

Environmental Impact Assessment and Mitigation Measures of a Sand Mining Project

A Dissertation

*submitted in partial fulfillment of the requirement
for the award of degree of*

**Masters in Technology
in
Environment Science and Technology**

Submitted by

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THAPAR INSTITUTE
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(Deemed to be University)

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. Anamika Gupta had been associated with our organization as an Intern from 15th June 2017 till 14th June 2018.

She was working at the Gurugram office of our organization and her major duties included preparation for EC Application for Category A & B Projects and Preparation of EIA Report of Mining Sector.

Her exposure in these areas has been great. During her tenure with the organization, she has shown a considerable growth being a valuable resource. Moreover, she proactively handled the major responsibilities related to her work.

We take this opportunity to thank her for her contribution and wish her success in all future endeavors.

For Vardan EnviroNet



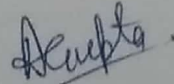

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Date: 14.06.2018

Place: Gurgaon

DECLARATION CUM CERTIFICATE

I hereby declare that the project work entitled 'Environmental Impact Assessment and Mitigation Measures of a Sand Mining Project' is an authentic record of my own work carried out at Vardan EnviroNet as requirement of one year project internship for the award of degree of M. Tech (Environmental Science and Technology), Thapar Institute of Engineering and Technology, Patiala, under the guidance of Mr. R.S. Yadav and Mr. K.S. Babu, during June 15, 2017 to June 14, 2018.



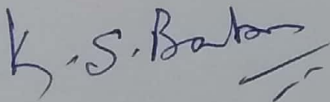
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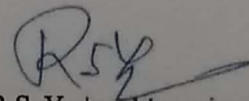
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Certified that the above statement made by the student is correct to the best of our knowledge and belief.



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Acknowledgement

The internship opportunity I had with Vardan EnviroNet was a great chance for learning and professional development. I am also grateful for having a chance to meet so many wonderful people and professionals who led me through this internship period.

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It is my radiant sentiment to place on record my best regards, deepest sense of gratitude to all my seniors in the company for their careful and precious guidance which were extremely valuable for my study both theoretically and practically. I perceive as this opportunity as a big milestone in my career development. I will strive to use gained skills and knowledge in the best possible way.

Last but not the least; I would also like to thank my family for their constant support throughout this internship period.

Sincerely

Anamika Gupta

Abstract

This report is made to put emphasis on Environmental Impact Assessment due to mining of mineral i.e. Sand which is a minor mineral. Mining at any place is done to fulfill the needs of the mankind. With the increasing modernization, for infrastructure development and construction of buildings, some minerals are required that can be used as a building raw material. Mining of minerals has positive as well as negative impacts also. Positive Impact is that it provides employment to the local people. But mining has some negative impact on environment. For evaluation of these impacts on environment, it is mandatory to get the Environment Clearance from the Authorities.

To follow the proper procedure for predicting, analyzing and to overcome those impacts, there is a need to have a proper framework, which is said to be known as Environment Impact Assessment. There are number of ways in which an impact assessment can be done, but according to the need of the project, these methods are chosen so as to best describe the project. It is very important, to know the surrounding and exact location of the project sites for which we can use softwares like Google Earth, WR Plot etc.

This report was basically based on predicting the major impacts and suggesting the corresponding mitigation measures. After analyzing the impact, these impacts were modeled on the software for the calculation of ground level concentration, so that the extent of the impact can be evaluated. We can say that the allotted project has very limited impacts on the surrounding environment.

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Chapter 1- Introduction

1.1 Industrial Set-Up

Vardan EnviroNet (1) is an association of senior state and the focal government resigned officers from different divisions like Pollution Control Board, Mines and Geology, Public Sector Undertakings and different research organizations who have many years of involvement in the field of a condition, arranging, supportability, contamination control, and mining.

The group likewise includes youthful, dynamic and advance driven condition engineers, structural specialists, geologists, GIS specialists, Ecology and Biodiversity master and EHS evaluators.

Vardan EnviroNet has its in-house Environmental Laboratory perceived by the Ministry of Environment, Forests and Climate Change under EP Act 1986, licensed by Govt. of India's NABL (National Accreditation Board for Calibration and Testing Laboratories) and approved by Haryana State Pollution Control Board and Rajasthan State Pollution Control Board. Vardan Envirolab gives dependable and exact testing administrations for an extensive variety of natural parameters and building materials.

Having a container India nearness, Vardan EnviroNet has effectively executed numerous major assorted scopes of projects from mining, substantial building development, township and region advancement, synthetic plants, press and steel plants, refineries, sugar fabricating offices and different segments.

Vardan EnviroNet is a main EIA specialist association authorize by Quality Council of India and Ministry of Environment and Forests (under EP Act 1986) for giving natural administration administrations to mining, foundation advancement, and mechanical activities. Headquartered in Gurgaon; Vardan EnviroNet has unmistakable nearness in Delhi-NCR, Rajasthan, Maharashtra, Madhya Pradesh, West Bengal and Jharkhand.

The Consultancy has accreditation in 16 sectors, out of which I was allotted work in mining sector to find out about the different techniques associated with mining, its effect on the encompassing condition and the relating moderation measures. The section designated to me was a non-coal mining venture, to be specific Mining of Sand (Minor Mineral) at Village-Nagla Rangran, of Yamuna Nagar District, Haryana.

1.2 Importance of the Project

Stream channels and their surge fields are critical wellsprings of development review total materials like sand. The strength of waterway borne coarser clastics and their arranging by fluvial activity make them best reasonable crude materials/elements for building developments. The market request of river sand is high all through the nation for development of foundation ventures. The project site lies on the bed of Yamuna and furthermore on the paleochannels (got from "paleo" or "old", and channel ;) of the waterway. The residue as stream bed material i.e. sand has kept in the last numerous years as a procedure of sedimentation in the paleochannels. Sandbars have been framed at different spots upsetting the stream of water and overabundance statement had changed the state of the waterway bed. Along these lines, amid rainstorm season, the water may transcend the high surge level causing substantial and crushing surges. Such debacles may harm extensive tracts of land laying on both the banks of the waterway particularly the agrarian grounds. Henceforth, it is important to expel the materials with the goal that the waterway gets channelized.

Aside from this, the project will likewise serve the accompanying:

- Generate different business openings particularly to the nearby individuals facilitating the mining venture.
- Economic advancement of the state by adding to state exchequer.

1.3 Objectives of EIA Methodology:

1. To comprehend the nature and area of the task and to discover the possible alternatives.
2. To recognize components of investigations and evaluation targets.
3. Identifying the preliminary impacts and scoping of EIA.
4. Analyses of baseline information.
5. To participate in each and every process of making of EIA report.
6. To predict and assess the impacts.
7. To incorporate all the mitigation measures.

