BEFORE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI
ORIGINAL APPLICATION NO. 593 OF 2023

IN THE MATTER OF:

Mursaleen …. Applicant

versus

State of Haryana & Ors. …. Respondents

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PLACE – NEW DELHI
DATE - 04.11.2025

BEFORE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI
ORIGINAL APPLICATION NO. 593 OF 2023

IN THE MATTER OF:

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versus

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RESPONSE ON BEHALF OF RESPONDENT NO. 18 – M/S M.P. TRADERS TO THE OBJECTION DATED 06.08.2024, FILED BY THE APPLICANT MURSALEEN.

MOST RESPECTFULLY SHOWETH:

1. That the Respondent no. 18 - M/s M.P. Traders is filing the present Response to the Objection/Reply dated 06.08.2024 filed by the Applicant-Mursaleen.
2. That the above captioned matter is filed by the present Applicant namely Mursaleen against various Project Proponent alleging that, including Respondent No. 18 ***(hereinafter to be referred as the 'answering Respondent')***, Project Proponents made rampant mining operations and excessive/illegal Sand, Bajri and Boulder (BGS) Mining in District Yamuna Nagar, Haryana and further, alleged that answering Respondent is operating without the required/requisite documents by the concerned authorities. That the Reply to the Original Application has already been filed by the answering Respondent on 19.03.2024. That the facts and circumstances of the case have been described in the Reply dated 17.03.2024 filed by the answering Respondent and the same are not repeated herein for the sake of brevity and in order to avoid

repetition. The Respondent craves the leave of this Hon'ble Tribunal to refer and rely upon the same for the purpose of deciding the present Petition.

3. That the SEIAA, Haryana filed the report dated 24.06.2024 in the captioned matter in compliance of the order dated 30.05.2024 passed in the captioned matter.

4. Thereafter Applicant filed the objection dated 06.08.2024 to the SEIAA, Haryana report dated 24.06.2024 and raised the following objections with respect to the answering Respondent:

> a). No approved Replenishment study for years 2022 (Post Monsoon) and for 2023.
> b). Replenishment study allegedly after the Order of Tribunal in the present OA by private organization (Non NABET approved)
> c). Mining beyond lease area

Issue with respect to No approved Replenishment study for years 2022 (Post Monsoon) and for 2023.

5. It is submitted that the answering Respondent in accordance with the guidelines gets studied the replenishment from time to time in order to ascertain the quantity of material replenished. That the answering Respondent has already annexed the replenishment study of the year 2023 (Pre and post monsoon) as **ANNEXURE R-2** in the Reply dated 17.03.2024. That the answering Respondent in accordance with the guidelines gets studied the replenishment study of the year 2019, 2020, 2021 and 2022 as well.

   A copy of the relevant pages of the replenishment study of year 2019, 2020, 2021 and 2022 is annexed herewith and marked as **ANNEXURE-1 (Colly).**

Issue with respect to Replenishment study allegedly after the order of Tribunal in the present OA by private organization (Non NABET approved)

6. It is submitted that Point no.5 of the Enforcement & Monitoring Guidelines for Sand Mining 2020 ***(hereinafter referred as ENGSM 2020)*** deals with Replenishment Study. That the Replenishment Study gets done by the NABET approved consultant is not mentioned in the ENGSM 2020. It is further submitted that replenishment study has been prepared by the JBB Technocrat Pvt. Ltd. which is an **ISO: 9001:2015** certified. That the Dr. S.N. Sharma is the director of the JBB Technocrat Pvt. Ltd. That the Dr. S. N. Sharma is the Ex-Head of Mining & Geology, Haryana Minerals Limited, Government of Haryana and members of the various institutes and possess the following qualifications:
   - Ph.D. (Entrepreneurship), 2022
   - Bachelor of Engineering (Mining) University of Jodhpur, Jodhpur (India), in 1981.
   - First Class Certificate of Competency for Opencast Mining - FCC(R), in 1990, Directorate General of Mines Safety, Government of India.
   - Recognized Qualified Person (QP) for Mining, from Indian Bureau of Mines, Government of India.
   - Life Member – Mining Engineers Association of India (LM No.5062 ND).
   - Life Member - Society for Mining, Metallurgy and Exploration (SME), USA. (No. 4550149720)

Issue with respect to Mining beyond lease area

7. It is submitted that the Applicant has relied on the Report of the Comptroller and Auditor General of India, bearing no. 4 of 2019

(hereinafter referred to as "CAG Report 2019"), which was only for the year ended 31.03.2018, Revenue year 2017-18. That on 09.04.2018 Ministry of Environment, Forest & Climate Change Impact Assessment Division, Government of India granted Environment Clearance, bearing **F. No. J-11015/214/2016-IA. II (M)** to the answering Respondent. It is further submitted that the CAG Report 2019 is not applicable in the case of answering Respondent because mining was not being carried out by the answering Respondent at the time when CAG Report 2019 was prepared**.**

8. It is further submitted that no illegal mining beyond lease area is being carried out by the answering Respondent. That the SEIAA, Haryana in its Report dated 24.06.2024 found that there is no violation being done by the answering Respondent.
9. It is submitted that Applicant has filed the objection after the final argument advanced by the counsel for the Applicant and counsel for the Respective Respondents and the Judgment reserved by this Hon'ble Tribunal *vide* order 30.05.2024 dated. That the Applicant is only enlarging the scope of the Original Application. That the Applicant cannot enlarge the scope of the Original Application once the judgement is reserved after hearing counsel for the Applicant and counsel for the Respective Respondents at length. It is further submitted that mining activities is being carried out by complying the guidelines of EIA notification 2006, SSMG 2016 and EMGSM, 2020 issued by the MOEF.
10. That, in view of the above facts and circumstances of the case and the answering Respondent has a good case on merits and the Original Applicant has made bald allegation without any proofs/evidence to substantiate its allegation hence, the present

original Application may be dismissed with cost as mere allegations have been made without any cogent proof qua the answering Respondent.

11. That the supporting Affidavit is being filed along with this Response.

FILED BY

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PLACE – NEW DELHI
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BEFORE THE NATIONAL GREEN TRIBUNAL PRINCIPAL BENCH, NEW DELHI
ORIGINAL APPLICATION NO. 593/2023

IN THE MATTER OF:
MURSALEEN ...APPLICANT

VERSUS

STATE OF HARYANA & ORS. ...RESPONDENTS

AFFIDAVIT

I, Vedpal Mandhan, S/o Man Singh, Aged About 54 Years, R/o. Near Nirankari Colony, Karnal Road, Indri Karnal, Haryana – 132041, do hereby solemnly affirm and declare as under:

1. That I am the Respondent no.18 in the instant Original Application and I am well conversant with the facts and circumstances of the case and thus competent to swear this affidavit.

2. That the accompanying objections have been drafted under my instructions, which I have read and understood. I further state that the averments made therein are true and correct to my knowledge and belief.

3. That the Annexures filed along with the objections are true copy of their respective originals.

DEPONENT

VERIFICATION

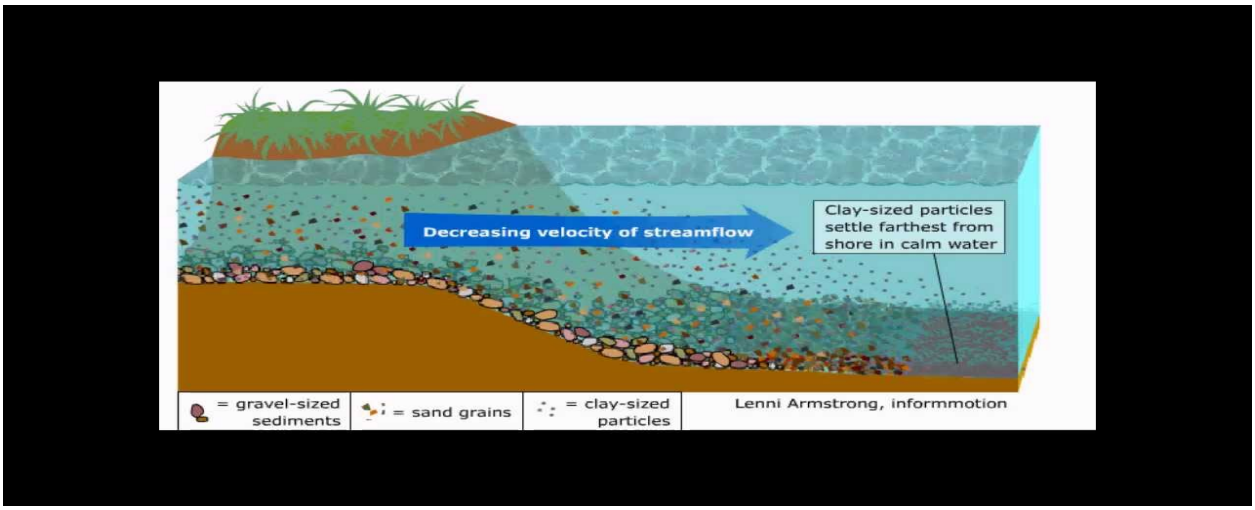
Verified at _____, on this___day of November 2025 that the contents of my aforesaid affidavit are true and correct to my knowledge and belief. No part of it is false nor anything material has been concealed therefrom.

DEPONENT

ATTESTED
NOTARY PUBLIC
KARNAL-132001

04 NOV 2025

REPLENISHMENT STUDY REPORT
FOR
SAND MINE (MINOR MINERAL)
NAGLI BLOCK (YNR B-15)
{Lease Area: 77.25 Ha, Production Capacity: 22.40 Lac T/Annum}
PERIOD: 2019 (Pre-Monsoon: June-2019 & Post-Monsoon-Oct-2019`



Prepared By: JBB TECHNOCRAT PVT LTD, NCR REGION, FARIDABAD, HARYANA November-2019
{CIN No. 06AVPAS5608RIZZ}
(Waste Management, Environment and Mining Solutions Consulting)
ISO: 9001:2015 Certified
www.jbbtechnocrat.com

SUBMITTED TO:

REGIONAL OFFICER,
HARYANA STATE POLLUTION CONTROL BOARD, YAMUNANAGAR (HARYANA)

SUBMITTED BY:

M/S M.P.TRADERS,
Karnal Road, Indri,
District:Yamuna Nagar (Haryana)

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SUBJECT: REPORT ON REPLENISHMENT STUDY FOR RIVER BED MINING PROJECT OF MINOR MINERAL SAND OF NAGLI BLOCK-B-YNR-15, YAMUNANAGR (HARYANA) OF M/S MP TRADERS

References:

a) Environmental Clearance vide letter no. F.No. J-11015/214/2016-IA.II(M) dated 09th April, 2018

1) The Project :

M/s M.P. Traders, (Shri VedpalMandhan), Near Nirankari Colony, Indri, District:Yamunanagar (Haryana) owns mining lease hold area of Sand (Minor Mineral) of 77.25 hectares with proposed production capacity of 22.4 Lakh TPA (ROM). The mine lease area is located at Nagli Block, Yamuna Nagar B-15, Tehsil Radaur, District :Yamuna Nagar, State : Haryana.The mine lease area lies on river bed of Yamuna River.

The co-ordinates of Mine Lease area are- latitude and longitude: Pillar No. A-N 29° 58' 29" E 77° 13' 47" Pillar No. B -N 29° 58' 30" E 77° 13' 50.5" Pillar No. C- N 29° 58' 16" E 77° 13' 48.5" Pillar No. D- N 29° 58' 02" E 77° 13' 46" Pillar No. E- N 29° 58' 02" E 77° 13' 45" Pillar No. F- N 29° 57' 38" E 77° 13' 45" Pillar No. G- N 29° 57' 24" E 77° 13' 37" Pillar No. H- N 29° 57' 38" E 77° 13' 13" Pillar No. I- N 29° 57' 40" E 77° 13' 20.5" Pillar No. J- N 29° 57' 46" E 77° 13' 27" Pillar No. K- N 29° 58' 06" E 77° 13' 28" Pillar No. L- N 29° 58' 10" E 77° 13' 32" Pillar No. M- N 29° 58' 10" E 77° 13' 39" Pillar No. N- N 29° 58' 15" E 77° 13' 43" Pillar No. O- N 29° 58' 15" E 77° 13' 42" Pillar No. P- N 29° 58' 25" E 77° 13' 42"

2) Objective for Replenishment Study

The requirements of the "Replenishment Study" as per the terms of EC letter are as below : Sr. No, 8 of EC :The proponent submitted that before starting the mining operation, initial level(baseline data) of the mining site will be taken, for this purpose section will be cut at 30 meter interval along the length of the river and at each section line levels will betaken at an interval of 5-20 meters depending on the width of the river. Theproponent submitted that the baseline data so collected will be submitted to theMinistry within one month of the grant of EC. The proponent submitted that forannual replenishment study reputed institute/Government agency will be engaged. Additional Conditions of EC (A-vi) :The Project Proponent shall appoint a Monitoring Committee to monitor the replenishment

study, traffic management, levels of production,river Bank erosion and maintenance of Road etc. The proponent should carry out replenishment study annually to ascertain the quantity of material replenished and production should not be more than the quantity replenished. In case the material replenished is more than the quantity mentioned in this Environmental Clearance then quantity that can be excavated is limited to 22.4 Lakh TPA (ROM). The proponent will submit the replenishment study report to Regional Office, MoEF&CC every year. The proponent should carry out a comprehensive replenishment study considering data collected at same location and at same time for at least three years and same needs to be submitted to Regional Office, MoEF&CC after every three years;

3) Period of Replenishment Study (2019)

a) The Pre-monsoon Period: June- 2019

b) The Post-Monsoon Period : Oct-2019

4) Need for present Annual Replenishment Study

- As per Additional Conditions of EC (A-vi) , the Project Proponent should carry out replenishment study annually to ascertain the quantity of material replenished.

- The proponent will submit the replenishment study report to Regional Office, MoEF&CC every year. The proponent should carry out a comprehensive replenishment study considering data collected at same location and at same time for at least three years and same needs to be submitted to Regional Office, MoEF&CC after every three years;

To fulfill to objective of the replenishment study and to comply with the terms of Environmental Clearance (EC) letter conditions the Project Proponent constituted "Monitoring Committee" of following experts for this purpose :

i)	S.N. Sharma	:	Mining Expert
ii)	Yogeshwar P Mishra	:	Environmental Expert
iii)	Arafat Khan	:	GIS cum Survey Expert
iv)	S.C. Prasad	:	Mine Manager

In addition to above, Project Proponent (M/S MP Traders) appointed M/S JBB Technocrat Private Limited, Faridabad (Haryana), an Environmental Consulting Company for undertaking :

a) Pre-monsoon survey and replenishment study
b) Post-monsoon survey and replenishment study
c) To prepare composite sections of pre and post monsoon survey findings
d) To calculate the volume of sand replenished during study period.
e) Finally to prepare "Replenishment Study Report" and to submit it to the Regional Office, MoEF&CC.

5. Replenishment Study

5.1 General Introduction:

Sediment is a naturally occurring material that is broken down by processes of weathering and erosion, and is subsequently transported by the action of wind, water, or ice or by the force of gravity acting on the particles

Sand is an essential minor mineral used extensively across the country as a useful construction constituent and variety of other uses in sports, agriculture, glass making (a form of sand with high silica content) etc. It is common knowledge that minerals are Non-renewable but this form of mineral naturally gets replenished from time to time in a given river system and is very much interrelated to the hydrological cycle in a river basin. But its over-exploitation and indiscriminate mining supersedes replenishment &optimum extraction is overtaken by profits, extraction has exceeded its replenishment rate and it neglects laws of mineral conservation.

Sand mining has become a widely spread activity and does not require a huge set up or technology, the number of ventures has increased extensively and it has become a footloose industry in itself but the backward-forward linkages are becoming stronger as many are getting employed as well as the construction activity / industry requires this mineral at consistent rates. In the state of Punjab, sand has been declared as an essential commodityso as to control its extraction and sale price. Andhra Pradesh on the other hand is heading towards a lottery system1. Riverine environmental systems are unique in them and provide environmental services, natural resources to meet variety of needs of urban and rural communities. The Rivers originating from the Himalayas bring with them lots of aggregate materials whereas as they move downstream, only finer elements / minerals like sand are found in abundance. Rivers also

act as natural administrative boundariesamong the states and this gives rise to improper and unclear demarcation of boundaries as the river keeps changing its course from time to time thereby unclear administrative controls and mechanisms becomes a point of excuse for administration for any illegal activity taking in this disputed area. River Yamuna near Dakpathar barrage leaves Uttarakhand and enters Himachal Pradesh.

