Compensation, is inapplicable in the present case and any imposition would run contrary to CPCB formula.

12. In addition, by the referenced Letter, we have also been directed to prepare a remedial plan for the inadvertent earthwork excavation and excessive mining, at few sites. GCL is in the process of preparing a remedial plan and we would be submitting the same within 15 days, for your consideration and approval.

13. In view of the above stated submissions and the fact that (i) GCL has obtained CTEs as well as CTOs for Hot Mix Plant and Ready Mix Plant installed by them, (ii) GCL has complied with the Mining Rules as mining of earth was conducted after obtaining due permission from concerned department, (iii) GCL has not caused any environmental degradation as the activities carried out by GCL was diligently monitored by its team of experts, and GCL has maintained wholesomeness of air, water and soil, and (iv) GCL is not required to obtain EC since UPEIDA as the Project Proponent has obtained EC.

14. On 28.10.2024, the CPCB issued directions to the UPPCB to the following effect and we reacted in positive manner as below;

S.No.	Direction	Response of GCL
i	to get assessed the extent of illegal mining at all mining sites from which ordinary earth/soil has been mined for the said expressway construction work in Jalaun district;	It is brought to your kind notice that our subcontractor has deposited the amount of INR 1,29,50,000 as assessed by Mining Deptt on December 9, 2024. A challan dated December 9, 2024 having challan no. AKV240027534 recording the said deposit was also generated/issued. A copy of the payment challan is enclosed as Annexure 1. A copy of the bank statement is enclosed.
ii	to initiate actions immediately for appropriate punitive action as applicable under the law, including levying and realisation of environmental compensation, for violation of provisions of environmental laws as mentioned in above paragraphs, after duly following the principle of natural justice;	As stated in above paras, and Para 13, in view of the above stated submissions and the fact that (i) GCL has obtained CTEs as well as CTOs for Hot Mix Plant and Ready Mix Plant installed by them, (ii) GCL has complied with the Mining Rules as mining of earth was conducted after obtaining due permission from concerned department, (iii) GCL has not caused any environmental degradation as the activities carried out by GCL was diligently monitored by its team of experts, and GCL has maintained wholesomeness of air, water and soil, and (iv) GCL is not required to obtain EC since UPEIDA as the Project Proponent has obtained EC, the referenced Show Cause Notice issued to GCL, may kindly be withdrawn.
iii	to take all necessary actions to ensure that no further illegal mining takes place, and;	Project has already been completed hence no work including earth work mining is at site.
iv	to get prepared a remediation plan by the project proponent for the illegal mining sites where illegal mining has taken place for the said expressway construction work in Jalaun district, in consultation with mining department and UPPCB, and get it implemented by the project proponent in a time bound manner."	Refer this office letter No. GCL/Bundelkhand /F-509/AE/FY2024-25/3686 dated 30.02.2025, we have submitted a remediation plan prepared by Environmental Specialist Dr. Devendra Kumar Agrawal in compliance to directions.

15. Considering compliances as mentions in para 14 and above it is requested that the referenced Show Cause Notice issued to GCL, may kindly be withdrawn. And in the event, your good-self needs any further clarification and/or if your good-self proposes to proceed further based on the referenced SCN, it is prayed that GCL may be granted a personal hearing, with advance notice.

Thanking you.

With regards

For Gawar Construction Limited

Authorized Signatory

Enc: As Above

Copy to:

1. **District Magistrate,** Jalaun for information please.
2. **Regional Officer,** Uttar Pradesh Pollution Control Board Jhansi for information please
3. **Gawar Construction Limited, H.O., Gurugram, Haryana**

Regd. Office: DSS - 378, Sector 16-17, Hisar - 125001 (Haryana)
Ph.: (01662) 246117, 250361 Fax: (01662) 246885

Annexure -14

उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड
UTTAR PRADESH POLLUTION CONTROL BOARD