1.4 Mining, Environment and Development

From the season of harappan development, Mineral extraction in India is occurring. However, land history of the India is found back to profound before the development rises. At exhibit organize; around 89 minerals are found in India which incorporates zinc, gold,

lead, copper, press bauxite and uranium. Be that as it may, coal positions the main representing 80 percent of all the mining exercises occurring in the nation. In India, generally speaking there are in excess of 2500 mines of different minerals panning crosswise over states like Jharkhand, Orissa, Chattisgarh, Rajasthan, Gujarat, Madhya Pradesh, Andhra Pradesh and Karnataka.

"In no less than 8 minerals, India possesses a rank among the world's main 10 makers.

Indian Ranking in mineral creation:

- World's biggest maker of mica square and part.
- Third among worldwide chromate produces.
- Third in the generation of coal, lignite, barites.
- Fourth in the generation of iron metal.
- Sixth in the generation of bauxite and manganese mineral.
- Tenth in the generation of aluminum.
- Eleventh in the generation of rough steel." (2)

In the most recent decade i.e. 2001-2011, mining industry watched a quick development of around 3 to 4 percent. Developing interest for crude material from enterprises like power, concrete, steel, manures and development, has constrained government to dispatch more up to date arrangements in mining region. These strategies have prompt the remote interest in mining and connected activities to additionally improve the generation.

The fast increment in mining exercises has brought about adjustment of fresher advancements and most recent mining types of gear these days.

1.5 Reasonable Development outline work (SDF) for Mining in INDIA

It is very much clear that mining is a procedure which isn't possible without causing any adjustment in the scene of the district and it likewise has its related effects. With developing populace at a disturbing rate and fast increment in monetary mechanical action, a considerable lot of the prerequisites are being met by the way toward mining. There is simply a need to change current strategies to more up to date advancements in the event of mining types of gear, the grant or mineral focus framework.

1.6 Mining

Extraction of beneficial minerals or other geographical substances from the center of the earth surface is said to be called as mining. These stores can be mined out from metal body, vein and reef or placer stores. Individuals have been the client of stones, pottery and, later, metals and minerals from the earliest starting point of development, discovered near the earth surface. For businesses minerals go about as real wellspring of both vitality and also crude materials.

Mining as an industry is a fundamental procedure which includes preparing i.e. withdrawal of minerals from the earth and furthermore the investigation of these minerals, proficiently and limiting the harm caused to nature by such exercises. Digging for any creating countries is helpful to have a satisfactory sum and trustworthy supplies of minerals and substances to meet their costs and safeguard needs.

1.7 Stages in the life of Mine:

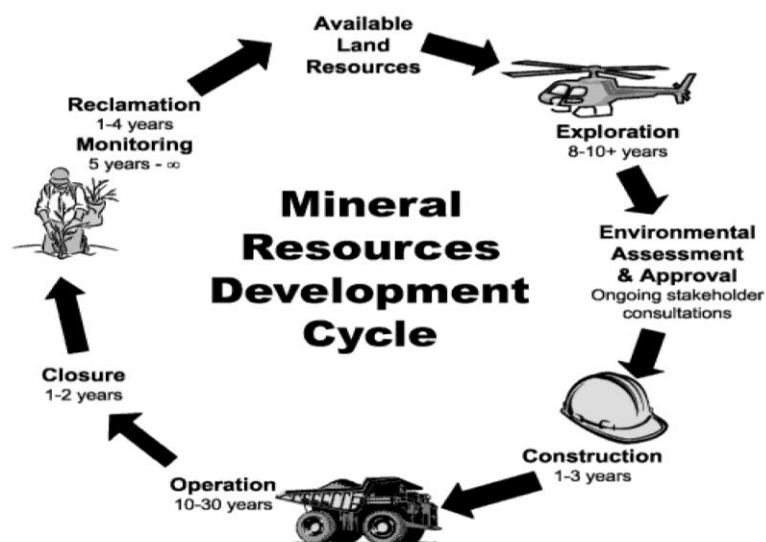


Figure 1:- Life Cycle of Mine

(Source:- (2))

The mining life cycle begins with investigation, which additionally proceeds through generation, and finished up with conclusion and post mining land utilize. With the use of new advances, it can turn out to be beneficial for the digging business and furthermore for the purchasers in all phases of this life cycle. Each period of mining is related with various arrangements of natural effects. These can be separated in parts as:-

- **Prospecting and investigation** - A mining venture can just start with consciousness of the degree and estimation of the mineral metal store. Data about the area and estimation of the mineral metal store is acquired amid the investigation stage. This stage incorporates studies, field studies, and boring test boreholes and other exploratory unearthings.
- **Development and development:** If the mineral metal investigation stage substantiates that there is a sufficiently extensive mineral metal store, of adequate review, at that point the venture defender may start to get ready for the advancement of the mine. This period of the mining venture has a few particular segments. The development of access streets is done either to made accessible overwhelming hardware and supplies to the mine site handled metals and minerals, can have generous natural effects, particularly if get to streets slice through biologically touchy territories or are close already detached groups. On the off chance that a proposed mining venture includes the development of any frontage roads, at that point the ecological effect evaluation (EIA) for the project must comprise of a thorough appraisal of the natural and social effects of these streets.
- **Site arrangement and clearing:** If a mine site is situated in a remote, undeveloped territory, the venture defender may need to begin by clearing land for the development of organizing zones that would house extend staff and hardware. Indeed, even before any land is mined, exercises related with site arrangement and clearing can have critical natural effects, particularly on the off chance that they are inside or contiguous environmentally delicate zones. The EIA must survey, independently, the effects related with site planning and clearing.
- **Site recovery and conclusion:** When mining ends, mine offices and the site are recovered and shut. The target of mine site recovery and conclusion ought to dependably be to restore the site to a condition that most look to some extent like the pre-mining condition. Mines that are discolored for their colossal effect on the earth regularly had effects just amid the conclusion stage, when dynamic mining activities stopped. These effects can proceed for a considerable length of time and notwithstanding for quite a long time. Subsequently, the EIA for each proposed mining venture must incorporate a nitty gritty exchange of the mine Reclamation and Closure Plan offered by the mining defender.

1.8 Mining Techniques

Throughout the years, mining methods have developed drastically, as the advances progresses, improvement in effectiveness and the human wellbeing, and decreasing nature effect of mining activities. Mining can be comprehensively classifies in two kinds i.e.

1. Open cast mining

2. Underground mining

Open-pit mining/surface mining

Open-pit mining is a kind of strip mining in which the metal store broadens somewhere down in the ground, which makes it a commitment for evacuating the tons of overburden and mineral. The utilization of significant apparatus, typically bulldozers and dump trucks, is the most well-known methods for killing overburden. Open-pit mining over and over includes the expulsion of locally vegetated zones, and is subsequently among the most ecologically slandering sorts of mining, particularly inside tropical woodlands. For the reason that open-pit digging is utilized for mineral stores at a broad profundity underground, it more often than not includes the arrangement of a pit that reaches out beneath the groundwater table. For this situation, groundwater must be drawn out of the pit to allow mining to happen.