The YAMUNA RIVER is the biggest tributary of the river Ganga in North India. Its source in the Yamunotry glacier at an elevation of 6387 mtrs on South western sides of Banderpooch crests in the lower Himalayan ranges. The overall span of the Yamuna river is 1376 Kms (855 miles) with catchment area of 366223 square km (141,399 square km). This encompasses 40.2 % of the whole Ganga valley, prior to joining Ganga at TriveniSangam in Allahabad (UP)

Itinerary of Yamuna River:

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

Itinerary of Drainage area of Yamuna:

The origin of Yamuna is situated in the Yamunotri glacier at an elevation of 6387 mtrs on SE sides of Banderpooch crests, which are located in the Mussoorie range of lower Himalayan range in Uttrakashi district of Uttrakhand, to the North of Haridwar. From this place Yamuna runs to South around 200 Kms across the Shivalik mountain ranges and lower Himalayan ranges.

A significant portion of its beginning of Drainage basin (with total area of 2320 square km) is situated in HP and a major tributary sapping the upper drainage basin in the Tons, which is also biggest and most extensive tributary of the Yamuna. Other tributaries in the area are the Rishi Ganga, Giri, Hanuman Ganga, Kunta& Bata, which sap the upper drainage basin of the huge Yamuna river. Subsequently, the river moves down the terrains of Doon basin at DakPatharclose to Dehradun, in this place water is redirected into a channel for the purpose of electricity generation. Once it goes across the sikh religious place of Ponta Sahib, the river arrives at Tajewala in the YAMUNANAGAR district of Haryana where a dam was constructed in 1873. This dam is the origin of the two major channels or water courses – Eastern Yamuna Canal and Western Yamuna Canal and both drain in UP & Haryana.

The Western Yamuna Canal (WYC) traverses Karnal, Yamunanagar and Panipat prior to arriving at the Haiderpur water treatment plant, which provides a portion of municipal water provisions of Delhi. The Yamuna also forms natural boundary between the states of Uttrakhand& HP and also amid the states of UP and Haryana.

Together with the Ganga to which it flows almost parallel once it meets the Indo-Gangetic plateau, the biggest Alluvial productive area in the World, it forms the Ganges-Yamuna Doab are stretched across 69,000 square Km which is 33% of the whole area.

Drainage system is the pattern formed by streams, rivers and lakes in a drainagebasin. In a drainage system, streams or rivers always connect together to formnetworks. Many factors such as topography, soil type, bedrock type, climate &vegetation cover influence input, output and transport of sediment and water in adrainage basin (Charlton, 2008). These factors also influence the nature of thepattern of water bodies (Twidale, 2004). As a consequence, drainage pattern canreflect geographical characteristics of a river network to a certain extent. There areseveral types of drainage pattern. So far, much research has been done on thedescription of drainage patterns in geology and hydrology (e.g. Howard, 1967;Lambert, 1998; Twidale, 2004; Pidwirny, 2006).

In addition, sediment transport knowledge is important in river restoration, ecosystem protection, navigation, watershed studies and reservoir management. Bed load represents the lower portion of sediment load in natural rivers. Fluvial sediment load materials are transported by rivers. Sediment load can be divided into bed load and suspended load based on the mode of transport. Bed load is transported close to the bed where particles moved by rolling, sliding, or dissolving(Adegbola, 2012). Xlaoqing (2003) explained that bed load transport in naturalrivers is a complicated event. Its movement is quite uneven in both the transverse & longitudinal directions, which vary considerably.

5.2 Physiography:

The area forms a part of the Indo-Gangetic plains and exhibit flat terrain with general slope from north to south. The area is devoid of any prominent topographic features. However, a natural depression exists in north & northwest of Gohana(29˚08′22″N & 76˚42′55″E). The maximum elevation of the plain is 230m above mRL. Topographically the district can be divided into the following units.

Active flood plains along the present day course of the river Yamuna in eastern part of the district. These are generally bordering the active flood plains and are wider, low lying flat tracts.

5.3 Drainage:

The Yamuna which marks the eastern boundary of the Haryana State as well as Sonipat district provides the major drainage in the area. The River Yamuna emerges from Yamnotri off the Bansur-Punch glacier in TehriGarhwal district of Uttarakhand at an elevation of 6330 meters. It emerges into the plains from the foothills at Kalesar just north of Tajewala. The area constitutes alluvial plain without any conspicuous topographical features and forms a part of the vast Indo-Gangetic plain. The general slope of the area is southwards.

The Yamuna Rivers are plays an important role for the nation and provide water required by various sectors such as irrigation, drinking, recreation and industrial requirements etc. Besides, mining activities are also being carried out in the rivers for the developmental process. Di-siltation (remove of excess sand and stone from river bed) of the river helps to maintain the carrying capacity and provides protection from flooding during monsoon season. Further, continuous flow of river is essential for ecological and economic needs such as irrigation and biodiversity etc. Drainage study of the river helps to understand potential carrying capacity of water during pre-monsoon& post monsoon season which is generated from rainfall in the watershed and quantity of di-siltation of rivers under mining affected areas. Drainage and replenishment study was carried out in Yamuna River, Haryana was found with ephemeral streams. Quantification and estimation of river bed material (RBM) was accomplished by followed three scientific approaches i. e. mapping of watersheds by using Arc GIS software & and ERDAS software using analysis, survey of proposed mining area and grain size distribution of sand and gravel.

5.4 Sedimentation. Assessment and Infrastructure

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

these basin wide characteristics which should become part of the 'Terms of Reference'. **sedimentation,** in the geological sciences, process of deposition of a solid material from a state of suspension or solution in a fluid (usually air or water). Broadly defined it also includes deposits from glacial ice and those materials collected under the impetus of gravity alone, as in talus deposits, or accumulations of rock debris at the base of cliffs. The term is commonly used as a synonym for sedimentary petrology and sedimentology.

The physics of the most common sedimentation process, the settling of solid particles from fluids, has long been known. The settling velocity equation formulated in 1851 by G.G. Stokes is the classic starting point for any discussion of the sedimentation process. Stokes showed that the terminal settling velocity of spheres in a fluid was inversely proportional to the fluid's viscosity and directly proportional to the density difference of fluid and solid, the radius of the spheres involved, and the force of gravity. Stokes' equation is valid, however, only for very small spheres (under 0.04 millimetre [0.0015 inch] in diameter) and hence various modifications of Stokes' law have been proposed for nonspherical particles and particles of larger size.

No settling velocity equation, however valid, provides a sufficient explanation of even the basic physical properties of natural sediments. The grain size of the clastic elements and their sorting, shape, roundness, fabric, and packing are the results of complex processes related not only to the density and viscosity of the fluid medium but also to the translational velocity of the depositing fluid, the turbulence resulting from this motion, and the roughness of the beds over which it moves. These processes also are related to various mechanical properties of the solid materials propelled, to the duration of sediment transport, and to other little-understood factors.

Sedimentation is generally considered by geologists in terms of the textures, structures, and fossil content of the deposits laid down in different geographic and geomorphic environments. Great efforts have been made to differentiate between continental, near-shore, marine, and other deposits in the geologic record. The classification of environments and criteria for their recognition is still a subject of lively debate. The analysis and interpretation of ancient deposits has been advanced by the study of modern sedimentation. Oceanographic and limnologic expeditions have shed much light on sedimentation in the Gulf of Mexico, the Black Sea, and the Baltic Sea, and in various estuaries, lakes, and fluvial basins in all parts of the world.

Chemical sedimentation is understood in terms of chemical principles and laws. Although the famous physical chemist J.H. van't Hoff applied the principles of phase equilibria to the problem of crystallizing brines and the origin of salt deposits as early as 1905, little effort was made to apply physical chemistry to the problems of chemical sedimentation. More recently, however, there has been investigation of the role of the redox (mutual reduction and oxidation) potential and pH (acidity–alkalinity) in the precipitation of many chemical sediments, and a renewed effort has been made to apply known thermodynamic principles to the origin of anhydrite and gypsum deposits, to the chemistry of dolomite formation, and to the problem of the ironstones and related sediments.

The factors which affects the "Computation of Sediment" :-

a) Geomorphology & Drainage Pattern : The following geomorphic units plays important role :
   - Structural Plain
   - Structural Hill
   - Structural Ridge
   - Denudation Ridge & Valley
   - Plain & Plateau of Gangetic plain
   - Highly Dissected pediment
   - Un dissected pediment

b) Distribution of Basin Area River wise (Area in Sq. Km or Sq. Miles)

c) Drainage System/Pattern of the area (Drainage Density = …….Km/Sq. Km of Yamuna River

d) Rainfall & Climate : Year wise Rainfall data for previous 10 years of Yamuna Basin/River

e) As per Dandy & Bolton study "Sediment Yield" can be related to i) Catchment Area and ii) Mean Annual Run-off

6. Approach & Methodology Followed for Replenishment Study of Nagli Block B-YNR-15 (Minor Mineral Sand Mine):-

a) Pre-monsoon survey of River bed with the help of GPS and Drone

b) Grid pattern 30 m x 20 m (30 m along the length of the river and 20 m along width of the river) or part thereof.

c) To draw pre-monsoon contour map (Base map considered as per approved mining plan)

d) Post-monsoon survey of River bed with the help of GPS and Drone

e) Same Grid pattern (30 m x 20 m) or part thereof was considered for survey.

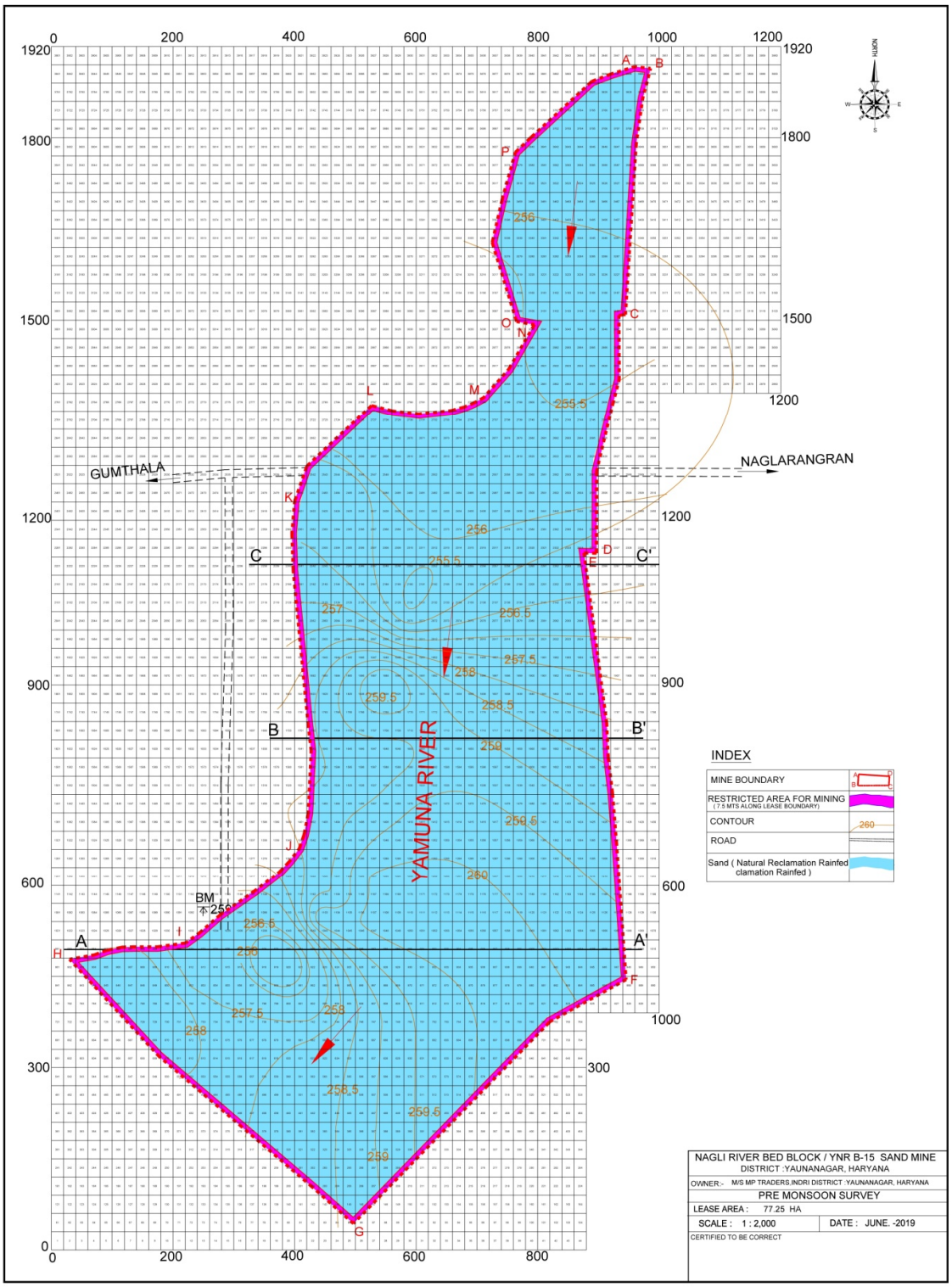
f) To draw post-monsoon contour map (Base map considered as per approved mining plan)

g) To draw composite sections of Pre and post monsoon maps. This will determine the depth and volume of sand replenished.

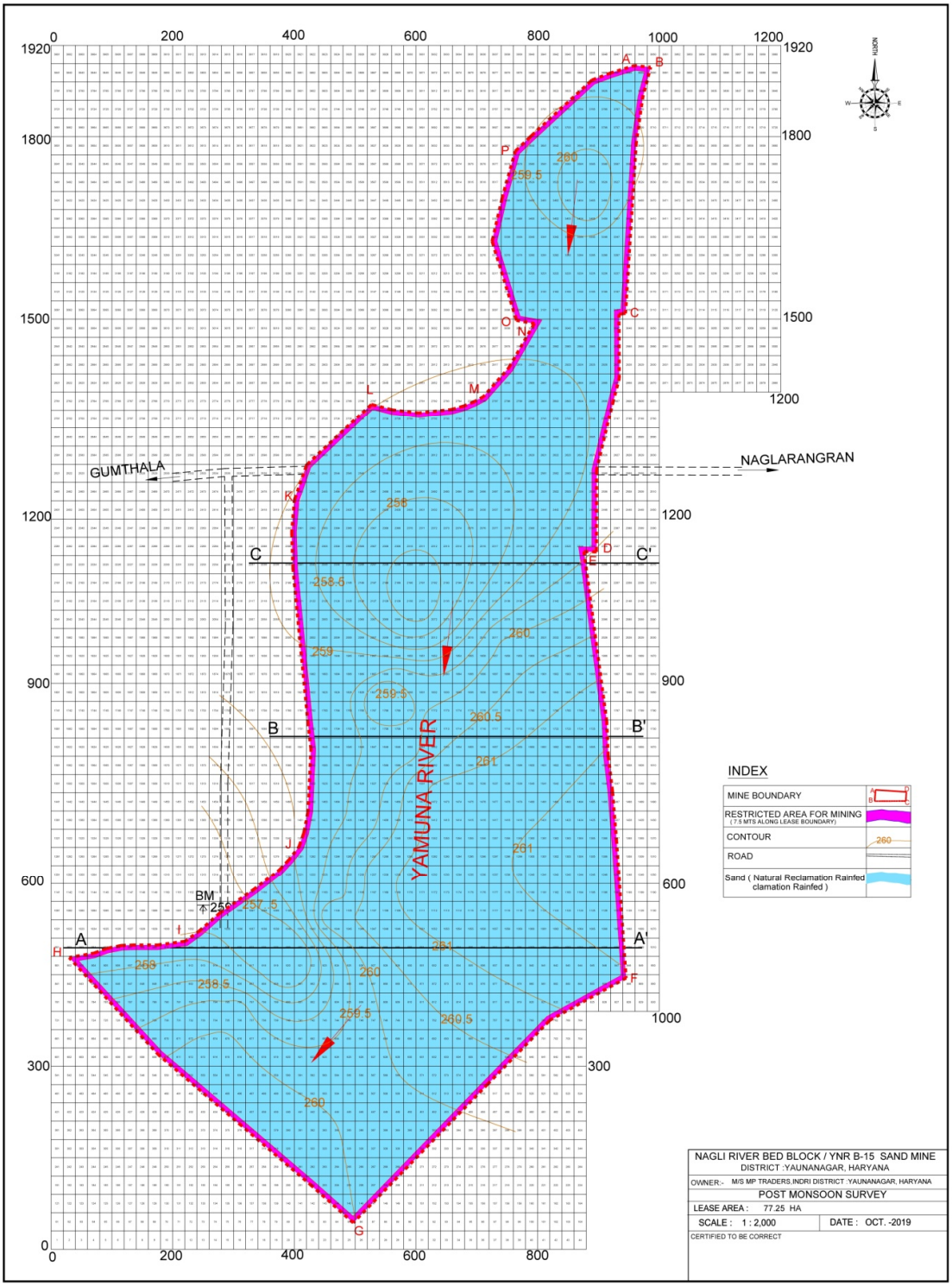
h) Finally to calculate the volume of sand with grid pattern of 30 m x 20 m multiplied by depth of replenishment.