सदर्भ सं0 Ref. No H-25504 /TA-2/NGT-604/25 दिनाँक Date 10-3-25

पंजीकृत

सेवा में,

मैसर्स गावर कन्सट्रक्शन लिमिटेड,
एस0एफ0–1, जे0एम0डी0 गलेरिया, सेक्टर–48, सोहना रोड,
गुरूग्राम, हरियाण।

विषय– मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस0एफ0–1, जे0एम0डी0 गलेरिया, सेक्टर–48, सोहना रोड, गुरूग्राम, हरियाणा के विरूद्ध पर्यावरणीय क्षतिपूर्ति अधिरोपित किये जाने के सम्बन्ध में।

महोदय,

मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली में योजित ओ0ए0 संख्या 556/2024 (अरूण तिवारी बनाम उत्तर प्रदेश) में आच्छादित परियोजना मेसर्स गावर कन्सट्रक्शन लिमिटेड, एस0एफ0–1, जे0एम0डी0 गलेरिया, सेक्टर–48, सोहना रोड, गुरूग्राम, हरियाणा द्वारा अवैध मिट्टी खनन हेतु वायु (प्रदूषण निवारण तथा नियंत्रण) अधिनियम, 1981 की धारा–21 के अन्तर्गत राज्य बोर्ड से सहमति प्राप्त नहीं किये जाने के फलस्वरूप परियोजना पर दिनांक 15.01.2020 से दिनांक 31.12.2022 तक की अवधि अर्थात 1066 दिनों की डिफाल्टर अवधि हेतु बोर्ड मुख्यालय के पत्रांक एच20005/सी–2/एन0जी0टी0–684/24, दिनांक–21.11.2024 द्वारा रू0 1,33,25,000 (कुल एक करोड़ तैतीस लाख पच्चीस हजार मात्र) की पर्यावरणीय क्षतिपूर्ति अधिरोपित किये जाने हेतु कारण बताओ नोटिस जारी किया गया था। उक्त कारण बताओ नोटिस दिनांक 21.11.2024 के परिप्रेक्ष्य मे आप द्वारा प्रत्यावेदन दिनांक 20.02.2025 को प्रस्तुत किया गया है, जिसके सुसंगत अंश निम्नवत् हैः–

..... 2. GCL have obtained CTEs (enclosed as Annexure 1) as well as CTOs (enclosed as Annexure 2) for the Hot Mix Plant and Ready Mix Plant installed by us i.e. Gawar Construction Limited for Package IV from Barali Kharka (District-Hamirpur) to Saalabad (District-Jalaun) (KM 149+0 To 200-000) of Bundelkhand Expressway.

.....4. Further, it is expressly stated in the Specific Conditions to the EC obtained by UPEIDA (at Sr. No. 52) that:

"Separate NOC and consent of the UPPCB shall be obtained with rogarda to asphsit plants, crushers, batching plants, hot mir plants ofc."

In accordance with the abova condition, GCL as a Contractor of UPEIDA had obtained NOC and consent from the UPPBC for "asphalt plants, crushers, batching plants, hot mix plants etc." set up by us, for undertaking the portion of Bundelkhand Expressway Project, given to us (as a Contractor) by UPEIDA, as the Project Proponent.....

.....13. In view of the above stated submissions and the fact that (1) OCL has obtained GTEs as well as CTOs for Hot Mix Ptant and Danily Mix Plant installed by them, (1) OCE has complied with the Mining Rules as mining of earth was conducted aftor attaining dun permission from concerned department, (ii) GCL has net caused any environmental degradation as the activities carried out by GCL was diligently monitored by its team of experts, and GCL has maintained wholesomeness of air, water and soll, and (iv) GCL is not required to obtain EC since UPEIDA as the Project Proponent has obtained EC.....