Underground mining

In underground mining, measure of overburden is expelled to access the metal store. Access to this metal store is picked up by passages or shafts. Passages or shafts make a more level system of underground passages that straightforwardly get to the metal. In this underground mining technique called 'ceasing' or 'square giving in,' areas or pieces of shake are expelled in vertical strips that leave an associated underground depression that is for the most part loaded with established total and waste shake. Regardless of whether underground mining is a not as a lot of naturally ruinous methods for accessing a metal store, usually more costly and involves more prominent dangers than open-pit mining.

1.9 Types of Minerals

Minerals can be isolated into 2 sections i.e. minor mineral and major mineral. Minerals are characterized based on their extraction procedure. On the off chance that the extraction of mineral is exceptionally troublesome, or if the mineral is gotten in metal shape, its preparing will cost high because of the types of gear that would be expected to process these sort of minerals. Consequently, the general cost will be expanded, subsequently the minerals/metals

includes a high scope of handling is said to be fall in the class of Major Minerals. Furthermore, the minerals that don't go under the classification of major minerals are said to be the minor minerals.

In the notice of Indian newspaper on dated tenth February 2015, it is expressed that, as per MMDR Act, 1957 which says {in area 3 (condition (e)) "minor mineral means building stone, rock, normal dirt, conventional sand other sand utilized for recommended purposes, and some other mineral which the focal government may, by notice in the official Gazette, announce to be a minor mineral.

Central government hereby declares the following minerals to be minor minerals in addition to the minerals already declared by notification as minor mineral herein before under the said clause:

Table 1:- Types of Minor Minerals

Agate	Gypsum
Ball clay	Jasper
Barites	Kaolin
Calcareous Sand	Laterite
Calcite	Lime kankar
Chalk	Mica
China Clay	Ochre
Clay (others)	Pyrophyllite
Corundum:	Quartz
Diaspore	Quartzite
Dolomite	Sand (others)
Dunite or pyroxenite	Shale
Felsites	Silica sand
Felspar	Slate
Fire clay	Stealite or talc or soapstone
Fuschite Quartzite	

1.10 Requirement of EIA procedure in Mining

Most importantly there is a need to realize that what precisely an ecological effect appraisal is:

- Ecological effect evaluation or EIA Process is a mix of different fields and additionally is a multistep technique to ensure that the majority of the natural contemplations are dealt with while taking a choice in regards to ventures that may have potential effect on condition.
- This EIA recognizes the likely natural impacts of a proposed project and the measure to be taken to alleviate them.
- The sole reason for the EIA is to tell leaders and general society about the natural results of actualizing a proposed venture.
- EIA go about as specialized device that classifies, figures and assess impacts on the physical condition, and in addition social.

Mining exercises require EIA to forestall natural perils that may win because of a task. It guarantees that all the potential issues are anticipated and are being tended to at first phase of the project arranging as it were. Henceforth this would help in keeping away from the conceivable mix-up while actualizing a venture, either on account of potential hazard to the earth amid the execution stage or because of the alterations that might be required as needs be to make the given errand ecologically acknowledged.

1.11 History of EIA

"The reasoning and standards of EIA can be followed back to a pragmatist way to deal with basic leadership that rose in the 1960s. This requires a specialized assessment to be made which gives the premise to target basic leadership (3-6). This 'technical– reasonable' model has been converted into an entire suite of evaluation, or examination, apparatuses (7). EIA has ostensibly turned into the most broadly perceived and rehearsed of these. This is somewhat because of its solid administrative premise, starting in the United States with the National Environmental Policy Act of 1969 (NEPA). NEPA was sanctioned by the US Congress when the genuine natural harm caused by an extensive variety of human exercises was ending up progressively obvious and the question of developing open concern and political activism, particularly in western majority rules systems. As Lynton Caldwell (8), the key engineer of NEPA, expressed, it "progressed toward becoming law due to a certain groundswell of open request in the late 1960s for government 'to take care of nature'. As he

affirmed, "the United States seems to have been the primary country to react thoroughly to a persistent (however inchoate) open interest for activity to secure the nature of the environment (9).

"There were two sorts of models before - the statutory model that details the evaluation of effect that might be caused obligatory under an authorized law, and the second one was authoritative model which drives the organization practices its tact to see if an effect consider is fundamental or not. In India this regulatory model of EIA was taken after till the year 1992.

Statutory Model-"On 27th January, 1994 a notice was issued managing required EIA. The warning requires venture advocate to present an EIA report, and condition administration design, points of interest of people in general hearing and an undertaking report to the effect evaluation office for leeway, additionally survey by a council of specialists in specific cases. By the revision in the year 1997, open hearing was had necessary before effect evaluation was concluded"(10).

1.12 Information Requirements for leading an EIA:

- There is a need to know the sort, size and area of the project.
- Also there is a need to know every one of those zone which would have the potential effect of the projects execution, for example, on physical assets, natural sources, financial improvement assets, personal satisfaction, and other existing and arranged tasks.

"Environment Clearance Process - According to the EIA warning of fourteenth September 2006 and its correction dated first december2009, mining ventures are separated as following:

Table 2:- Categorisation in Mining Sector

Project Activity	A category	B category	General conditions
Mining of Minerals	Equal to 50 ha of mining lease area in respect of non-coal mine lease 150 ha of mining lease area in	< 50 ha or equal to 5 ha of mining lease area in respect of non – coal mine lease	Any project or activity specified in category B will be treated as category A, if located in whole or in part within 10 km from the boundary of: (i) Protected areas notified under the wildlife (protection) Act, 1972;

	<p>respect of coal mine lease.</p> <p>Asbestos mining irrespective of mining area</p>	<p>Equal to 150 ha or equal to 5 ha of mining lease area in respect of coal mine lease</p>	<p>(ii) Critically polluted areas as identified by the Central pollution control Board from time to time;</p> <p>(iii) Eco-sensitive areas as notified under section 3 of the Environment (protection) Act, 1986, such as Mahabaleshwar Panchangi, Matheran, Pachmarhi, Dahanu, Doon valley and</p> <p>(iv) Inter- state boundaries and international boundaries. Provided that the requirement regarding distance of 10 km of the inter-state boundaries can be reduced or completely done away with by an agreement between the respective states or U.Ts sharing the common boundary in the case the activity does not fall within 10 km of the areas mentioned at item (i), (ii) and (iii).</p>
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Note:-

General Condition (GC):

Any project or activity specified in Category ‘B’ will be treated as Category A, if located in whole or in part within 10 km from the boundary of: (i) Protected Areas notified under the Wild Life (Protection) Act, 1972, (ii) Critically Polluted areas as notified by the Central Pollution Control Board from time to time, (iii) Notified Eco-sensitive areas, (iv) inter-State boundaries and international boundaries.