i) The tonnage of replenishment will be volume of sand multiplied by density of sand (which is 2 T per Cubic m)

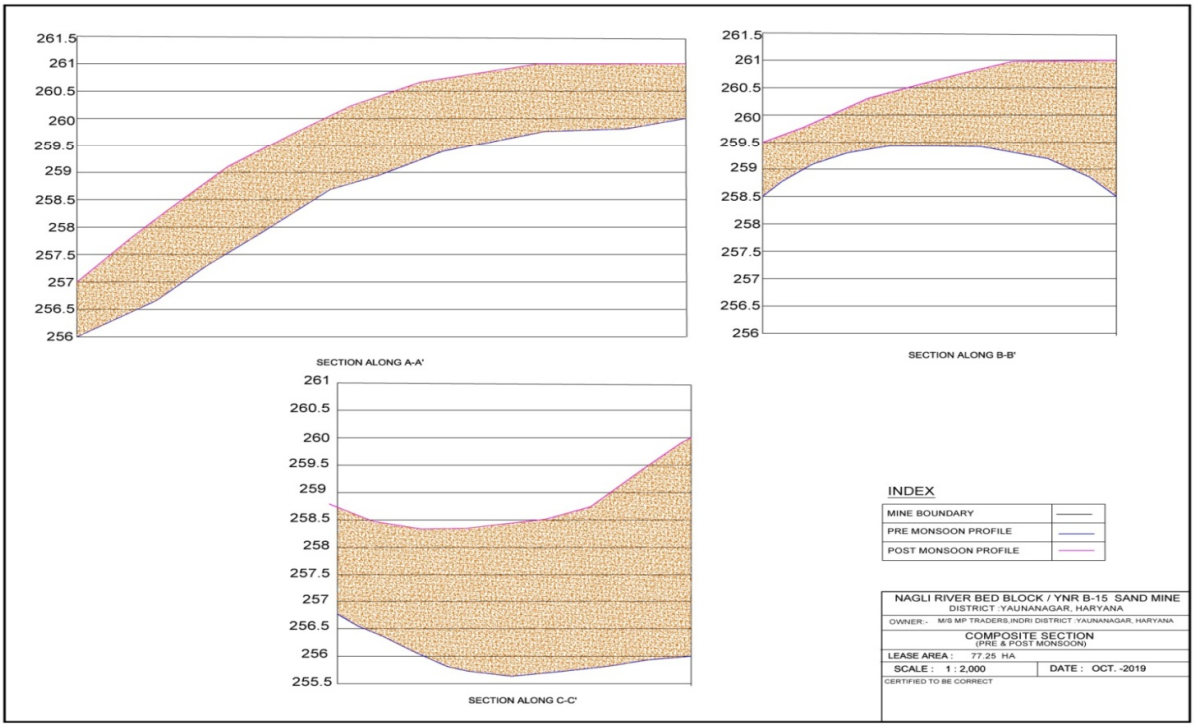
a) Pre-monsoon Contour Map (Grid Pattern : 30m x 20m or Part Thereof))



b) Post-monsoon Contour Map (Grid Pattern : 30m x 20m or Part Thereof)



c) Composite section of Pre and Post Monsoon Contour Map



a) Tonnage calculation of Sand Replenished.

S.r.	Grid Number	Pre-Monsoon Elevation	Post-Monsoon Elevation	Grid Area	Difference of elevation Pre And Post Monsoon contour levels (in m)	Tonnage (in MT)
1	85	258.5	260	300	1.5	900
2	86	258.5	260	300	1.5	900
3	143	258.5	260	300	1.5	900
4	144	258.5	260	300	1.5	900
5	145	258.5	260	600	1.5	1800
6	146	258.5	260	300	1.5	900
7	147	259	260	300	1	600
8	201	258.5	260	300	1.5	900
9	202	258.5	260	300	1.5	900
10	203	258.5	260	300	1.5	900
11	204	258.5	260	600	1.5	1800
12	205	258.5	260	600	1.5	1800
13	206	258.5	260	600	1.5	1800
14	207	259	260	600	1	1200
15	208	259	260	300	1	600
16	209	259	260	300	1	600
17	259	258	260	300	2	1200
18	260	258	260	300	2	1200
19	261	258.5	260	300	1.5	900
20	262	258.5	260	600	1.5	1800
21	263	258.5	260	600	1.5	1800
22	264	258.5	260	600	1.5	1800
23	265	258.5	260	600	1.5	1800
24	266	258.5	260	600	1.5	1800
25	267	259	260	600	1	1200

1370	3826	256	259	600	3	3600
1371	3827	256	259	600	3	3600
1372	3828	256	259	600	3	3600
1373	3829	256	259	300	3	1800
1374	3885	256	259	300	3	1800
1375	3886	256	259	300	3	1800
1376	3887	256	259	300	3	1800
1377	3888	256	259	300	3	1800
1378	3889	256	259	300	3	1800
1379	3890	256	259	300	3	1800
					Total	2868000

Conclusion

Replenishment Study for the year 2019 reveals that there is replenishment (Natural Reclamation Rainfed Water Containing Sand) of approximately 28, 68,000 MT of sand.

d) Site Photographs

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SUBJECT: REPORT ON REPLENISHMENT STUDY FOR RIVER BED MINING PROJECT OF MINOR MINERAL SAND OF NAGLI BLOCK-B-YNR-15, YAMUNANAGR (HARYANA) OF M/S MP TRADERS FOR THE PERIOD OF 2020

References:

a) Environmental Clearance vide letter no. F.No. J-11015/214/2016-IA.II(M) dated 09th April, 2018

1) The Project :

M/s M.P. Traders, (Shri VedpalMandhan), Near Nirankari Colony, Indri, District:Yamunanagar (Haryana) owns mining lease hold area of Sand (Minor Mineral) of 77.25 hectares with proposed production capacity of 22.4 Lakh TPA (ROM). The mine lease area is located at Nagli Block, Yamuna Nagar B-15, Tehsil Radaur, District :Yamuna Nagar, State : Haryana. The mine lease area lies on river bed of Yamuna River.

The co-ordinates of Mine Lease area are- latitude and longitude: Pillar No. A-N 29° 58' 29" E 77° 13' 47" Pillar No. B -N 29° 58' 30" E 77° 13' 50.5" Pillar No. C- N 29° 58' 16" E 77° 13' 48.5" Pillar No. D- N 29° 58' 02" E 77° 13' 46" Pillar No. E- N 29° 58' 02" E 77° 13' 45" Pillar No. F- N 29° 57' 38" E 77° 13' 45" Pillar No. G- N 29° 57' 24" E 77° 13' 37" Pillar No. H- N 29° 57' 38" E 77° 13' 13" Pillar No. I- N 29° 57' 40" E 77° 13' 20.5" Pillar No. J- N 29° 57' 46" E 77° 13' 27" Pillar No. K- N 29° 58' 06" E 77° 13' 28" Pillar No. L- N 29° 58' 10" E 77° 13' 32" Pillar No. M- N 29° 58' 10" E 77° 13' 39" Pillar No. N- N 29° 58' 15" E 77° 13' 43" Pillar No. O- N 29° 58' 15" E 77° 13' 42" Pillar No. P- N 29° 58' 25" E 77° 13' 42"

2) Objective for Replenishment Study

The requirements of the "Replenishment Study" as per the terms of EC letter are as below :Sr. No, 8 of EC :The proponent submitted that before starting the mining operation, initial level(baseline data) of the mining site will be taken, for this purpose section will be cut at30 meter interval along the length of the river and at each section line levels will betaken at an interval of 5-20 meters depending on the width of the river. Theproponent submitted that the baseline data so collected will be submitted to theMinistry within one month of the grant of EC. The proponent submitted that forannual replenishment study reputed institute/Government agency will be engaged.Additional Conditions of EC (A-vi) :The Project Proponent shall appoint a Monitoring Committee to monitor the replenishment

study, traffic management, levels of production,river Bank erosion and maintenance of Road etc. The proponent should carry out replenishment study annually to ascertain the quantity of material replenished and production should not be more than the quantity replenished. In case the material replenished is more than the quantity mentioned in this Environmental Clearance then quantity that can be excavated is limited to 22.4 Lakh TPA (ROM). The proponent will submit the replenishment study report to Regional Office, MoEF&CC every year. The proponent should carry out a comprehensive replenishment study considering data collected at same location and at same time for at least three years and same needs to be submitted to Regional Office, MoEF&CC after every three years;

3) Period of Replenishment Study (2020)

a) The Pre-monsoon Period: 11 to 13th June- 2020

b) The Post-Monsoon Period : 8 to 10thOctober-2020

4) Need for present Annual Replenishment Study

- As per Additional Conditions of EC (A-vi) , the Project Proponent should carry out replenishment study annually to ascertain the quantity of material replenished.

- The proponent will submit the replenishment study report to Regional Office, MoEF&CC every year. The proponent should carry out a comprehensive replenishment study considering data collected at same location and at same time for at least three years and same needs to be submitted to Regional Office, MoEF&CC after every three years;

4a) To fulfill to objective of the replenishment study and to comply with the terms of Environmental Clearance (EC) letter conditions the Project Proponent constituted "Monitoring Committee" of following experts for this purpose :

i)	S.N. Sharma	:	Mining Expert
ii)	Yogeshwar P Mishra	:	Environmental Expertcum Drone Survey expert
iii)	Arafat Khan	:	GIS cum Survey Expert
iv)	Sudhir Kumar	:	MIS/GIS Engineer
v)	S.C. Prasad	:	Mine Manager

5. Software & Equipment Deployed

Equipment:

- GPS
- Drone

Software:

- Drone Mapper (Software)
- DJI Mavic GPS &Glonass Based Software
- Arc Gis 10.8 (Software)
- AutoCAD 2011 (Software)

In addition to above, Project Proponent (M/S MP Traders) appointed M/S JBB Technocrat Private Limited, Faridabad (Haryana), an Environmental Consulting Company for undertaking

a) Pre-monsoon survey and replenishment study
b) Post-monsoon survey and replenishment study
c) To prepare composite sections of pre and post monsoon survey findings
d) To calculate the volume of sand replenished during study period.
e) Finally to prepare "Replenishment Study Report" and to submit it to the Regional Office, MoEF&CC.

6. Replenishment Study

6.1 General Introduction:

Sediment is a naturally occurring material that is broken down by processes of weathering and erosion, and is subsequently transported by the action of wind, water, or ice or by the force of gravity acting on the particles

Sand is an essential minor mineral used extensively across the country as a useful construction constituent and variety of other uses in sports, agriculture, glass making (a form of sand with

high silica content) etc. It is common knowledge that minerals are Non-renewable but this form of mineral naturally gets replenished from time to time in a given river system and is very much interrelated to the hydrological cycle in a river basin. But its over-exploitation and indiscriminate mining supersedes replenishment &optimum extraction is overtaken by profits, extraction has exceeded its replenishment rate and it neglects laws of mineral conservation.

Sand mining has become a widely spread activity and does not require a huge set up or technology, the number of ventures has increased extensively and it has become a footloose industry in itself but the backward-forward linkages are becoming stronger as many are getting employed as well as the construction activity / industry requires this mineral at consistent rates. In the state of Punjab, sand has been declared as an essential commodityso as to control its extraction and sale price. Andhra Pradesh on the other hand is heading towards a lottery system1. Riverine environmental systems are unique in them and provide environmental services, natural resources to meet variety of needs of urban and rural communities. The Rivers originating from the Himalayas bring with them lots of aggregate materials whereas as they move downstream, only finer elements / minerals like sand are found in abundance. Rivers also act as natural administrative boundariesamong the states and this gives rise to improper and unclear demarcation of boundaries as the river keeps changing its course from time to time thereby unclear administrative controls and mechanisms becomes a point of excuse for administration for any illegal activity taking in this disputed area. River Yamuna near Dakpathar barrage leaves Uttarakhand and enters Himachal Pradesh.

The YAMUNA RIVER is the biggest tributary of the river Ganga in North India. Its source in the Yamunotry glacier at an elevation of 6387 mtrs on South western sides of Banderpooch crests in the lower Himalayan ranges. The overall span of the Yamuna river is 1376 Kms (855 miles) with catchment area of 366223 square km (141,399 square km). This encompasses 40.2 % of the whole Ganga valley, prior to joining Ganga at TriveniSangam in Allahabad (UP)

Itinerary of Yamuna River:

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

Itinerary of Drainage area of Yamuna:

The origin of Yamuna is situated in the Yamunotri glacier at an elevation of 6387 mtrs on SE sides of Banderpooch crests, which are located in the Mussoorie range of lower Himalayan range in Uttrakashi district of Uttrakhand, to the North of Haridwar. From this place Yamuna runs to South around 200 Kms across the Shivalik mountain ranges and lower Himalayan ranges.

A significant portion of its beginning of Drainage basin (with total area of 2320 square km) is situated in HP and a major tributary sapping the upper drainage basin in the Tons, which is also biggest and most extensive tributary of the Yamuna. Other tributaries in the area are the Rishi Ganga, Giri, Hanuman Ganga, Kunta& Bata, which sap the upper drainage basin of the huge Yamuna river. Subsequently, the river moves down the terrains of Doon basin at DakPatharclose to Dehradun, in this place water is redirected into a channel for the purpose of electricity generation. Once it goes across the sikh religious place of Ponta Sahib, the river arrives at Tajewala in the YAMUNANAGAR district of Haryana where a dam was constructed in 1873. This dam is the origin of the two major channels or water courses – Eastern Yamuna Canal and Western Yamuna Canal and both drain in UP & Haryana.

The Western Yamuna Canal (WYC) traverses Karnal, Yamunanagar and Panipat prior to arriving at the Haiderpur water treatment plant, which provides a portion of municipal water provisions of Delhi. The Yamuna also forms natural boundary between the states of Uttrakhand& HP and also amid the states of UP and Haryana.

Together with the Ganga to which it flows almost parallel once it meets the Indo-Gangetic plateau, the biggest Alluvial productive area in the World, it forms the Ganges-Yamuna Doab are stretched across 69,000 square Km which is 33% of the whole area.

Drainage system is the pattern formed by streams, rivers and lakes in a drainagebasin. In a drainage system, streams or rivers always connect together to formnetworks. Many factors such as topography, soil type, bedrock type, climate &vegetation cover influence input, output and transport of sediment and water in adrainage basin (Charlton, 2008). These factors also influence the nature of thepattern of water bodies (Twidale, 2004). As a consequence, drainage pattern canreflect geographical characteristics of a river network to a certain extent. There areseveral types of drainage pattern. So far, much research has been done on thedescription of drainage patterns in geology and hydrology (e.g. Howard, 1967;Lambert, 1998; Twidale, 2004; Pidwirny, 2006).

In addition, sediment transport knowledge is important in river restoration,ecosystem protection, navigation, watershed studies and reservoir management.Bed load represents the lower portion of sediment load in natural rivers. Fluvialsediment load materials are transported by rivers. Sediment load can be dividedinto bed load and suspended load based on the mode of transport. Bed load istransported close to the bed where particles moved by rolling, sliding, or dissolving(Adegbola, 2012). Xlaoqing (2003) explained that bed load transport in naturalrivers is a complicated event. Its movement is quite uneven in both the transverse & longitudinal directions, which vary considerably.

6.2 Physiography:

The area forms a part of the Indo-Gangetic plains and exhibit flat terrain withgeneral slope from north to south. The area is devoid of any prominent topographic features. However, a natural depression exists in north & northwest of Gohana(29˚08′22″N & 76˚42′55″E). The maximum elevation of the plain is 230m above mRL. Topographically the district can be divided into the following units.

Active flood plains along the present day course of the river Yamuna in eastern part of the district. These are generally bordering the active flood plains and are wider, low lying flat tracts.