उपरोक्तानुसार वर्णित तथ्यों से स्पष्ट है कि आप द्वारा एक्सप्रेस–वे के निर्माण हेतु किये गये मिट्टी खनन हेतु वायु (प्रदूषण निवारण तथा नियंत्रण) अधिनियम, 1981 की धारा–21 के अन्तर्गत राज्य बोर्ड से सहमति प्राप्त नहीं किया गया है। अतः आप द्वारा प्रस्तुत प्रत्यावेदन संतोषजनक न होते हुए निस्तारित किया जाता है।

कारण बताओ नोटिस दिनांक 21.11.2024 के परिप्रेक्ष्य में क्षेत्रीय अधिकारी, झांसी के पत्र दि0 07.03.2025 एवं 31.01.2025 के अनुसार केन्द्रीय प्रदूषण नियंत्रण बोर्ड के पत्र दिनांक 28.10.2024 में वर्णित बिन्दु संख्या–02 के अन्तर्गत जारी निर्देशों के अनुपालन के कम में मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस0एफ0–1, जे0एम0डी0 गलेरिया, सेक्टर–48, सोहना रोड, गुरूग्राम, हरियाणा द्वारा राज्य बोर्ड से मिट्टी खनन हेतु सहमति प्राप्त नहीं किये जाने के दृष्टिगत दिनांक 15.01.2020 से दि0 31.12.2022 तक की अवधि अर्थात 1066 दिनों की डिफाल्टर अवधि हेतु पर्यावरणीय क्षतिपूर्ति अधिरोपित करने हेतु बोर्ड मुख्यालय, लखनऊ के पत्र दिनांक 21.11.2024 द्वारा कारण बताओ नोटिस की पुष्टि करते हुए एवं परियोजना मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस0एफ0–1, जे0एम0डी0 गलेरिया, सेक्टर–48, सोहना रोड, गुरूग्राम, हरियाणा पर रू0 1,33,25,000/– (रू0 एक करोड़ तैतीस लाख पच्चीस हजार मात्र) की पर्यावरणीय क्षतिपूर्ति अधिरोपित किये जाने की संस्तुति की गयी है।

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अतः क्षेत्रीय अधिकारी, झांसी के पत्र दिनांक 07.03.2025 एवं 31.01.2025 द्वारा परियोजना पर पर्यावरणीय क्षतिपूर्ति अधिरोपित किये जाने हेतु प्रेषित संस्तुति आख्या एवं सक्षम स्तर से अनुमोदनोपरान्त मैसर्स गावर कन्सट्रक्शन लिमिटेड, एस0एफ0–1, जे0एम0डी0 गलेरिया, सेक्टर–48, सोहना रोड, गुरूग्राम, हरियाणा पर धनराशि रू0 1,33,25,000/–(रू0 एक करोड़ तैतीस लाख पच्चीस हजार मात्र) पर्यावरणीय क्षतिपूर्ति के रूप में अधिरोपित किया जाता है तथा निर्देशित किया जाता है कि उक्त पर्यावरणीय क्षतिपूर्ति की धनराशि विलम्बतम् 15 दिवस में निम्नलिखित Payment Gateway एवं विविरण के माध्यम से जमा किया जाना सुनिश्चित किया जायेः–

Payment Gateway- http://erp.eshiksa.net/DirectFeesv3/UPPCB
Nature of Pollution-Air Pollution
EC imposed in Compliance-UPPCB Order

सक्षम अधिकारी के अनुमति से निर्गत।

Atulesh yadav
मुख्य पर्यावरण अधिकारी (वृत्त–2)

प्रतिलिपि :–

1. जिलाधिकारी, जालौन को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।
2. क्षेत्रीय अधिकारी उ0प्र0 प्रदूषण नियंत्रण बोर्ड, झांसी को इस निर्देश के साथ कि उद्योग से पर्यावरणीय क्षतिपूर्ति की धनराशि निर्धारित समयावधि में प्राप्त न होने की स्थिति में भू–राज्स्व की भांति वसूली की कार्यवाही हेतु प्रस्ताव जिलाधिकारी के समक्ष प्रस्तुत किये जाने की कार्यवाही सुनिश्चित की जायें।

Atulesh yadav
मुख्य पर्यावरण अधिकारी (वृत्त–2)