Specific Condition (SC):

If any Industrial Estate/Complex / Export processing Zones /Special Economic Zones/Biotech Parks / Leather Complex with homogeneous type of industries such as Items 4(d), 4(f), 5(e), 5(f), or those Industrial estates (given in 2006 EIA notification) with pre – defined set of activities (not necessarily homogeneous, obtains prior environmental clearance, individual industries including proposed industrial housing within such estates /complexes will not be required to take prior environmental clearance, so long as the Terms and Conditions for the industrial estate/complex are complied with (Such estates/complexes must have a clearly identified management with the legal responsibility of ensuring adherence to the Terms and Conditions of prior environmental clearance, who may be held responsible for violation of the same throughout the life of the complex/estate).

1.13 Phases involved in EIA

The EC procedure for every one of the tasks will involve most extreme of four phases. These stages are:

Stage (1) – Screening

In the event of class 'B' projects or exercises, this stage will involve the investigation of an application looking for earlier ecological freedom made in Form 1 by the concerned SEAC for deciding if the venture or action requires promote natural examinations for arrangement of an EIA for its evaluation preceding the concede of EC relying on the nature and area specificity of the task. The projects requiring an EIA report might be named Category 'B1' and remaining activities should be named as class 'B2' and won't require an EIA report.

Stage (2) – Scoping

It alludes to the procedure by which the EAC on account of classification 'A' tasks on exercises, and SEAC on account of Category 'B1' ventures or exercises, including applications for development and additionally modernization as well as change in item blend of existing projects on worries for the arrangement of an EIA report in regard of the task or action for which earlier natural leeway is looked for. The EAC or SEAC concerned should decide the TOR based on data outfitted in the endorsed application Form 1 including Tor Proposed by the candidate, a site visit by a sub-gathering of EAC or SEAC concerned just, if considered important by the EAC or SEAC concerned and other data that might be accessible with the EAC or SEAC concerned.

Stage (3) – Public Consultation

"Open Consultation" alludes to the procedure by which the worries of neighborhood influenced people and other people who have conceivable stake in the natural effect of the task or movement are determined with a view to considering all the material worries in the venture on action configuration as proper. All Category 'An' and Category 'B1' ventures or exercises might attempt Public Consultation, aside from the accompanying:

After finishing of the general population counsel, the candidate might address all the material ecological concerns communicated amid this procedure, and roll out fitting improvements in the draft EIA and EMP. The last EIA report, so arranged, might be put together by the candidate to the concerned specialist for evaluation. The candidate may on the other hand present a supplementary answer to draft EIA and EMP tending to every one of the worries communicated amid the general population Consultation.

Stage (4) – Appraisal

Point by point investigation by the EAC or SEAC of the application and other archive like the last EIA report, result of the general population discussions including open hearings procedures, put together by the candidate to the administrative expert worried for the allow of EC.

Terms of Reference (ToR):

Properly taking into account the usually expected ecological concerns, Terms of Reference (ToR) for the part is readied. What's more, the advocate is required to distinguish particular issues assuming any, related to the project and incorporate those issues likewise in ToR for readiness of EIA and EMP endless supply of the ToR by the Expert Appraisal Committee.

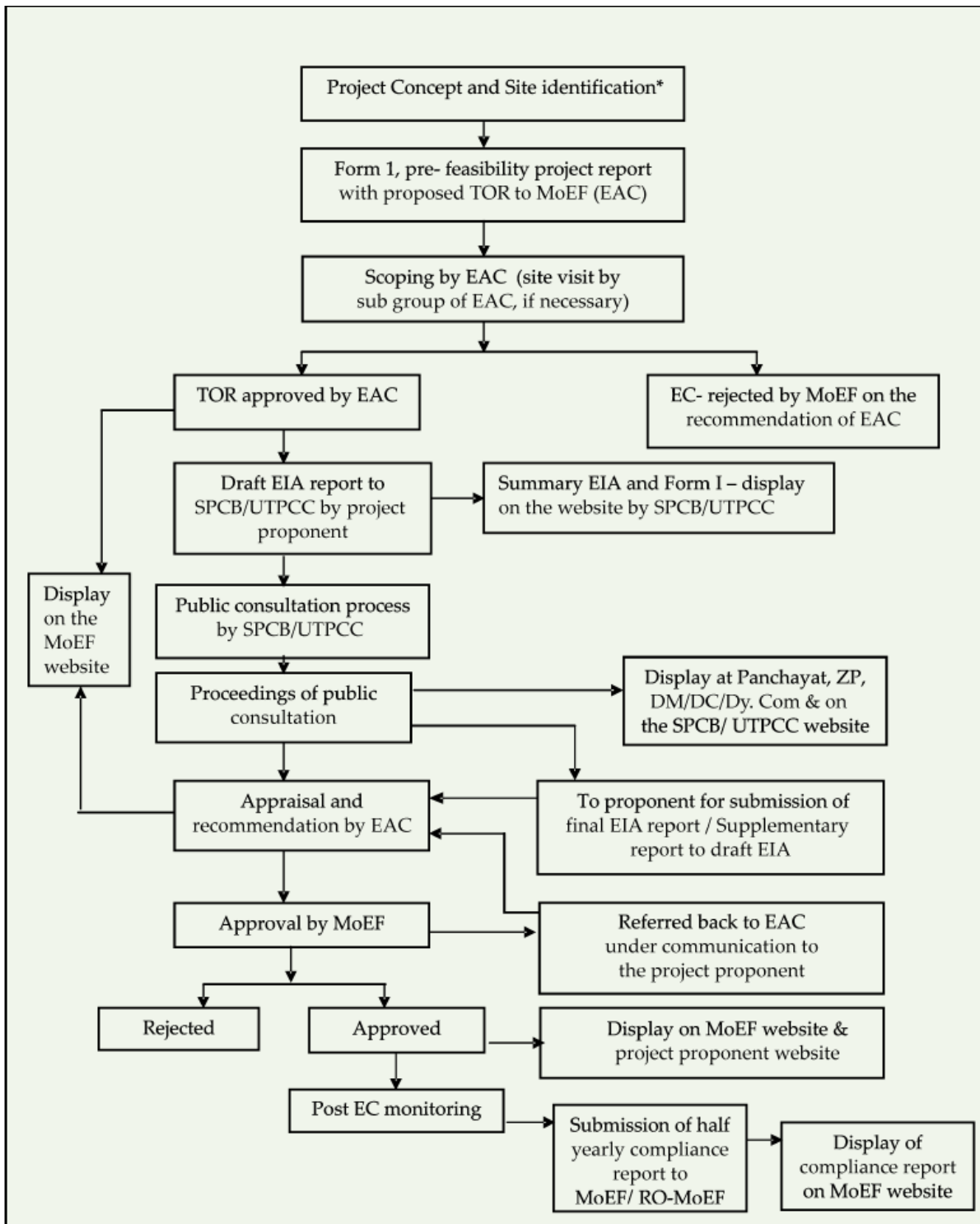


Figure 2:-Prior Environmental Clearance process for category A projects

(Source- Standard ToR on the MoEF&CC Portal)