6.3 Drainage:

The Yamuna which marks the eastern boundary of the Haryana State as well asSonipat district provides the major drainage in the area. The River Yamunaemerges from Yamnotri off the Bansur-Punch glacier in TehriGarhwal district ofUttarakhand at an elevation of 6330 meters. It emerges into the plains from thefoothills at Kalesar just north of Tajewala.The area constitutes alluvial plain without any conspicuous topographical features and forms a part of the vast Indo-Gangetic plain. The general slope of the area is southwards.

The Yamuna Rivers are plays an important role for the nation and provide waterrequired by various sectors such as irrigation, drinking, recreation and industrial requirements etc. Besides, mining activities are also being carried out in the rivers for the developmental process.Di-siltation (remove of excess sand and stone from river bed) of the river helps tomaintain the carrying capacity and provides protection from flooding duringmonsoon season. Further, continuous flow of river is essential for ecological andeconomic needs such as irrigation and biodiversity etc. Drainage study of the river helps to understand potential carrying capacity of water during pre-monsoon& post monsoon season which is generated from rainfall in the watershed and quantity of di-siltation of rivers under mining affected areas. Drainage and

replenishment study was carried out in Yamuna River, Haryana was found with ephemeral streams. Quantification and estimation of river bed material (RBM) was accomplished by followed three scientific approaches i. e. mapping of watersheds by using Arc GIS software & and ERDAS software using analysis, survey of proposed mining area and grain size distribution of sand and gravel.

6.4 Sedimentation. Assessment and Infrastructure

Dandy& Bolton formula is often used to check whether the sedimentation yield exceedsthe replenishment rate but the whole question is whether there is adequate monitoringof the river basin, the answer is no as hydrological stations are sparsely spread. Theformula uses catchment area and mean annual runoff as key determinants to give ayield value. It does not differentiate in basin wide smaller streams and theircharacteristics. CWC distinguishes river basins as classified and non-classified, as perthe latest hydrological data for unclassified River basins; there are 122 GDSW (Gauge,Discharge, Sediment & Water Quality) sites in 12 such basins, the number was 147 in2005. This brings in context the whole issue of scientific mining, thereby indicating thatthe monitoring of sediment yield in rivers / streams within the river basins is essential toarrive at extraction rates and express and conduct environmental studies based on

these basin wide characteristics which should become part of the 'Terms of Reference'.**sedimentation,** in the geological sciences, process of deposition of a solid material from a state of suspension or solution in a fluid (usually air or water). Broadly defined it also includes deposits from glacial ice and those materials collected under the impetus of gravity alone, as in talus deposits, or accumulations of rock debris at the base of cliffs. The term is commonly used as a synonym for sedimentary petrology and sedimentology.

The physics of the most common sedimentation process, the settling of solid particles from fluids, has long been known. The settling velocity equation formulated in 1851 by G.G. Stokes is the classic starting point for any discussion of the sedimentation process. Stokes showed that the terminal settling velocity of spheres in a fluid was inversely proportional to the fluid's viscosity and directly proportional to the density difference of fluid and solid, the radius of the spheres involved, and the force of gravity. Stokes' equation is valid, however, only for very small spheres (under 0.04 millimetre [0.0015 inch] in diameter) and hence various modifications of Stokes' law have been proposed for nonspherical particles and particles of larger size.

No settling velocity equation, however valid, provides a sufficient explanation of even the basic physical properties of natural sediments. The grain size of the clastic elements and their sorting, shape, roundness, fabric, and packing are the results of complex processes related not only to the density and viscosity of the fluid medium but also to the translational velocity of the depositing fluid, the turbulence resulting from this motion, and the roughness of the beds over which it moves. These processes also are related to various mechanical properties of the solid materials propelled, to the duration of sediment transport, and to other little-understood factors.

Sedimentation is generally considered by geologists in terms of the textures, structures, and fossil content of the deposits laid down in different geographic and geomorphic environments. Great efforts have been made to differentiate between continental, near-shore, marine, and other deposits in the geologic record. The classification of environments and criteria for their recognition is still a subject of lively debate. The analysis and interpretation of ancient deposits has been advanced by the study of modern sedimentation. Oceanographic and limnologic expeditions have shed much light on sedimentation in the Gulf of Mexico, the Black Sea, and the Baltic Sea, and in various estuaries, lakes, and fluvial basins in all parts of the world.

Chemical sedimentation is understood in terms of chemical principles and laws. Although the famous physical chemist J.H. van't Hoff applied the principles of phase equilibria to the problem of crystallizing brines and the origin of salt deposits as early as 1905, little effort was made to apply physical chemistry to the problems of chemical sedimentation. More recently, however, there has been investigation of the role of the redox (mutual reduction and oxidation) potential and pH (acidity–alkalinity) in the precipitation of many chemical sediments, and a renewed effort has been made to apply known thermodynamic principles to the origin of anhydrite and gypsum deposits, to the chemistry of dolomite formation, and to the problem of the ironstones and related sediments.

The factors which affects the "Computation of Sediment" :-

a) Geomorphology & Drainage Pattern : The following geomorphic units plays important role :
    - Structural Plain
    - Structural Hill
    - Structural Ridge

- Denudation Ridge & Valley
- Plain & Plateau of Gangetic plain
- Highly Dissected pediment
- Un dissected pediment

b) Distribution of Basin Area River wise (Area in Sq. Km or Sq. Miles)

c) Drainage System/Pattern of the area (Drainage Density = …….Km/Sq. Km of Yamuna River

d) Rainfall & Climate : Year wise Rainfall data for previous 10 years of Yamuna Basin/River

e) As per Dandy & Bolton study "Sediment Yield" can be related to i) Catchment Area and ii) Mean Annual Run-off

f)

7. Approach & Methodology Followed for Replenishment Study of Nagli Block B-YNR-15 (Minor Mineral Sand Mine):-

a) Pre-monsoon survey of River bed with the help of GPS and Drone

b) Grid pattern 30 m x 20 m (30 m along the length of the river and 20 m along width of the river) or part thereof.

c) To draw pre-monsoon contour map (Base map considered as per approved mining plan)

d) Post-monsoon survey of River bed with the help of GPS and Drone

e) Same Grid pattern (30 m x 20 m) or part thereof was considered for survey.

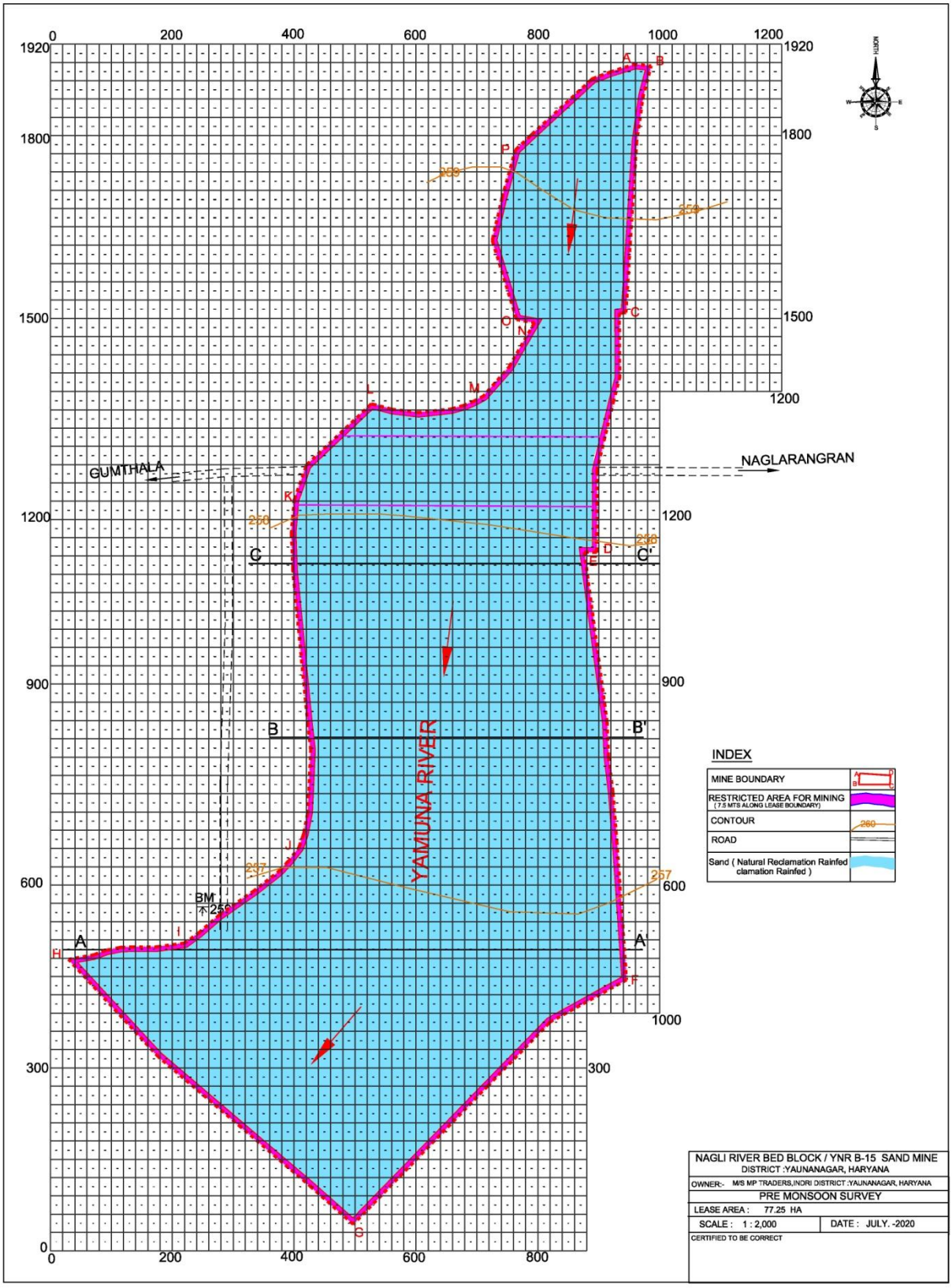
f) To draw post-monsoon contour map (Base map considered as per approved mining plan)

g) To draw composite sections of Pre and post monsoon maps. This will determine the depth and volume of sand replenished.

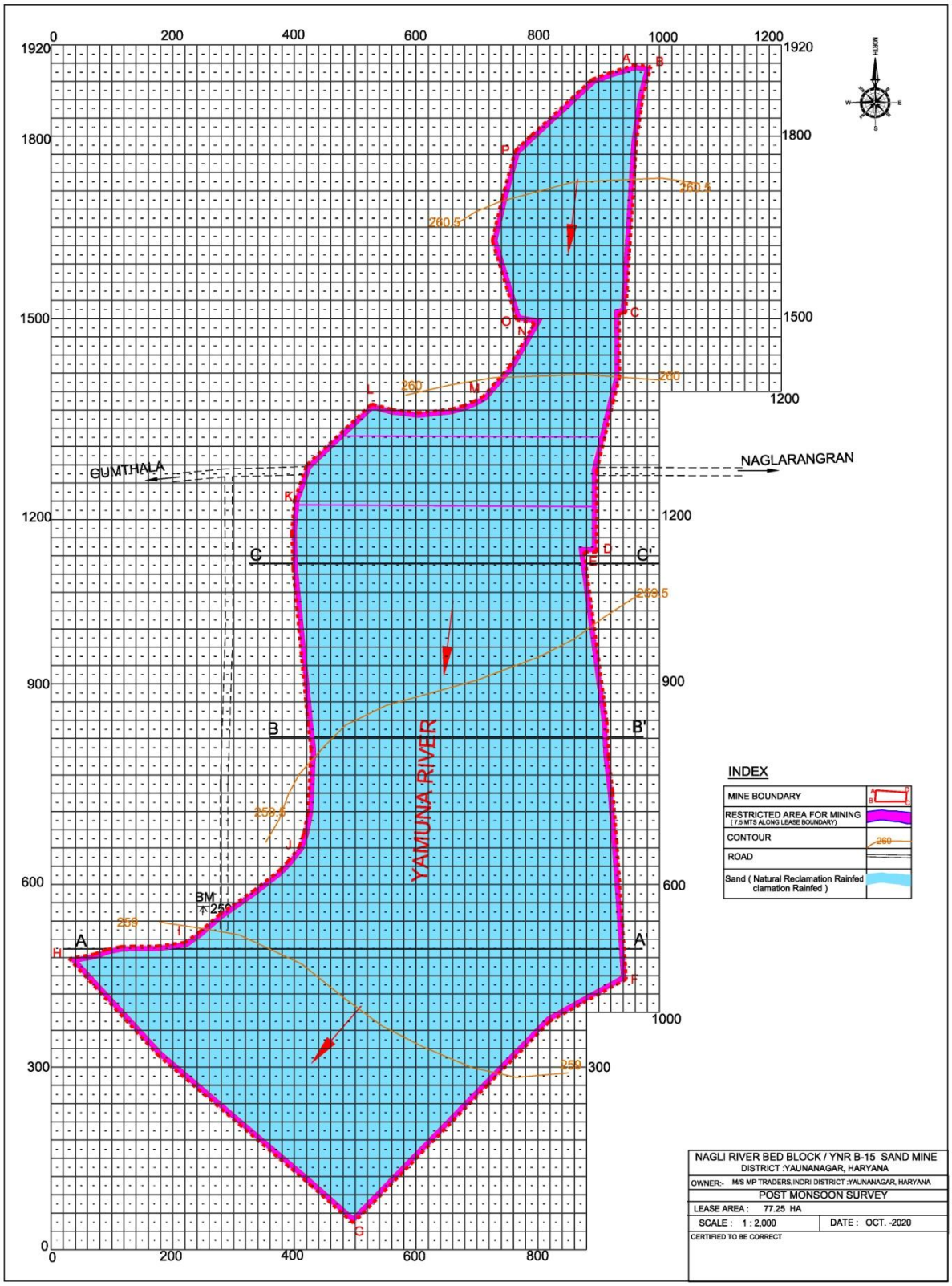
h) Finally to calculate the volume of sand with grid pattern of 30 m x 20 m multiplied by depth of replenishment.

i) The tonnage of replenishment will be volume of sand multiplied by density of sand (which is 2 T per Cubic m)

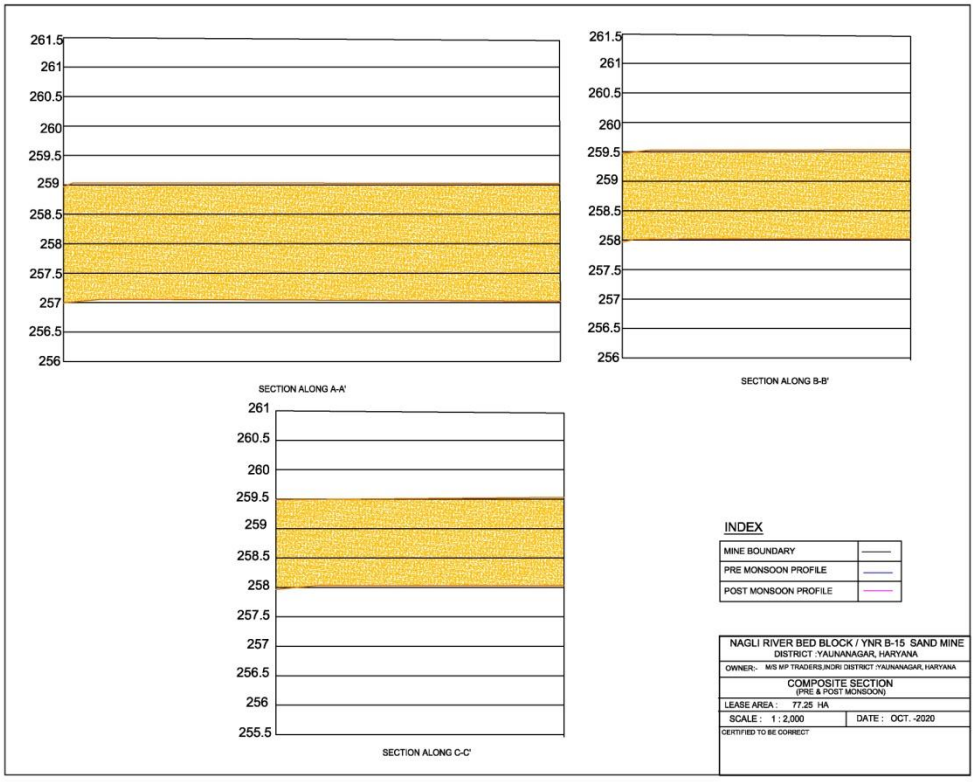
a) Pre-monsoon Contour Map (Grid Pattern : 30m x 20m or Part Thereof))



b) Post-monsoon Contour Map (Grid Pattern : 30m x 20m or Part Thereof)



c) Composite section of Pre and Post Monsoon Contour Map



a) Tonnage calculation of Sand Replenished.

Grid	Grid Area	Pre Monsoon Elevation	Post Monsoon Elevation	Difference of Elevation (Pre And Post Monsoon) in m	Tonnage
69	20	257	259	2	80
112	200	257	259	2	800
113	580	257	259	2	2320
114	450	257	259	2	1800
115	50	257	259	2	200
154	50	257	259	2	200
155	580	257	259	2	2320
156	600	257	259	2	2400
157	600	257	259	2	2400
158	600	257	259	2	2400
159	580	257	259	2	2320
160	250	257	259	2	1000
196	20	257	259	2	80
197	400	257	259	2	1600
198	600	257	259	2	2400
199	600	257	259	2	2400
200	600	257	259	2	2400
201	600	257	259	2	2400
202	600	257	259	2	2400
203	600	257	259	2	2400
204	600	257	259	2	2400
205	350	257	259	2	1400
206	50	257	259	2	200
238	20	257	259	2	80
239	300	257	259	2	1200
240	580	257	259	2	2320
241	600	257	259	2	2400
242	600	257	259	2	2400
243	600	257	259	2	2400
244	600	257	259	2	2400
245	600	257	259	2	2400
246	600	257	259	2	2400
247	600	257	259	2	2400
248	600	257	259	2	2400
249	600	257	259	2	2400
250	550	257	259	2	2200
251	200	257	259	2	800
281	200	257	259	2	800

3159	600	259	260.5	1.5	1800
3160	580	259	260.5	1.5	1740
3214	20	259	260.5	1.5	60
3215	300	259	260.5	1.5	900
3216	580	259	260.5	1.5	1740
3217	600	259	260.5	1.5	1800
3218	600	259	260.5	1.5	1800
3219	600	259	260.5	1.5	1800
3220	600	259	260.5	1.5	1800
3221	50	259	260.5	1.5	150
3276	50	259	260.5	1.5	150
3277	500	259	260.5	1.5	1500
3278	600	259	260.5	1.5	1800
3279	600	259	260.5	1.5	1800
3280	600	259	260.5	1.5	1800
3281	200	259	260.5	1.5	600
3338	100	259	260.5	1.5	300
3339	200	259	260.5	1.5	600
3340	300	259	260.5	1.5	900
3341	300	259	260.5	1.5	900
					2408090

Conclusion

Replenishment Study for the year 2020 reveals that there is replenishment (Natural Reclamation Rainfed Water Containing Sand) of approximately 24, 08,090 MT of sand.

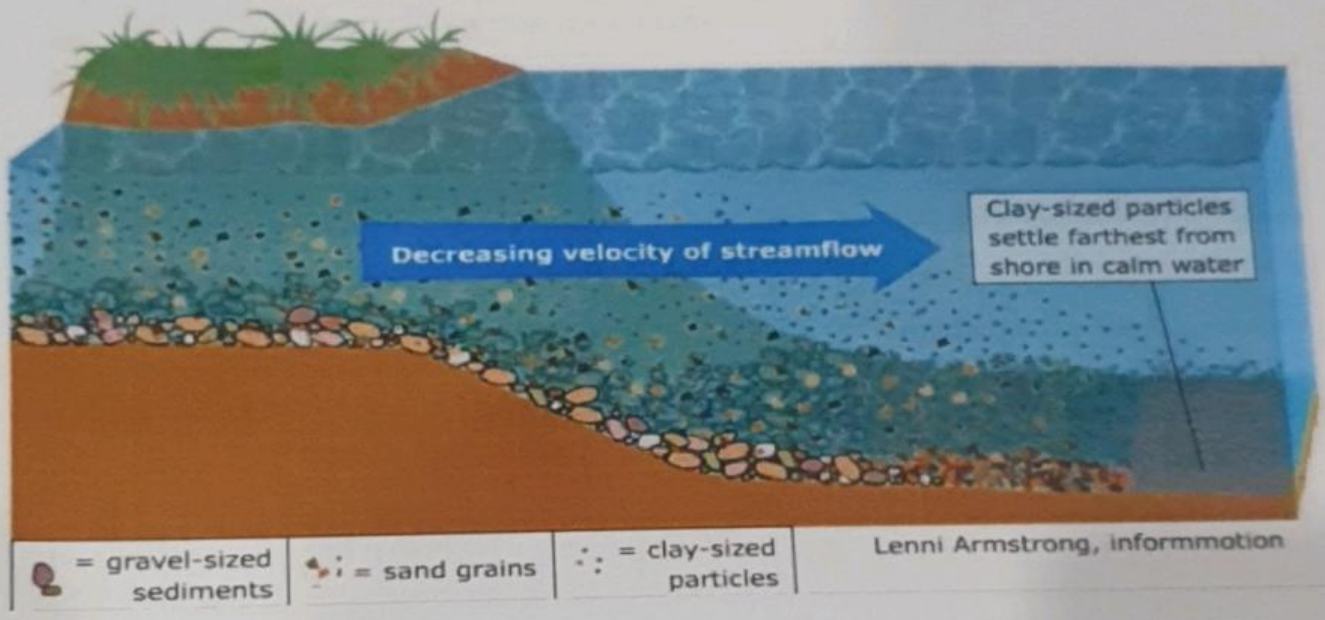
d) Site Photographs

REPLENISHMENT STUDY REPORT FOR SAND MINE (MINOR MINERAL)

NAGLI BLOCK- (YNR B-15)

{Lease Area: 77.25 Ha, Production Capacity: 22.40 Lac T/Annum}

PERIOD: 2021 (Pre-Monsoon: June-2021 & Post-Monsoon-Oct-2021



PREPARED BY: JBB TECHNOCRAT PVT LTD, NCR REGION, FARIDABAD, HARYANA November-2020
{CIN No. 06AVPAS5608RIZZ}
(Waste Management, Environment and Mining Solutions Consulting)
ISO: 9001:2015 Certified
www.jbbtechnocrat.com (30th DECEMBER, 2021)

SUBMITTED TO:

REGIONAL OFFICER,
HARYANA STATE POLLUTION CONTROL BOARD, YAMUNANAGAR (HARYANA)

SUBMITTED BY:

M/S M.P.TRADERS
Near Nirankari Colony, Indri
District : Yamunanagar (Haryana)

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SUBJECT: REPORT ON REPLENISHMENT STUDY FOR RIVER BED MINING PROJECT OF MINOR MINERAL SAND OF NAGLI BLOCK-B-YNR-15, YAMUNANAGR (HARYANA) OF M/S MP TRADERS FOR THE PERIOD OF 2021

References:

a) Environmental Clearance vide letter no. F.No. J-11015/214/2016-IA.II(M) dated 09th April, 2018

1) The Project :

M/s M.P. Traders, (Shri VedpalMandhan), Near Nirankari Colony, Indri, District:Yamunanagar (Haryana) owns mining lease hold area of Sand (Minor Mineral) of 77.25 hectares with proposed production capacity of 22.4 Lakh TPA (ROM). The mine lease area is located at Nagli Block, Yamuna Nagar B-15, Tehsil Radaur, District :Yamuna Nagar, State : Haryana.The mine lease area lies on river bed of Yamuna River.

The co-ordinates of Mine Lease area are- latitude and longitude: Pillar No. A-N 29° 58' 29" E 77° 13' 47" Pillar No. B -N 29° 58' 30" E 77° 13' 50.5" Pillar No. C- N 29° 58' 16" E 77° 13' 48.5" Pillar No. D- N 29° 58' 02" E 77° 13' 46" Pillar No. E- N 29° 58' 02" E 77° 13' 45" Pillar No. F- N 29° 57' 38" E 77° 13' 45" Pillar No. G- N 29° 57' 24" E 77° 13' 37" Pillar No. H- N 29° 57' 38" E 77° 13' 13" Pillar No. I- N 29° 57' 40" E 77° 13' 20.5" Pillar No. J- N 29° 57' 46" E 77° 13' 27" Pillar No. K- N 29° 58' 06" E 77° 13' 28" Pillar No. L- N 29° 58' 10" E 77° 13' 32" Pillar No. M- N 29° 58' 10" E 77° 13' 39" Pillar No. N- N 29° 58' 15" E 77° 13' 43" Pillar No. O- N 29° 58' 15" E 77° 13' 42" Pillar No. P- N 29° 58' 25" E 77° 13' 42"

2) Objective for Replenishment Study

The requirements of the "Replenishment Study" as per the terms of EC letter are as below :Sr. No, 8 of EC :The proponent submitted that before starting the mining operation, initial level(baseline data) of the mining site will be taken, for this purpose section will be cut at30 meter interval along the length of the river and at each section line levels will betaken at an interval of 5-20 meters depending on the width of the river. Theproponent submitted that the baseline data so collected will be submitted to theMinistry within one month of the grant of EC. The proponent submitted that forannual replenishment study reputed institute/Government agency will be engaged.Additional Conditions of EC (A-vi) :The Project Proponent shall appoint a Monitoring Committee to monitor the

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replenishmentstudy, traffic management, levels of production,river Bank erosion and maintenance of Road etc. The proponent should carry out replenishment study annually to ascertain the quantity of material replenished and production should not be more than the quantity replenished. In case the material replenished is more than the quantity mentioned in this Environmental Clearance then quantity that can be excavated is limited to 22.4 Lakh TPA (ROM). The proponent will submit the replenishment study report to Regional Office, MoEF&CC every year. The proponent should carry out a comprehensive replenishment study considering data collected at same location and at same time for at least three years and same needs to be submitted to Regional Office, MoEF&CC after every three years;

3) **Period of Replenishment Study (2020)**

a) The Pre-monsoon Period: 12 to 14th June- 2021

b) The Post-Monsoon Period : 20 to 23rdOctober-2021

4) **Need for present Annual Replenishment Study**

- As per Additional Conditions of EC (A-vi) , the Project Proponent should carry out replenishment study annually to ascertain the quantity of material replenished.

- The proponent will submit the replenishment study report to Regional Office, MoEF&CC every year. The proponent should carry out a comprehensive replenishment study considering data collected at same location and at same time for at least three years and same needs to be submitted to Regional Office, MoEF&CC after every three years;

4a) To fulfill to objective of the replenishment study and to comply with the terms of Environmental Clearance (EC) letter conditions the Project Proponent constituted "Monitoring Committee" of following experts for this purpose :

i)	S.N. Sharma	:	Mining Expert
ii)	Yogeshwar P Mishra	:	Environmental Expertcum Drone Survey expert
iii)	Arafat Khan	:	GIS cum Survey Expert
iv)	Sudhir Kumar	:	MIS/GIS Engineer
v)	S.C. Prasad	:	Mine Manager

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5. Software & Equipment Deployed

Equipment:

- GPS
- Drone

Software:

- Drone Mapper (Software)
- DJI Mavic GPS &Glonass Based Software
- Arc Gis 10.8 (Software)
- AutoCAD 2011 (Software)

In addition to above, Project Proponent (M/S MP Traders) appointed M/S JBB Technocrat Private Limited, Faridabad (Haryana), an Environmental Consulting Company for undertaking

a) Pre-monsoon survey and replenishment study
b) Post-monsoon survey and replenishment study
c) To prepare composite sections of pre and post monsoon survey findings
d) To calculate the volume of sand replenished during study period.
e) Finally to prepare "Replenishment Study Report" and to submit it to the Regional Office, MoEF&CC.

6. Replenishment Study

6.1 General Introduction:

Sediment is a naturally occurring material that is broken down by processes of weathering and erosion, and is subsequently transported by the action of wind, water, or ice or by the force of gravity acting on the particles

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

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indiscriminate mining supersedes replenishment &optimum extraction is overtaken by profits, extraction has exceeded its replenishment rate and it neglects laws of mineral conservation.

Sand mining has become a widely spread activity and does not require a huge set up or technology, the number of ventures has increased extensively and it has become a footloose industry in itself but the backward-forward linkages are becoming stronger as many are getting employed as well as the construction activity / industry requires this mineral at consistent rates. In the state of Punjab, sand has been declared as an essential commodityso as to control its extraction and sale price. Andhra Pradesh on the other hand is heading towards a lottery system1. Riverine environmental systems are unique in them and provide environmental services, natural resources to meet variety of needs of urban and rural communities. The Rivers originating from the Himalayas bring with them lots of aggregate materials whereas as they move downstream, only finer elements / minerals like sand are found in abundance. Rivers also act as natural administrative boundariesamong the states and this gives rise to improper and unclear demarcation of boundaries as the river keeps changing its course from time to time thereby unclear administrative controls and mechanisms becomes a point of excuse for administration for any illegal activity taking in this disputed area. River Yamuna near Dakpathar barrage leaves Uttarakhand and enters Himachal Pradesh.

The YAMUNA RIVER is the biggest tributary of the river Ganga in North India. Its source in the Yamunotry glacier at an elevation of 6387 mtrs on South western sides of Banderpooch crests in the lower Himalayan ranges. The overall span of the Yamuna river is 1376 Kms (855 miles) with catchment area of 366223 square km (141,399 square km). This encompasses 40.2 % of the whole Ganga valley, prior to joining Ganga at TriveniSangam in Allahabad (UP)

Itinerary of Yamuna River:

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

Itinerary of Drainage area of Yamuna:

The origin of Yamuna is situated in the Yamunotri glacier at an elevation of 6387 mtrs on SE sides of Banderpooch crests, which are located in the Mussoorie range of lower Himalayan range in Uttrakashi district of Uttrakhand, to the North of Haridwar. From this place Yamuna

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runs to South around 200 Kms across the Shivalik mountain ranges and lower Himalayan ranges.

A significant portion of its beginning of Drainage basin (with total area of 2320 square km) is situated in HP and a major tributary sapping the upper drainage basin in the Tons, which is also biggest and most extensive tributary of the Yamuna. Other tributaries in the area are the Rishi Ganga, Giri, Hanuman Ganga, Kunta& Bata, which sap the upper drainage basin of the huge Yamuna river. Subsequently, the river moves down the terrains of Doon basin at DakPatharclose to Dehradun, in this place water is redirected into a channel for the purpose of electricity generation. Once it goes across the sikh religious place of Ponta Sahib, the river arrives at Tajewala in the YAMUNANAGAR district of Haryana where a dam was constructed in 1873. This dam is the origin of the two major channels or water courses – Eastern Yamuna Canal and Western Yamuna Canal and both drain in UP & Haryana.

The Western Yamuna Canal (WYC) traverses Karnal, Yamunanagar and Panipat prior to arriving at the Haiderpur water treatment plant, which provides a portion of municipal water provisions of Delhi. The Yamuna also forms natural boundary between the states of Uttrakhand& HP and also amid the states of UP and Haryana.

Together with the Ganga to which it flows almost parallel once it meets the Indo-Gangetic plateau, the biggest Alluvial productive area in the World, it forms the Ganges-Yamuna Doab are stretched across 69,000 square Km which is 33% of the whole area.

Drainage system is the pattern formed by streams, rivers and lakes in a drainagebasin. In a drainage system, streams or rivers always connect together to formnetworks. Many factors such as topography, soil type, bedrock type, climate &vegetation cover influence input, output and transport of sediment and water in adrainage basin (Charlton, 2008). These factors also influence the nature of thepattern of water bodies (Twidale, 2004). As a consequence, drainage pattern canreflect geographical characteristics of a river network to a certain extent. There areseveral types of drainage pattern. So far, much research has been done on thedescription of drainage patterns in geology and hydrology (e.g. Howard, 1967;Lambert, 1998; Twidale, 2004; Pidwirny, 2006).

In addition, sediment transport knowledge is important in river restoration,ecosystem protection, navigation, watershed studies and reservoir management.Bed load represents the lower portion of sediment load in natural rivers. Fluvialsediment load materials are transported by rivers. Sediment load can be dividedinto bed load and suspended load based on the mode of

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transport. Bed load istransported close to the bed where particles moved by rolling, sliding, or dissolving(Adegbola, 2012). Xlaoqing (2003) explained that bed load transport in naturalrivers is a complicated event. Its movement is quite uneven in both the transverse & longitudinal directions, which vary considerably.

6.2 Physiography:

The area forms a part of the Indo-Gangetic plains and exhibit flat terrain withgeneral slope from north to south. The area is devoid of any prominent topographic features. However, a natural depression exists in north & northwest of Gohana(29°08′22″N & 76°42′55″E). The maximum elevation of the plain is 230m above mRL. Topographically the district can be divided into the following units.

Active flood plains along the present day course of the river Yamuna in eastern part of the district. These are generally bordering the active flood plains and are wider, low lying flat tracts.