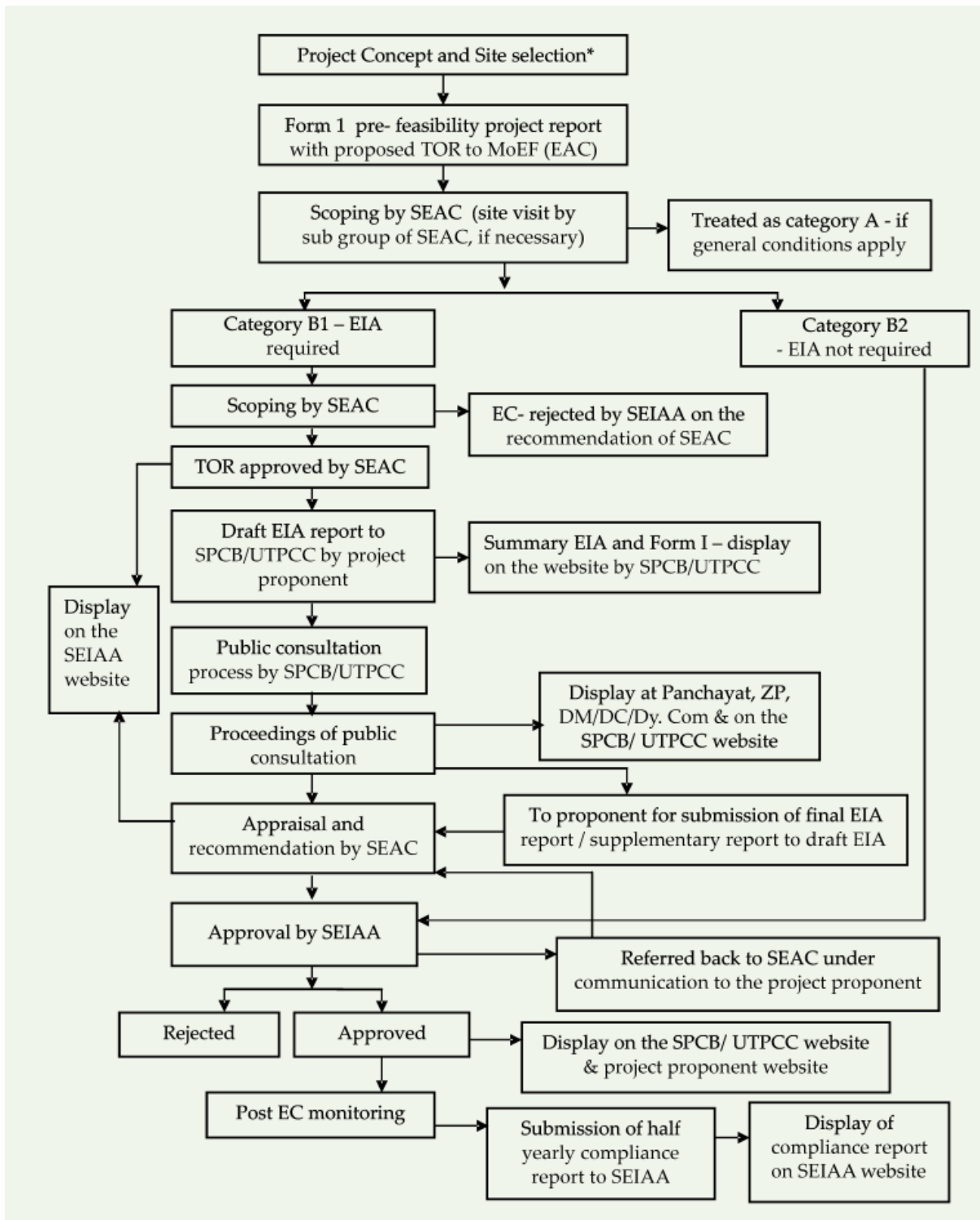


Figure 3:- Prior Environmental Clearance process for category B projects

(Source- Standard ToR on the MoEF & CC Portal)

1.14 Enactment Applicable to mining of Mineral Sector

The mining area has isolate set of enactments covering administration, preservation, allow and activity of mining leases and so on. There are additionally separate enactments for coal mines, non-ferrous mines and so forth likewise, there are ecological/woods controls, appropriate to a wide range of mining exercises have been endorsed by service of condition and timberlands and CPCB.

A couple of critical enactments are given underneath:

- The Mines Act, 1952.
- The Mines and Minerals (Development and Regulations) Act, 1957.
- Mines Rules, 1955.
- Mineral Concession Rules, 1960
- Mineral Conservation and advancement Rules, 1988
- State Minor Mineral Concession Rules, 1960
- Granite Conservation and Development Rule, 1999
- The Water (Prevention and Control of Pollution) Act, 1974
- The Air (Prevention and Control of Pollution) Act, 1981
- The Environment (Protection) Act, 1986
- The Forest (Conservation) Act, 1988
- The Wildlife (Protection) Act, 1972"

1.15 Advantages of leading EIA

- Facilitates educated basic leadership by giving clear, all around organized investigation of the impact and outcomes of proposed ventures.
- Act like some assistance in the choice of options, including the choice of the best practicable and most ecologically inviting choice.
- It is the best technique to anticipate and alleviate the unfriendly impacts of tasks.
- Influences both venture choice and configuration by screening out ecologically unsound tasks, additionally changes attainable activities - Mitigation of negative natural and social effects.
- Serves as a versatile, and furthermore as authoritative learning process, in which the lessons of experience are input into arrangement, institutional and venture outline - Enhancement of positive viewpoints.

Chapter-2- Literature Review

2.1 Project Assigned:-

The project assigned to me was to prepare EIA Report on “Mining of Sand” under the supervision of Experts. Sand comes under the category of minor mineral. Mining of Sand is very commonly done mining these days. Mine lease area is 89.48 ha.

2.2 Need of the Project:-

Building colossal foundation as imagined by Government of India/Haryana Government especially in street and lodging division requires essential building and development crude materials. The Sand being one of essential construction material obligatory for the reason. The mining exercises as projected are the foundation of all development and framework extends as the crude substance for development is made accessible just from mining. The Sand to be unearthed is sought after at the nearby market for land and framework industry. This task will likewise give work to neighbourhood individuals helping them to expand their family unit pay for the advancement of employment. Also, it will additionally anticipate augmenting of the Yamuna stream bed because of the statement of dregs which if not mined out will bring about raising of the waterway bed causing flooding, harm to the abutting zones, annihilation of life and property. The proponent's proposed riverbed mine get 38,60,000 TPA of sand for the satisfaction of the indigenous need of market.

2.3 Purpose of Report

The applicant i.e. project proponent is seeking prior environmental clearance for the proposed Sand (Minor Mineral) Mining project at “Nagla Rangran Block/ YNR B 14” over an area of 89.48 ha with Production Capacity of 38,60,000 TPA.