6.3 Drainage:

The Yamuna which marks the eastern boundary of the Haryana State as well asSonipat district provides the major drainage in the area. The River Yamunaemerges from Yamnotri off the Bansur-Punch glacier in TehriGarhwal district ofUttarakhand at an elevation of 6330 meters. It emerges into the plains from thefoothills at Kalesar just north of Tajewala.The area constitutes alluvial plain without any conspicuous topographical features and forms a part of the vast Indo-Gangetic plain. The general slope of the area is southwards.

The Yamuna Rivers are plays an important role for the nation and provide waterrequired by various sectors such as irrigation, drinking, recreation and industrial requirements etc. Besides, mining activities are also being carried out in the rivers for the developmental process.Di-siltation (remove of excess sand and stone from river bed) of the river helps tomaintain the carrying capacity and provides protection from flooding duringmonsoon season. Further, continuous flow of river is essential for ecological andeconomic needs such as irrigation and biodiversity etc. Drainage study of the river helps to understand potential carrying capacity of water during pre-monsoon& post monsoon season which is generated from rainfall in the watershed and quantity of di-siltation of rivers under mining affected areas. Drainage and replenishment study was carried out in Yamuna River, Haryana was found with ephemeral streams. Quantification and estimation of river bed material (RBM) was accomplished by followed three scientific approaches i. e. mapping of watersheds by using Arc GIS software

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&and ERDAS software using analysis, survey of proposed mining area and grain size distribution of sand and gravel.

6.4 Sedimentation. Assessment and Infrastructure

Dandy& Bolton formula is often used to check whether the sedimentation yield exceedsthe replenishment rate but the whole question is whether there is adequate monitoringof the river basin, the answer is no as hydrological stations are sparsely spread. Theformula uses catchment area and mean annual runoff as key determinants to give ayield value. It does not differentiate in basin wide smaller streams and theircharacteristics. CWC distinguishes river basins as classified and non-classified, as perthe latest hydrological data for unclassified River basins; there are 122 GDSW (Gauge,Discharge, Sediment & Water Quality) sites in 12 such basins, the number was 147 in2005. This brings in context the whole issue of scientific mining, thereby indicating thatthe monitoring of sediment yield in rivers / streams within the river basins is essential toarrive at extraction rates and express and conduct environmental studies based on these basin wide characteristics which should become part of the 'Terms of Reference'.**sedimentation,** in the geological sciences, process of deposition of a solid material from a state of suspension or solution in a fluid (usually air or water). Broadly defined it also includes deposits from glacial ice and those materials collected under the impetus of gravity alone, as in talus deposits, or accumulations of rock debris at the base of cliffs. The term is commonly used as a synonym for sedimentary petrology and sedimentology.

The physics of the most common sedimentation process, the settling of solid particles from fluids, has long been known. The settling velocity equation formulated in 1851 by G.G. Stokes is the classic starting point for any discussion of the sedimentation process. Stokes showed that the terminal settling velocity of spheres in a fluid was inversely proportional to the fluid's viscosity and directly proportional to the density difference of fluid and solid, the radius of the spheres involved, and the force of gravity. Stokes' equation is valid, however, only for very small spheres (under 0.04 millimetre [0.0015 inch] in diameter) and hence various modifications of Stokes' law have been proposed for nonspherical particles and particles of larger size.

No settling velocity equation, however valid, provides a sufficient explanation of even the basic physical properties of natural sediments. The grain size of the clastic elements and their sorting, shape, roundness, fabric, and packing are the results of complex processes related not only to the density and viscosity of the fluid medium but also to the translational velocity of the

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depositing fluid, the turbulence resulting from this motion, and the roughness of the beds over which it moves. These processes also are related to various mechanical properties of the solid materials propelled, to the duration of sediment transport, and to other little-understood factors.

Sedimentation is generally considered by geologists in terms of the textures, structures, and fossil content of the deposits laid down in different geographic and geomorphic environments. Great efforts have been made to differentiate between continental, near-shore, marine, and other deposits in the geologic record. The classification of environments and criteria for their recognition is still a subject of lively debate. The analysis and interpretation of ancient deposits has been advanced by the study of modern sedimentation. Oceanographic and limnologic expeditions have shed much light on sedimentation in the Gulf of Mexico, the Black Sea, and the Baltic Sea, and in various estuaries, lakes, and fluvial basins in all parts of the world.

Chemical sedimentation is understood in terms of chemical principles and laws. Although the famous physical chemist J.H. van't Hoff applied the principles of phase equilibria to the problem of crystallizing brines and the origin of salt deposits as early as 1905, little effort was made to apply physical chemistry to the problems of chemical sedimentation. More recently, however, there has been investigation of the role of the redox (mutual reduction and oxidation) potential and pH (acidity–alkalinity) in the precipitation of many chemical sediments, and a renewed effort has been made to apply known thermodynamic principles to the origin of anhydrite and gypsum deposits, to the chemistry of dolomite formation, and to the problem of the ironstones and related sediments.

The factors which affects the "Computation of Sediment" :-

a) Geomorphology & Drainage Pattern : The following geomorphic units plays important role :
   - Structural Plain
   - Structural Hill
   - Structural Ridge
   - Denudation Ridge & Valley
   - Plain & Plateau of Gangetic plain
   - Highly Dissected pediment
   - Un dissected pediment

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b) Distribution of Basin Area River wise (Area in Sq. Km or Sq. Miles)

c) Drainage System/Pattern of the area (Drainage Density = ...Km/Sq. Km of Yamuna River

d) Rainfall & Climate : Year wise Rainfall data for previous 10 years of Yamuna Basin/River

e) As per Dandy & Bolton study "Sediment Yield" can be related to i) Catchment Area and ii) Mean Annual Run-off

f)

7. Approach & Methodology Followed for Replenishment Study of Nagli Block B-YNR-15 (Minor Mineral Sand Mine):-

a) Pre-monsoon survey of River bed with the help of GPS and Drone

b) Grid pattern 30 m x 20 m (30 m along the length of the river and 20 m along width of the river) or part thereof.

c) To draw pre-monsoon contour map (Base map considered as per approved mining plan)

d) Post-monsoon survey of River bed with the help of GPS and Drone

e) Same Grid pattern (30 m x 20 m) or part thereof was considered for survey.

f) To draw post-monsoon contour map (Base map considered as per approved mining plan)

g) To draw composite sections of Pre and post monsoon maps. This will determine the depth and volume of sand replenished.

h) Finally to calculate the volume of sand with grid pattern of 30 m x 20 m multiplied by depth of replenishment.

i) The tonnage of replenishment will be volume of sand multiplied by density of sand (which is 2 T per Cubic m)

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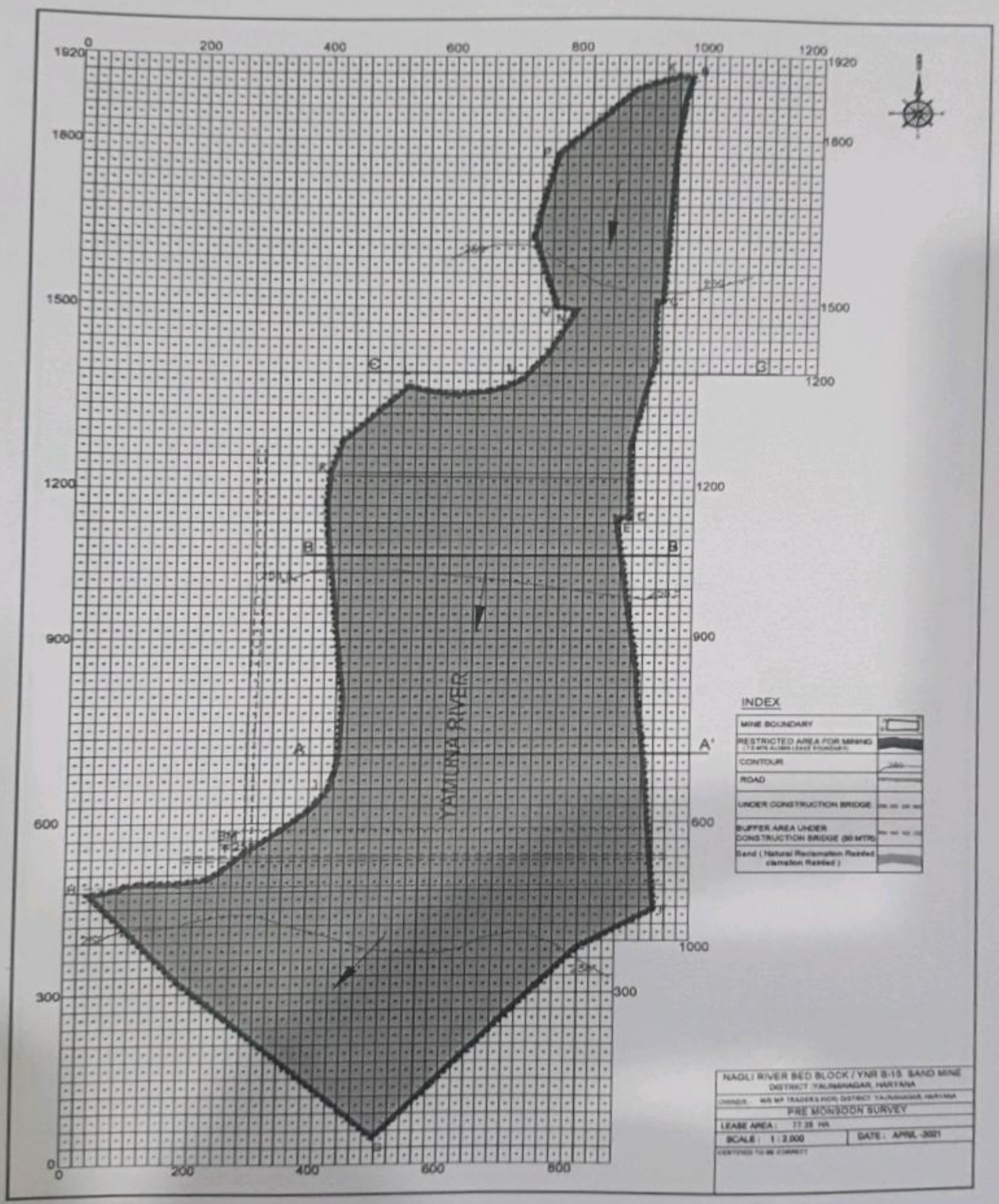
a) Pre-monsoon Contour Map (Grid Pattern : 30m x 20m or Part Thereof))



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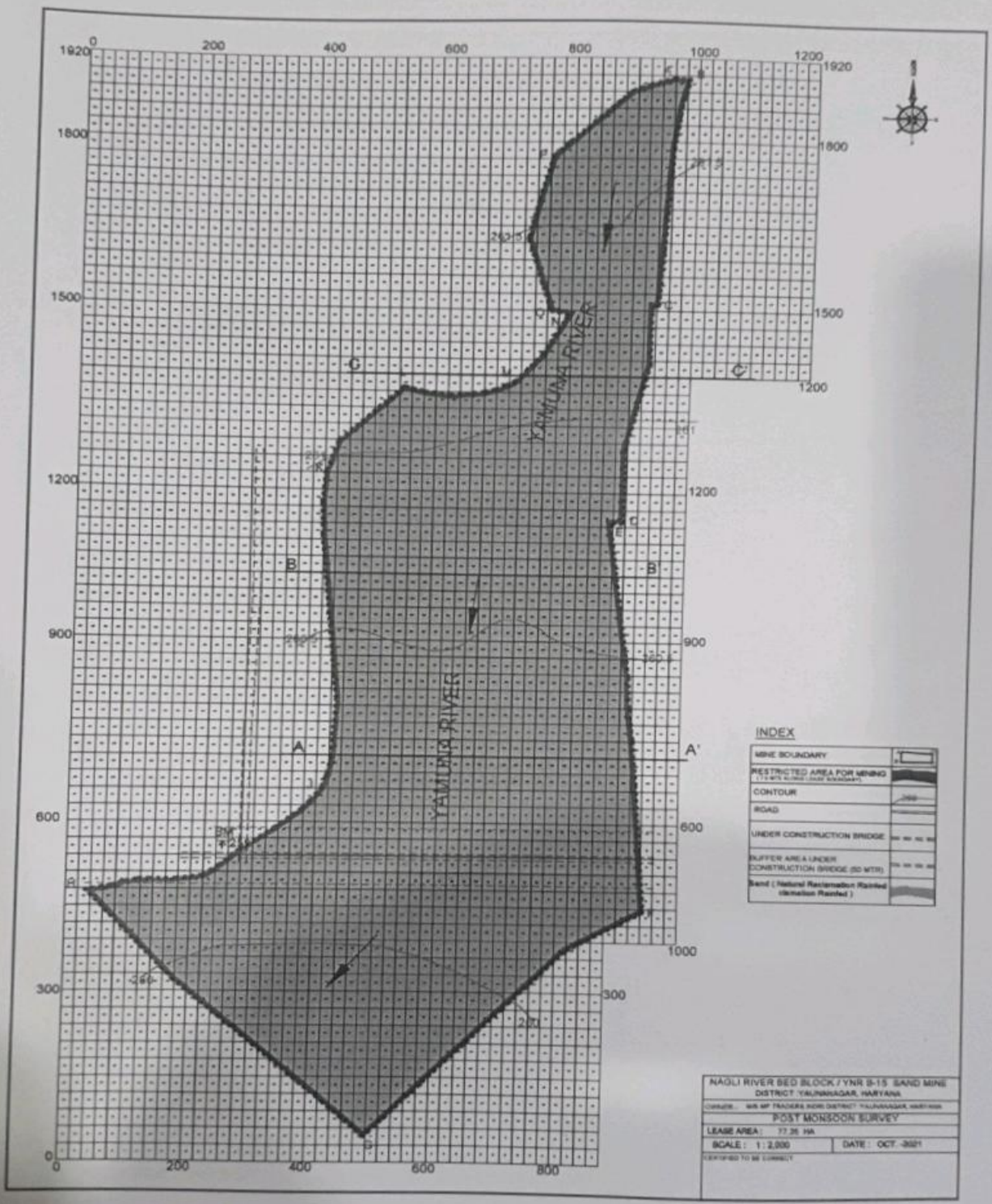
b) Post-monsoon Contour Map (Grid Pattern : 30m x 20m or Part Thereof)



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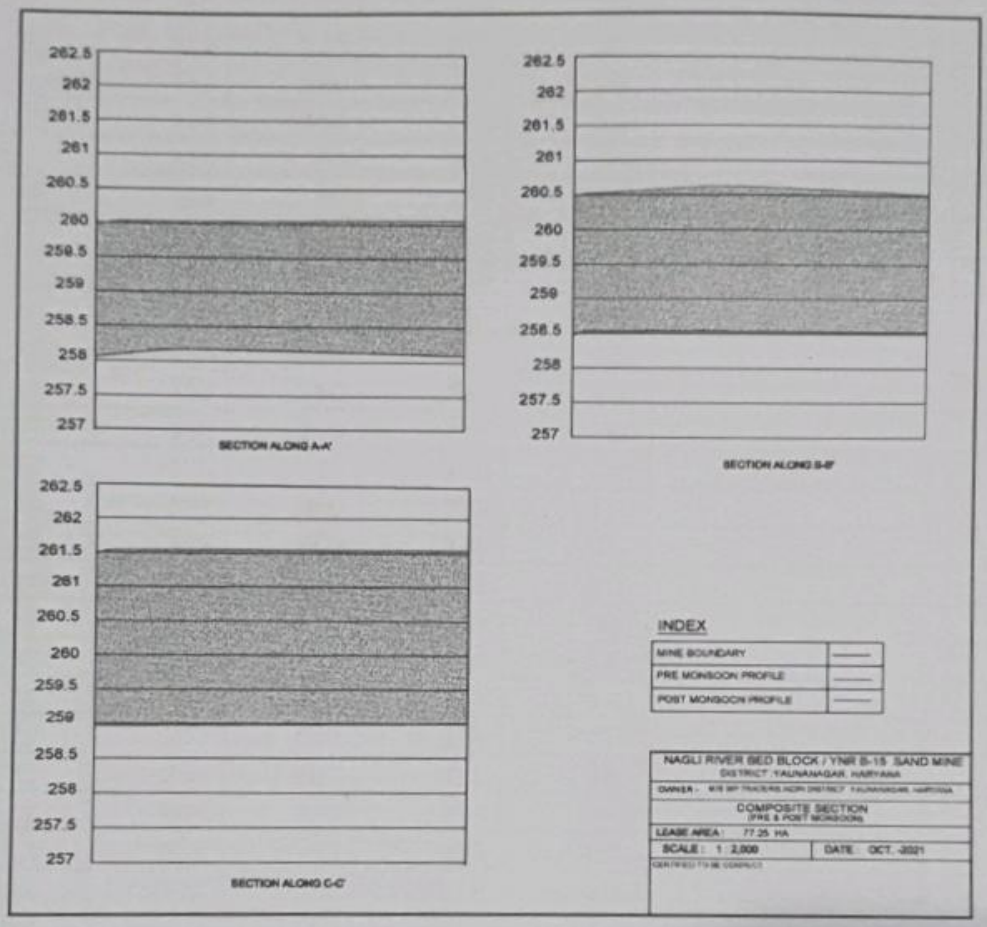
c) Composite section of Pre and Post Monsoon Contour Map



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a) **Tonnage calculation of Sand Replenished.**

SL	Grid	Grid Area	Pre Monsoon Elevation	Post Monsoon Elevation	Difference of Elevation (Pre And Post Monsoon) in m	Tonnage
1	69	20	258	260	2	80
2	112	200	258	260	2	800
3	113	580	258	260	2	2320
4	114	450	258	260	2	1800
5	115	50	258	260	2	200
6	154	50	258	260	2	200
7	155	580	258	260	2	2320
8	156	600	258	260	2	2400
9	157	600	258	260	2	2400
10	158	600	258	260	2	2400
11	159	580	258	260	2	2320
12	160	250	258	260	2	1000
13	196	20	258	260	2	80
14	197	400	258	260	2	1600
15	198	600	258	260	2	2400
16	199	600	258	260	2	2400
17	200	600	258	260	2	2400
18	201	600	258	260	2	2400
19	202	600	258	260	2	2400
20	203	600	258	260	2	2400
21	204	600	258	260	2	2400
22	205	350	258	260	2	1400
23	206	50	258	260	2	200
24	238	20	258	260	2	80
25	239	300	258	260	2	1200
26	240	580	258	260	2	2320
27	241	600	258	260	2	2400
28	242	600	258	260	2	2400
29	243	600	258	260	2	2400
30	244	600	258	260	2	2400
31	245	600	258	260	2	2400
32	246	600	258	260	2	2400
33	247	600	258	260	2	2400
34	248	600	258	260	2	2400
35	249	600	258	260	2	2400
36	250	550	258	260	2	2200
37	251	200	258	260	2	800
38	281	200	258	260	2	800

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Replenishment Study Report for Sand Mine located at Nagli Block, Yamuna Nagar YNR-B-15, Distt:Yamunanagar (Haryana) for production capacity of 22.4 Lakh TPA, Lease Area 77.25 ha.

SL	Grid	Grid Area	Pre Monsoon Elevation	Post Monsoon Elevation	Difference of Elevation (Pre And Post Monsoon) in m	Tonnage
1105	3099	600	259	261.5	2.5	3000
1106	3100	580	259	261.5	2.5	2900
1107	3153	200	259	261.5	2.5	1000
1108	3154	50	259	261.5	2.5	250
1109	3155	600	259	261.5	2.5	3000
1110	3156	600	259	261.5	2.5	3000
1111	3157	600	259	261.5	2.5	3000
1112	3158	600	259	261.5	2.5	3000
1113	3159	600	259	261.5	2.5	3000
1114	3160	580	259	261.5	2.5	2900
1115	3214	20	259	261.5	2.5	100
1116	3215	300	259	261.5	2.5	1500
1117	3216	580	259	261.5	2.5	2900
1118	3217	600	259	261.5	2.5	3000
1119	3218	600	259	261.5	2.5	3000
1120	3219	600	259	261.5	2.5	3000
1121	3220	600	259	261.5	2.5	3000
1122	3221	50	259	261.5	2.5	250
1123	3276	50	259	261.5	2.5	250
1124	3277	500	259	261.5	2.5	2500
1125	3278	600	259	261.5	2.5	3000
1126	3279	600	259	261.5	2.5	3000
1127	3280	600	259	261.5	2.5	3000
1128	3281	200	259	261.5	2.5	1000
1129	3338	100	259	261.5	2.5	500
1130	3339	200	259	261.5	2.5	1000
1131	3340	300	259	261.5	2.5	1500
1132	3341	300	259	261.5	2.5	1500
						2605510

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Conclusion

Replenishment Study for the year 2021 reveals that there is replenishment (Natural Reclamation Rainfed Water Containing Sand) of approximately 26, 05,510 MT of sand after taking in to consideration the 50 m buffer area of newly constructed bridge in the lease hold area.

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REPLENISHMENT STUDY REPORT FOR SAND MINE (MINOR MINERAL)

NAGLI BLOCK- (YNR B-15)

{Lease Area: 77.25 Ha, Production Capacity: 22.40 Lac T/Annum}

PERIOD: 2022 (Pre-Monsoon: June-2022& Post-Monsoon-Oct-2022

PREPARED BY: JBB TECHNOCRAT PVT LTD, NCR REGION, FARIDABAD, HARYANA **(DECEMBER-2022)**
{CIN No. 06AVPAS5608RIZZ}
(Waste Management, Environment and Mining Solutions Consulting)
ISO: 9001:2015 Certified
www.jbbtechnocrat.com (12th DECEMBER, 2022)

SUBMITTED TO:

REGIONAL OFFICER,
HARYANA STATE POLLUTION CONTROL BOARD, YAMUNANAGAR (HARYANA)

SUBMITTED BY:
M/S M.P.TRADERS, Near Nirankari Colony, Indri
District :Yamunanagar (Haryana)

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SUBJECT: REPORT ON REPLENISHMENT STUDY FOR RIVER BED MINING PROJECT OF MINOR MINERAL SAND OF NAGLI BLOCK-B-YNR-15, YAMUNANAGR (HARYANA) OF M/S MP TRADERS FOR THE PERIOD OF 2022

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2) Objective for Replenishment Study

The requirements of the "Replenishment Study" as per the terms of EC letter are as below :Sr. No, 8 of EC :The proponent submitted that before starting the mining operation, initial level(baseline data) of the mining site will be taken, for this purpose section will be cut at30 meter interval along the length of the river and at each section line levels will betaken at an interval of 5-20 meters depending on the width of the river. Theproponent submitted that the baseline data so collected will be submitted to theMinistry within one month of the

grant of EC. The proponent submitted that for annual replenishment study reputed institute/Government agency will be engaged. Additional Conditions of EC (A-vi) :The Project Proponent shall appoint a Monitoring Committee to monitor the replenishment study, traffic management, levels of production river Bank erosion and maintenance of Road etc. The proponent should carry out replenishment study annually to ascertain the quantity of material replenished and production should not be more than the quantity replenished. In case the material replenished is more than the quantity mentioned in this Environmental Clearance then quantity that can be excavated is limited to 22.4 Lakh TPA (ROM). The proponent will submit the replenishment study report to Regional Office, MoEF&CC every year. The proponent should carry out a comprehensive replenishment study considering data collected at same location and at same time for at least three years and same needs to be submitted to Regional Office, MoEF&CC after every three years;

3) Period of Replenishment Study (2022)

a) The Pre-monsoon Period: 11 to 13th June- 2022

b) The Post-Monsoon Period : 8 to 10thOctober-2022

4) Need for present Annual Replenishment Study

- As per Additional Conditions of EC (A-vi) , the Project Proponent should carry out replenishment study annually to ascertain the quantity of material replenished.

- The proponent will submit the replenishment study report to Regional Office, MoEF&CC every year. The proponent should carry out a comprehensive replenishment study considering data collected at same location and at same time for at least three years and same needs to be submitted to Regional Office, MoEF&CC after every three years;

4a) To fulfill to objective of the replenishment study and to comply with the terms of Environmental Clearance (EC) letter conditions the Project Proponent constituted "Monitoring Committee" of following experts for this purpose :

i)	Dr. S.N. Sharma	:	Mining Expert
ii)	DC Yadav		Sr. Geologist
iii)	Yogeshwar P Mishra	:	Environmental Expert cum Drone Survey expert
iv)	Arafat Khan	:	GIS cum Survey Expert

v) Sudhir Kumar : MIS/GIS Engineer

vi) RK Srivastva : Mine Manager

5. Software & Equipment Deployed

Equipment:

- GPS
- Drone

Software:

- Drone Mapper (Software)
- DJI Mavic GPS & Glonass Based Software
- Arc Gis 10.8 (Software)
- AutoCAD 2011 (Software)

In addition to above, Project Proponent (M/S MP Traders) appointed M/S JBB Technocrat Private Limited, Faridabad (Haryana), an Environmental Consulting Company for undertaking

a) Pre-monsoon survey and replenishment study
b) Post-monsoon survey and replenishment study
c) To prepare composite sections of pre and post monsoon survey findings
d) To calculate the volume of sand replenished during study period.
e) Finally to prepare "Replenishment Study Report" and to submit it to the Regional Office, MoEF&CC.

6. Replenishment Study

6.1 General Introduction:

Sediment is a naturally occurring material that is broken down by processes of weathering and, erosion and is subsequently transported by the action of wind, water, or ice or by the force of gravity acting on the particles

Sand is an essential minor mineral used extensively across the country as a useful construction constituent and variety of other uses in sports, agriculture, glass making (a form of sand with high silica content) etc. It is common knowledge that minerals are Non-renewable but this form of mineral naturally gets replenished from time to time in a given river system and is very much interrelated to the hydrological cycle in a river basin. But its over-exploitation and indiscriminate mining supersedes replenishment &optimum extraction is overtaken by profits, extraction has exceeded its replenishment rate and it neglects laws of mineral conservation.

The Rivers originating from the Himalayas bring with them lots of aggregate materials whereas as they move downstream, only finer elements / minerals like sand are found in abundance. Rivers also act as natural administrative boundaries among the states and this gives rise to improper and unclear demarcation of boundaries as the river keeps changing its course from time to time thereby unclear administrative controls and mechanisms becomes a point of excuse for administration for any illegal activity taking in this disputed area. River Yamuna near Dakpathar barrage leaves Uttarakhand and enters Himachal Pradesh.

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

Itinerary of Yamuna River:

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

Itinerary of Drainage area of Yamuna:

The origin of Yamuna is situated in the Yamunotri glacier at an elevation of 6387 mtrs on SE sides of Banderpooch crests, which are located in the Mussoorie range of lower Himalayan range in Uttrakashi district of Uttrakhand, to the North of Haridwar. From this place Yamuna runs to South around 200 Kms across the Shivalik mountain ranges and lower Himalayan ranges.

A significant portion of its beginning of Drainage basin (with total area of 2320 square km) is situated in HP and a major tributary sapping the upper drainage basin in the Tons, which is also biggest and most extensive tributary of the Yamuna. Other tributaries in the area are the Rishi Ganga, Giri, Hanuman Ganga, Kunta& Bata, which sap the upper drainage basin of the huge Yamuna river. Subsequently, the river moves down the terrains of Doon basin at DakPatharclose to Dehradun, in this place water is redirected into a channel for the purpose of electricity generation. Once it goes across the sikh religious place of Ponta Sahib, the river arrives at Tajewala in the Yamunanagar district of Haryana where a dam was constructed in 1873. This dam is the origin of the two major channels or water courses – Eastern Yamuna Canal and Western Yamuna Canal and both drain in UP & Haryana.

The Western Yamuna Canal (WYC) traverses Karnal, Yamunanagar and Panipat prior to arriving at the Haiderpur water treatment plant, which provides a portion of municipal water provisions of Delhi. The Yamuna also forms natural boundary between the states of Uttrakhand& HP and also amid the states of UP and Haryana.

Together with the Ganga to which it flows almost parallel once it meets the Indo-Gangetic plateau, the biggest Alluvial productive area in the World, it forms the Ganges-Yamuna Doab are stretched across 69,000 square Km which is 33% of the whole area.

Drainage system is the pattern formed by streams, rivers and lakes in a drainage basin. In a drainage system, streams or rivers always connect together to form networks. Many factors such as topography, soil type, bedrock type, climate &vegetation cover influence input, output and transport of sediment and water in adrainage basin (Charlton, 2008). These factors also influence the nature of the pattern of water bodies (Twidale, 2004). As a consequence, drainage pattern canreflect geographical characteristics of a river network to a certain extent. There areseveral types of drainage pattern. So far, much research has been done on thedescription of drainage patterns in geology and hydrology (e.g. Howard, 1967;Lambert, 1998; Twidale, 2004; Pidwirny, 2006).

6.2 Physiography:

The area forms a part of the Indo-Gangetic plains and exhibit flat terrain withgeneral slope from north to south. The area is devoid of any prominent topographic features. However, a natural depression exists in north & northwest of Gohana(29˚08′22″N & 76˚42′55″E). The maximum elevation of the plain is 230m above mRL. Topographically the district can be divided into the following units.

Active flood plains along the present day course of the river Yamuna in eastern part of the district. These are generally bordering the active flood plains and are wider, low lying flat tracts.

6.3 Drainage:

The Yamuna which marks the eastern boundary of the Haryana State as well asSonipat district provides the major drainage in the area. The River Yamuna emerges from Yamnotri off the Bansur-Punch glacier in Tehri Garhwal district of Uttarakhand at an elevation of 6330 meters. It emerges into the plains from thefoothills at Kalesar just north of Tajewala.The area constitutes alluvial plain without any conspicuous topographical features and forms a part of the vast Indo-Gangetic plain. The general slope of the area is southwards.

The Yamuna Rivers are plays an important role for the nation and provide water required by various sectors such as irrigation, drinking, recreation and industrial requirements etc. Besides, mining activities are also being carried out in the rivers for the developmental process.Di-siltation (remove of excess sand and stone from river bed) of the river helps tomaintain the carrying capacity and provides protection from flooding during monsoon season. Further, continuous flow of river is essential for ecological and economic needs such as irrigation and biodiversity etc. Drainage study of the river helps to understand potential carrying capacity of water during pre-monsoon& post monsoon season which is generated from rainfall in the watershed and quantity of di-siltation of rivers under mining affected areas.

6.4 Sedimentation. Assessment and Infrastructure

Dandy& Bolton formula is often used to check whether the sedimentation yield exceeds the replenishment rate but the whole question is whether there is adequate monitoring of the river basin, the answer is no as hydrological stations are sparsely spread. Theformula uses catchment area and mean annual runoff as key determinants to give a yield value. It does not differentiate in basin wide smaller streams and their characteristics. CWC distinguishes river basins as classified and non-classified, as perthe latest hydrological data for unclassified River basins; there are 122 GDSW (Gauge, Discharge, Sediment & Water Quality) sites in 12 such basins, the number was 147 in2005. This brings in context the whole issue of scientific mining, thereby indicating thatthe monitoring of sediment yield in rivers / streams within the river basins is essential toarrive at extraction rates and express and conduct environmental studies based on these basin wide characteristics which should become part of the 'Terms of Reference'.**sedimentation,** in the geological sciences, process of deposition of a solid material from a state of suspension or solution in a fluid (usually air or water). Broadly defined it also

includes deposits from glacial ice and those materials collected under the impetus of gravity alone, as in talus deposits, or accumulations of rock debris at the base of cliffs. The term is commonly used as a synonym for sedimentary petrology and sedimentology.

The physics of the most common sedimentation process, the settling of solid particles from fluids, has long been known. The settling velocity equation formulated in 1851 by G.G. Stokes is the classic starting point for any discussion of the sedimentation process. Stokes showed that the terminal settling velocity of spheres in a fluid was inversely proportional to the fluid's viscosity and directly proportional to the density difference of fluid and solid, the radius of the spheres involved, and the force of gravity. Stokes' equation is valid, however, only for very small spheres (under 0.04 millimetre [0.0015 inch] in diameter) and hence various modifications of Stokes' law have been proposed for nonspherical particles and particles of larger size.

No settling velocity equation, however valid, provides a sufficient explanation of even the basic physical properties of natural sediments. The grain size of the clastic elements and their sorting, shape, roundness, fabric, and packing are the results of complex processes related not only to the density and viscosity of the fluid medium but also to the translational velocity of the depositing fluid, the turbulence resulting from this motion, and the roughness of the beds over which it moves. These processes also are related to various mechanical properties of the solid materials propelled, to the duration of sediment transport, and to other little-understood factors.