In the **e-Auction** for this mining project was held on 24.05.2017 and 25.05.2017 on the State Government Web Portal <https://haryanaeprocurement.gov.in> and applicant has offered highest bid to obtain the mining Contract of Sand minor minerals mines namely “Nagla Rangran Block YNR/B-14” for extraction of sand having tentative area of 89.48 Ha. falling in Village- Nagla Rangran, Tehsil Radaur, District- Yamuna Nagar (Haryana) for the lease period of 9 years.

According to EIA Notification 2006 and their ensuing alterations, the proposed venture falls in Schedule 1 (an) and Category 'A'. Since this venture goes underclass 'A', henceforth no

need of screening stage is required, in this way, the task straightforwardly goes to the second stage i.e. of Scoping Stage, which reveals that this venture will be submitted to MoEF&CC for all the further procedures. In this unique circumstance, Form-I and Pre-Feasibility Report should be arranged and submitted for the utilization of Prior Environmental Clearance, to Ministry of Environment and Forests and environmental change (MoEF&CC), New Delhi.

Kanchi Kohli in her blog (11): From the beginning of the human lives, there has been a special relationship between human beings and rivers. River is a great and ultimate foundation of fresh water that can be used for drinking purpose, irrigation purpose etc. But rivers are not only meant for providing water. Riverbed or riverbank that is riverine landmasses has also been in use by people for centuries. Of all the activities one could think of that includes agriculture, transportation, building homes, and everyday chores have always been part of the interaction among land, water and people. Riverbeds have been a constant source of providing raw materials over these years. There is a considerable increase in the mining of sand, gravel and stones and boulders from riverbeds and riverbanks across the country. The loading of mineral like sand and gravel are taking place on daily basis for various reasons. The main factor can be the growth in the real estate business and construction industries. Sand being the important ingredient in construction industry in India today which is used as concrete materials. The buildings, high rise apartments and the big dams would not be possible without the use of these raw materials. Mining of minerals from the bank of the river and from the riverbed causes environmental and social impacts.

Riverbed mining has significant impacts on the surrounding environment that is may causes erosion and also leaves the river plains susceptible to flooding because it may leads to loose landmasses to be washed downstream, especially in the monsoon season. The excavation of minerals can also causes salinity intrusion into the rivers which can cause a higher risk of damage to the life of aquatic animals. Due to the riverbed mining various altercations has been made to the physical characteristics of both river and riverbed. There can be depletion of groundwater during sand mining, especially in abandoned channels, which can cause severe scarcity of portable water and can also affect irrigation. In the year 2012 in the month of february, there comes an order from the supreme court of India that for all the riverbed sand mining prior clearance is required irrespective of the area. The Ministry of Environment and Climate Change has submitted its site inspection report which says that it would be better if 'Cluster Approach' is adopted for baseline data collection, which must effectively cover every single lease area under consideration before seeking Environmental Clearance. This

cumulative impact assessment should also pay emphasis on various aspects related to transportation of mined minerals including pollution, available infrastructure and rate of sedimentation.

“Environmental Impact Assessment” as the name say is an assessment of the impacts on Environment due to a project. Karin Andersson (12) stated that there is always a need of a methodology for evaluating the environmental impacts assessment in a systematic way. Hence EIA, was first introduced in the United States in the early years of 1970s. With time, the use of EIA has extended all over the world. Different methodologies have been developed since then and also adapted by the stakeholders of environment for various purposes in the decision making. This impact assessment has been applied to almost all the projects concerned with the environment.

In twentieth century itself, environmental management had become an important issue to deal with in various sectors. Hence a need for proper system and analytical tools for evaluation of impacts generated to find out the root causes of the environmental issues that may occur. Therefore, methodologies are being adapted and amended on timely basis as per the needs of the hour.

The development in the estimation of mineral creation from 26,567 crore rupees in 1993/94 to 66,308 crore rupees in 2003/04 (MoM, GoI [1996 and 2004]) speaks to a normal yearly development rate of 9.6% in the most recent decade, in any case, a noteworthy piece of this development is because of expansion and if the same is marked down, the normal development in the mineral area comes to 3.6% every year finished the most recent 10 years, for a few minerals, for example, chromite (12.3%), bauxite (8.1%), press metal (7.8%), and limestone (6.3%), the normal yearly development in tonnage delivered (appeared in bracket) has been generous; the expansion in the generation of fuel minerals, to be specific, coal (3.9%), lignite (4.4%), raw petroleum (2.4%), and flammable gas used (5.1%) has additionally been extensive (13,14).

Nupur Chowdhary (15) in her paper has described the role of the regulatory body in carrying out the environment impact assessment. She has reviewed in her paper law developments in the two decades since EIA has been introduced as the regulatory requirement in the year 1994. In developing country like India, it is very difficult to maintain a balance between the economic development and ecological integrity in respect of Environment Impact Assessment. Since then the scope of EIA has been deepen and widen considerably.

The first and foremost aim in EIA procedures is to envisage the potential impact of a development project and to suggest the anticipated mitigation measures to minimize the impact on the surrounding environment. The arrangement of tenets which is additionally called as warnings was first issued by the focal government (Ministry of Environment and Forests (MOEF) in 1994 to act as a regulatory body to protect the environment from the development activities. Hence from there comes a process of taking prior environmental approval for certain kind of projects that are specified in the Schedule 1 - 2006 notification. According to this notification the project proponent (an individual or group of individuals) were required to present a situation affect evaluation report alongside that condition administration design and the points of interest of open hearing led in the region of the task. Hence MOEF act as a decision making body that consists of Experts that would assess the impacts for particular projects.

Then comes the 2006 notifications which initiated 3 changes from the 1994 notifications. First, the formations of State Level Impact Assessment Authority (SEIAA) to consider smaller scale projects i.e. Category B projects and on the other side the MoEF would continue to regulate larger scale projects i.e. Category A projects. Second amendment, although the final regulatory clearance would be decided by the MoEF or the concerned SEIAA, but their decisions would be as recommended by the State Expert Appraisal Committee (SEAC) and the Expert Appraisal Committee (EAC) functioning in the MoEF. Third, the responsibility for public hearing meeting was assigned to the State Pollution Control Board or the Union Territory Pollution Control Committee taking away the responsibility from the project proponent. Hence these three changes were designed to make the process more transparent, rationalized and independent of politicking. In her paper she has also discusses about the various crucial challenges faced in India regarding EIA process. There is a need of greater transparency, ensuring liability of regulators and to increase the participation of public in the matter of their interest.

Dr. Sibas Goswami (16) has discussed in his paper about the mining with special emphasis on coal, on the surrounding environment and the Indian Society. He has mentioned that how on this unstable earth, the ravenous man constantly uses the different sources for his daily life. Mining has always been allied with degradation of natural resources and devastation of natural resources (17). There is a long discussion and at times comparison on underground and opencast mining (18). The geological condition of the area determines the method of mining.