Sedimentation is generally considered by geologists in terms of the textures, structures, and fossil content of the deposits laid down in different geographic and geomorphic environments. Great efforts have been made to differentiate between continental, near-shore, marine, and other deposits in the geologic record. The classification of environments and criteria for their recognition is still a subject of lively debate. The analysis and interpretation of ancient deposits has been advanced by the study of modern sedimentation. Oceanographic and limnologic expeditions have shed much light on sedimentation in the Gulf of Mexico, the Black Sea, and the Baltic Sea, and in various estuaries, lakes, and fluvial basins in all parts of the world.

Chemical sedimentation is understood in terms of chemical principles and laws. Although the famous physical chemist J.H. van't Hoff applied the principles of phase equilibria to the problem of crystallizing brines and the origin of salt deposits as early as 1905, little effort was made to apply physical chemistry to the problems of chemical sedimentation. More recently,

however, there has been investigation of the role of the redox (mutual reduction and oxidation) potential and pH (acidity–alkalinity) in the precipitation of many chemical sediments, and a renewed effort has been made to apply known thermodynamic principles to the origin of anhydrite and gypsum deposits, to the chemistry of dolomite formation, and to the problem of the ironstones and related sediments.

The factors which affects the "Computation of Sediment" :-

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

7. Approach & Methodology Followed for Replenishment Study of Nagli Block B-YNR-15 (Minor Mineral Sand Mine):-

a) Pre-monsoon survey of River bed with the help of GPS and Drone

b) Grid pattern 30 m x 20 m (30 m along the length of the river and 20 m along width of the river) or part thereof.

c) To draw pre-monsoon contour map (Base map considered as per approved mining plan)

d) Post-monsoon survey of River bed with the help of GPS and Drone

e) Same Grid pattern (30 m x 20 m) or part thereof was considered for survey.

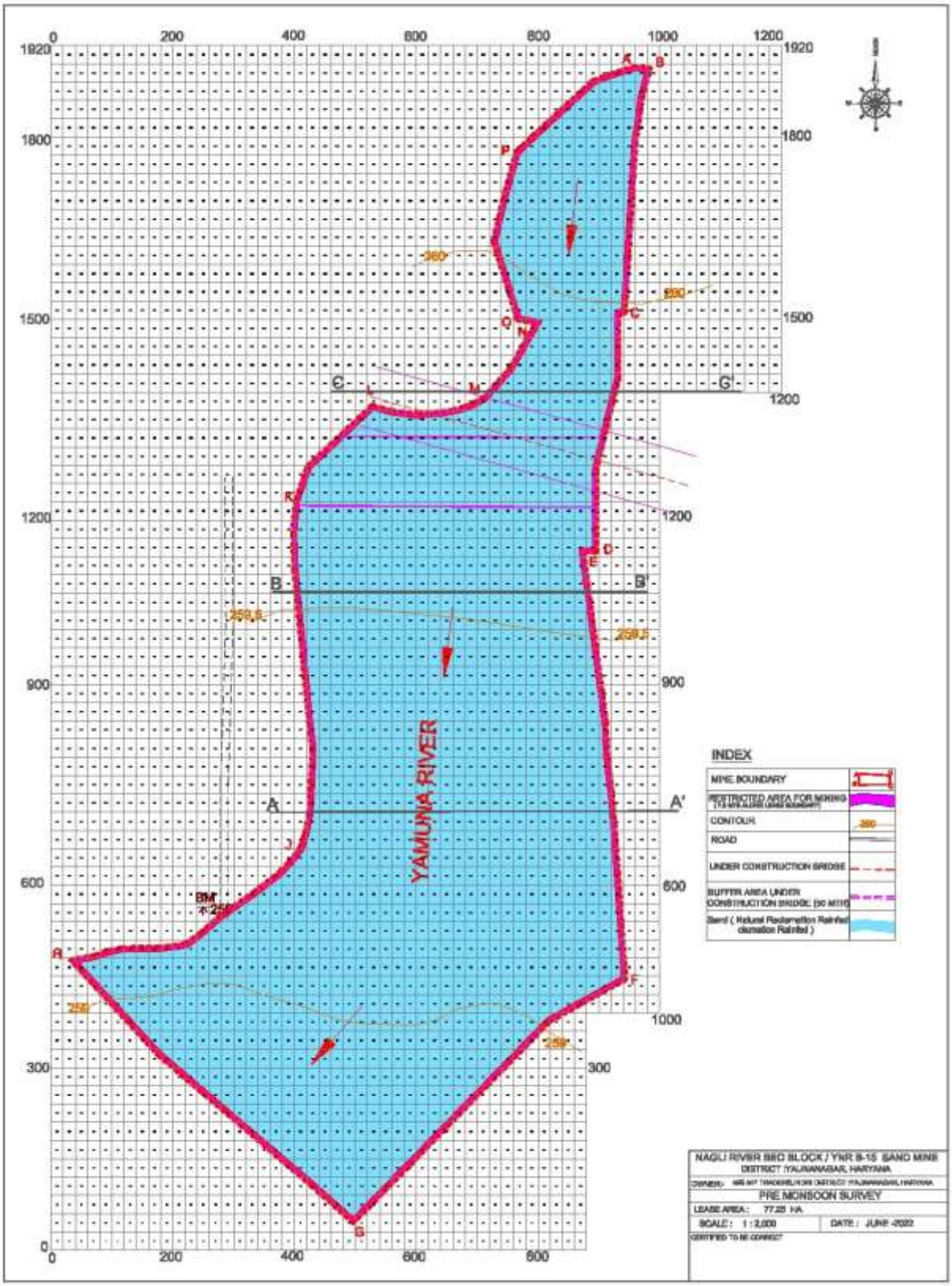
f) To draw post-monsoon contour map (Base map considered as per approved mining plan)

g) To draw composite sections of Pre and post monsoon maps. This will determine the depth and volume of sand replenished.

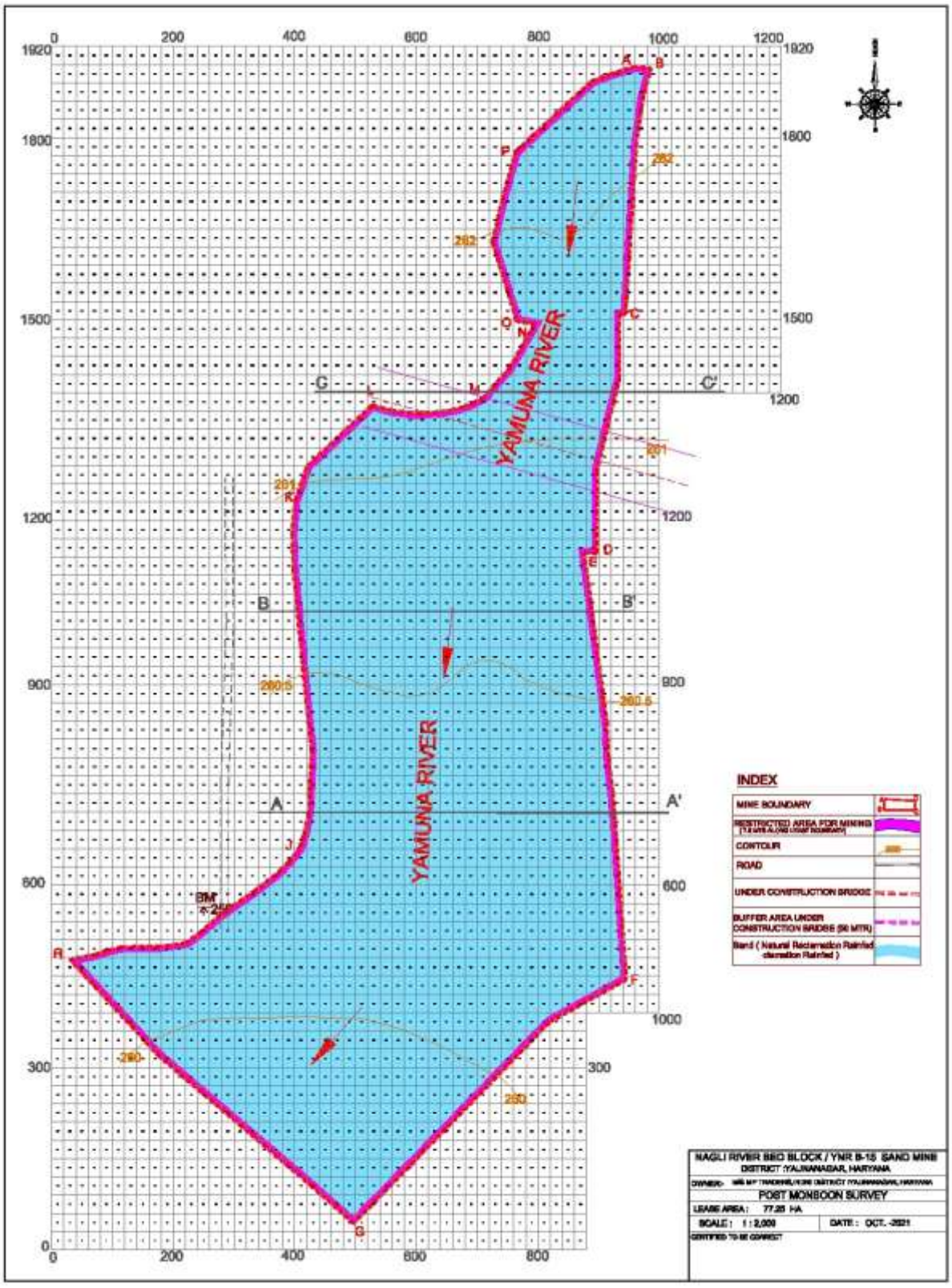
h) Finally to calculate the volume of sand with grid pattern of 30 m x 20 m multiplied by depth of replenishment.

i) The tonnage of replenishment will be volume of sand multiplied by density of sand (which is 2 T per Cubic m)

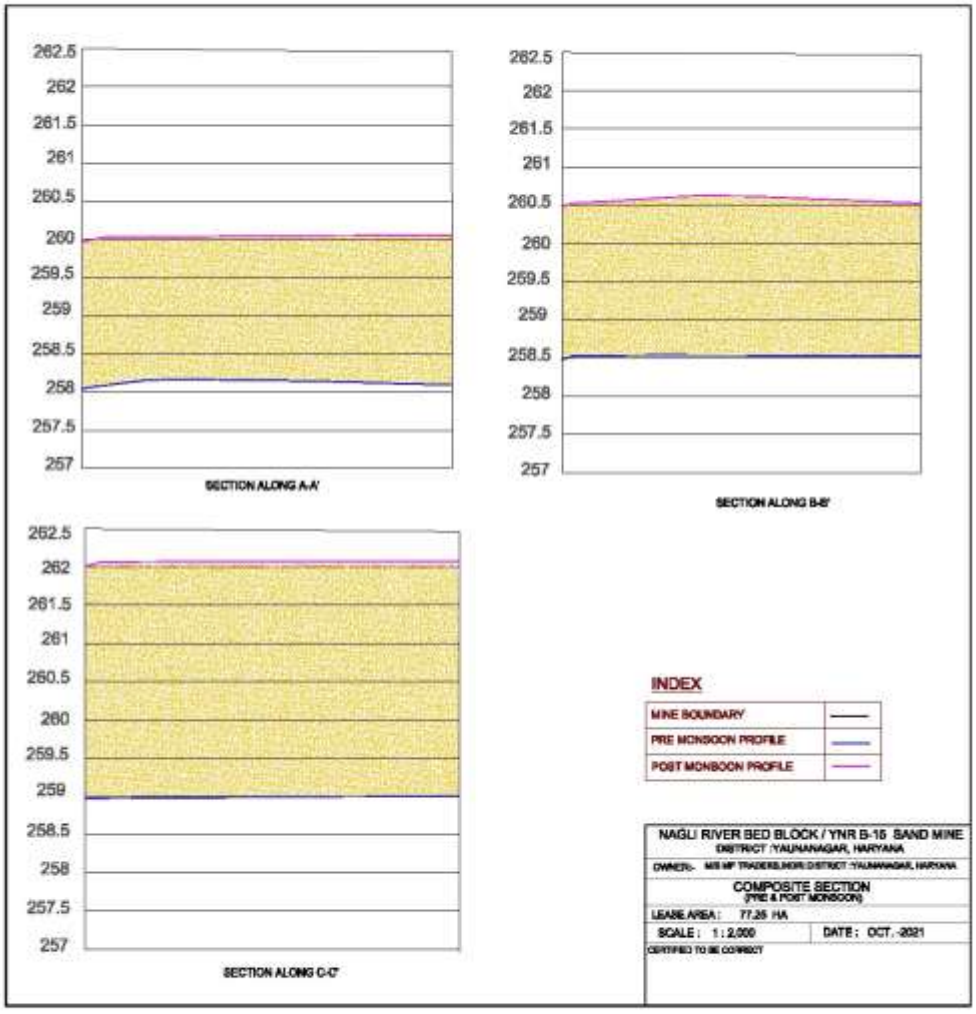
a) Pre-monsoon Contour Map (Grid Pattern : 30m x 20m or Part Thereof))



b) Post-monsoon Contour Map (Grid Pattern : 30m x 20m or Part Thereof)



c) Composite section of Pre and Post Monsoon Contour Map



a) Tonnage calculation of Sand Replenished.

SL	Grid	Grid Area	Pre Monsoon Elevation	Post Monsoon Elevation	Difference of Elevation (Pre And Post Monsoon) in m	Tonnage
1	69	20	259	260.5	1.5	60
2	112	200	259	260.5	1.5	600
3	113	580	259	260.5	1.5	1740
4	114	450	259	260.5	1.5	1350
5	115	50	259	260.5	1.5	150
6	154	50	259	260.5	1.5	150
7	155	580	259	260.5	1.5	1740
8	156	600	259	260.5	1.5	1800
9	157	600	259	260.5	1.5	1800
10	158	600	259	260.5	1.5	1800
11	159	580	259	260.5	1.5	1740
12	160	250	259	260.5	1.5	750
13	196	20	259	260.5	1.5	60
14	197	400	259	260.5	1.5	1200
15	198	600	259	260.5	1.5	1800
16	199	600	259	260.5	1.5	1800
17	200	600	259	260.5	1.5	1800
18	201	600	259	260.5	1.5	1800
19	202	600	259	260.5	1.5	1800
20	203	600	259	260.5	1.5	1800
21	204	600	259	260.5	1.5	1800
22	205	350	259	260.5	1.5	1050
23	206	50	259	260.5	1.5	150
24	238	20	259	260.5	1.5	60
25	239	300	259	260.5	1.5	900
26	240	580	259	260.5	1.5	1740
27	241	600	259	260.5	1.5	1800
28	242	600	259	260.5	1.5	1800
29	243	600	259	260.5	1.5	1800
30	244	600	259	260.5	1.5	1800
31	245	600	259	260.5	1.5	1800
32	246	600	259	260.5	1.5	1800
33	247	600	259	260.5	1.5	1800
34	248	600	259	260.5	1.5	1800

1267	3159	600	260	262	2	2400
1268	3160	580	260	262	2	2320
1269	3214	20	260	262	2	80
1270	3215	300	260	262	2	1200
1271	3216	580	260	262	2	2320
1272	3217	600	260	262	2	2400
1273	3218	600	260	262	2	2400
1274	3219	600	260	262	2	2400
1275	3220	600	260	262	2	2400
1276	3221	50	260	262	2	200
1277	3276	50	260	262	2	200
1278	3277	500	260	262	2	2000
1279	3278	600	260	262	2	2400
1280	3279	600	260	262	2	2400
1281	3280	600	260	262	2	2400
1282	3281	200	260	262	2	800
1283	3338	100	260	262	2	400
1284	3339	200	260	262	2	800
1285	3340	300	260	262	2	1200
1286	3341	300	260	262	2	1200
						2316724

Conclusion

Replenishment Study for the year 2022 reveals that there is replenishment (Natural Reclamation Rainfed Water Containing Sand) of approximately 23,167,24MT of sand.

d) Site Photographs

Advance Service in OA No. 593 of 2023 Mursaleen Vs, State of Haryana & Ors .

1 message

Saurabh <saurabhrajpal.sc.aor@gmail.com> Tue, Nov 4, 2025 at 4:38 PM
To: rkhuranalegal@gmail.com
Cc: dalmialawoffices@gmail.com, hspcbho@gmail.com

Sir/Ma'am

PFA, copy of the objection in the above captioned matter - Mursaleen Vs. State of Haryana OA No. 593 of 2023.
Kindly, consider the present email as advance service and proof of service in the above captioned matter.

Regards
(Saurabh Rajpal)
Advocate For Respoindent No. 18 Delhi-110003
M: +91-9810077085

Final objection_MP Traders.pdf
20453K