Destruction of natural resources and habitat is closely associated with the mining activity. In underground and opencast mining activity, waste disposal is also a great issue, and the way how the waste would be disposed off affects the very resources such as land, air and water and thus affecting life quality of the people living in the adjacent areas (19-21). The greatest impact that has been realised till now in the underground mining in the form of the health and safety of the mine workers, who worked in the hostile conditions, polluted environment. The underground mines are considered as the death hole in this paper.

A paper by Pratik Dutta et al (22) on cumulative impact assessment has been written to put emphasis on the consideration of cumulative impacts to be the integral part of report of Environmental Impact Assessment. A cumulative study should involve the sector specific methodologies to be followed to address these significant impacts and predicting the mitigation measures.

A bland strategy for aggregate effect evaluation of opencast mining ventures has been created with unique reference to air quality appraisal. It included survey agendas and a geological data framework for perusing of the effect appraisal think about, and the ISCST3 air quality scattering model for the investigation of effects (23-25). Its utilization was delineated by a contextual investigation at an opencast iron metal mine. The strategy could recognize various possibly huge total effects. Additionally, the investigation of air quality effect recommended that in a few regions encompassing the mine the aggregate toxin levels could be essentially high regardless of whether the impacts of project related effect were low.

Since its presentation over 30 years prior, ecological effect evaluation (EIA) has bit by bit formed into an intense arranging and basic leadership instrument. EIA thinks about the ecological results of a proposed venture so remedial moves can be made to improve the unfriendly effects (26). Verifiably, the push of EIA has been on the expectation of changes in the regular and financial condition of single advancement exercises. Be that as it may, concerns have regularly been concentrated on the consolidated impacts of various exercises: it turned out to be progressively evident that the ordinary ways to deal with single task appraisal would not really address the expansive natural debasement over numerous years; specifically, the consequence of total impacts or total effects. As the weight on the natural assets keeps on expanding because of unnecessary advancement weights, combined effect contemplations turn out to be significantly more vital in the EIA procedure. It has been felt,

along these lines, that, without joining combined impacts into natural arranging and administration, it is difficult to move towards supportable improvement (27).

Total effects can come about because of separately minor yet by and large noteworthy moves making place over some stretch of time. These are not new sorts of effect but rather the acknowledgment that effects from singular tasks and exercises can consolidate together in time and space. Thus, to address aggregate effects in an EIA, it is important to play out the key assignments inside the EIA system by expanding the spatial and transient degree of the examination(28). This expanded extent of the EIA is named aggregate impact evaluation (CEA) or total effect appraisal (CIA). Be that as it may, fuse of these contemplations has been insignificant practically speaking due to perplexity over suitable spatial and transient limits in affect ponders, absence of accentuation by the venture defenders and the administration organizations, and all the more critically, the nonattendance of organized strategies (29). Lately, however, thinks about have progressively begun to address this issue and have demonstrated that the current EIA procedures and appraisal apparatuses can regularly be joined successfully to address aggregate effects (30). By and by, the ideas and rules grew so far are to some degree nonexclusive in nature and it is imperative to create division particular techniques. The primary goal of this paper is to introduce a strategy for CIA of opencast mining ventures. The way in which a portion of the basic exercises inside the EIA procedure could be completed to address the total effects is talked about. Opencast mining activities can impact sly affect an assortment of ecological assets. Among these, the air nature of the surroundings coming about because of particulate emanation from the mines is a key effect that should be examined in the EIA. In this way, particular spotlight has been put on the procedure for evaluating impacts on air quality. It has been contended that strategies, for example, poll agendas, land data framework (GIS), and effect models can be joined viably to do the basic exercises inside the EIA procedure. The system displayed here is shown by a contextual investigation of an opencast iron mineral mine in India, for which the CIA was completed utilizing agendas particularly produced for the reason, GIS and an air quality scattering model. The outcomes show the viability of the procedure in deliberately distinguishing and investigating the total air quality effects that may come about because of the project in mix with different ventures.

The correct parts, arranging and the duties regarding completing the EIA procedure depend, all things considered, on the administrative prerequisites of the nation (31). Be that as it may, most EIA forms have a to some degree comparative structure, which is a total of a couple of

exercises to be actualized at different phases of the procedure: screening; perusing; investigation of effects; recognizable proof of relief measures; assessment of the hugeness of effects; announcing; basic leadership; observing; and development. Of these, the focal exercises, including screening, perusing, investigation of effects, distinguishing proof of alleviation measures, and assessment of the importance of effects and detailing, are ordinarily done by the project advocates. The rest, albeit fundamental to EIA, is typically the obligation of the natural offices. Screening to choose whether a detail EIA is required or not is ordinarily illuminated plainly by the natural organizations relying upon the size and unpredictability of the proposition. For example, in India, EIA for mining ventures is required when the rent zone surpasses five hectares. Once unfriendly effects are anticipated, ID of alleviation measures depends, to a vast degree, on the cost and accessibility of best practicable administration frameworks. To choose whether the lingering impacts, after usage of the alleviation measures, are noteworthy and unsatisfactory is frequently a quarrelsome issue and the choice regularly possesses a liquid limit amongst science and governmental issues (32-33).

The activity of the assessor is, in this manner, restricted to giving the data on the consequences of the evaluation with respect to nature, extent, timing, and length, and also the attribution of significance or incentive to the discoveries. This, be that as it may, underlines the significance of the effect examination action of the EIA procedure. Checking is the establishment for a viable EIA that sets up a productive procedure by distinguishing the correct inquiries for which answers are required for basic leadership. On the off chance that investigating isn't conveyed legitimately, the EIA may end up voluminous and may address insignificant or less noteworthy issues in detail while ignoring the more critical ones (34). In this way, the two exercises of checking and investigation of effects are most basic to a sound and financially savvy CIA.

Scoping - Perusing includes the distinguishing proof of key issues of concern the task particular EIA and CIA and the influenced assets, along these lines guaranteeing that the appraisal stays centered and the examination reasonable and practicable (35). The bigger local nature and the multifaceted nature of appraisal imply that checking must be entirely connected to abstain from evaluating more than is fundamental. The initial phase in checking is to recognize the direct effects of the project under examination on the imperative natural assets. For distinguishing proof of these immediate venture related effects, it is vital to get ready efficiently a rundown of exercises that may come about because of the development,

activity and conclusion periods of the task. The following occupation is to recognize the ecological effects of these exercises and the assets influenced by them. Distinguishing other past, present and future activities that have caused, or may cause, impacts and may collaborate with those caused by the project under the audit is basic to setting up the suitable geographic and time limits for the CIA. Just those ecological impacts of different projects or exercises that may join with the natural impacts of the venture being referred to ought to be incorporated into the appraisal. Spatial limits can't be the same for all the natural assets and can be outlined by the thought of undertaking sway zones. The method for deciding the undertaking sway zone for air quality is clarified in the following segment. Air quality effect zones can be created independently for various projects and mapped in GIS. At the point when any cover between the effect zones of project under examination and that of alternate activities happens, it is presumed that the region under the cover zones could be subjected to aggregate effects (36). On the off chance that specific activities don't require any formal endorsement however are important to the evaluation, they ought to likewise be incorporated, particularly if there is an abnormal state of sureness that such moves will make put. Similarly, activities that might be prompted by the task being referred to ought to likewise be considered. At the point when there is inadequate data on future tasks and exercises, best proficient judgment ought to be connected.

Various effects might be recognized that are probably going to influence in total the vital ecological assets, however it is important to restrain the investigation just to those effects that might be huge. Amid checking, the activity– condition connections are just inadequately comprehended, accurate data is constrained, and additionally there is a high level of vulnerability with respect to the potential effects. A subjective the approach, drawing on the past comprehension of the venture qualities and effects, can set up a sound reason for assurance of the effect essentialness (37).

Pradeep S Mehta (38) in his paper on the India Mining Sector portrays the impacts on nature and Foreign Direct Investment inflows in the mining part. He has examined about the minerals, and their accessibility. Characteristic assets like minerals that are non-inexhaustible and indispensable crude materials for the ventures. The earth gets unfavorably influenced with the extraction of minerals from the nature. Thus it additionally aggravates the biology, fisheries, water adjust, nearby atmospheres, natural life, change in the example of rainstorm season, deforestation, and at last the employment of the general population. Consequently financial advancement and natural insurance are nearly related. In a nation like India, which

has wealth of minerals. Mining industry assumes a critical part in India. Outside interest in this segment began in 1990s, however this stream of remote interests in this area faces a few difficulties because of limitations. A portion of the difficulties are:-

- Gigantic speculation required in investigation and the up-degree of innovation.
- Rehabilitation of shut and deserted mine locales.
- Social issues include removal of neighborhood individuals from the encompassing regions, financial differences in the mine destinations.
- Mitigation of the ecological crumbling caused because of mining movement.
- Adoption of greater condition agreeable techniques and innovation for extraction of minerals.

Then again, government at both the levels i.e. at the middle level and additionally at the state level need to detail strategies so mining would be done successfully and in a domain supportable way. The mining segment in India assumes enter part in India's GDP (Gross Domestic Product) and furthermore includes connecting with countless consequently give work by utilizing in excess of a million of laborers which adds to an aggregate percent of around four percent of the India's Employment. In India, About 89 minerals are created, portrayal is given beneath:

- Mineral fills are 4 in number
- Metallic Mineral are 11 in number.
- Non metallic are 52 in number
- Minor Minerals are 22 in number

In India, the mining areas distressed by a few natural and wellbeing related issues. Numerous mischances happened in underground and surface mines because of absence of security measures taken by the diggers. One of the real difficulties that have been talked about here in this paper is about the mine destinations which are not being used at this point. It has been seen that in the state – Bihar, in excess of 500 relinquished mines are available covering the region of around 1800 hectares. These fruitless locales incorporate died down regions, unearthed pits, and overburdens, ruin dumps, and territories influenced by flame. Up until this point, it has been certain that there can be immediate or backhanded effect of mining on the encompassing condition and thus there is a need to address these ecological issues with

the goal that an adjusted is kept up for the valuable advancement of the mining area and in addition for the improvement of the general public.

The general framework and structure of Environment sanctioning in India is set by the National Conservation Strategy and Policy Statement on Environment and Development, issued by the Ministry of Environment and Forests (MoEF) (June 1992) which perceives the accompanying strides so as to incorporate natural contemplations into basic leadership at each progression.

- To forestall contamination at source as it were.
- To support, create and apply the best accessible practicable specialized arrangements.
- To guarantee that the polluter that implies the venture advocate whose movement or project prompts contamination pays for the contamination and control game plans.
- To center around the security of vigorously populated territories.
- To guarantee inclusion of open in basic leadership.

In the wake of getting of Environment Clearance, Policies have been made to guarantee that the activities are being checked by the administrative experts on convenient premise. Thus following are a portion of the approaches that are made obligatory.

- The venture advocate is required to report like clockwork on the execution of the natural defends that were foreordained at the season of Environment Clearance by the managing Authority.
- There ought to be normal site visits by the Central Pollution Control Board and its territorial workplaces for accumulation of tests and information on the ecological exhibitions of the ventures whose freedom has been allowed.
- In the event that, if honest to goodness consistence isn't submitted then the issue would be taken up with the concerned state governments and nodal administrations. Before January 1994, just the tasks that were embraced by the legislature or PSUs planned for super projects need to get Environmental Clearance from the Central Government. In any case, in the year 2006, new notice that was change of 1994, alluded to as the Environmental Impact Assessment (EIA) notice makes an EIA statutory for 40 unique exercises (division), mining is one of them. This 2006 notice incorporates points of interest of techniques for getting Environmental Clearance and contribution of the neighborhood open, additionally the time plans for choice taking.

The EIA notice under the Environment Protection Act (1986), the MoEF needs to finish an evaluation of a proposition inside 90 days of the receipt of all the data and reports. The choice is passed on to the financial specialists inside 30 days from that point. On the off chance that the advisory group does not impart any sort of choice inside the given time allotment, at that point the proposition will be viewed as having esteemed freedom.

In a nation like India, which is as yet creating gets an excessively high offer of asset looking for speculation, which impact sly affects the advancement of a nations. Mining area pulls in numerous remote financial specialists. Because of outside ventures, nation may get few overflow benefits yet for this a substantial sum must be paid. There could be a shortage of characteristic assets. Around the globe, mining part has seen a sensational change because of headway of innovation, computerization and globalization of mining enterprises. Around the globe there have been numerous organizations which has considered the earth issue important and furthermore have shown their responsibility for assurance and up degree in condition while enhancing their execution guidelines. A portion of the mining organizations in India have embraced the strategies that are presently being utilized as a part of different businesses, which prompt upgrades in profitability, security, and ecological assurance. A portion of the cases of waste usage by substantial digging Companies for example are 'The National Mineral Development Corporation setting up a 0.3 million ton pig press plant for the use of trailings' and 'The Kudermukh Iron Ore Company has planned a task to recover 117 million tons of tailings to recuperate 21 million tons of concentrates'.

An ever increasing number of organizations must be urged to receive practices and advancements, which are solid for the earth and guarantee the security of mineworkers. The future heading that must be trailed by the mining organizations is as per the following:

- Resource protection and administration by logical and objective use with least waste in extraction, discovering substitutes of the minerals generally utilized at present, legitimate and wise reusing of utilized metals and scraps and revelation of new stores.
- Adoption of ecological neighbourly advancements.
- Efficient utilization of vitality.
- Afforestation and protection of natural decent variety.

Another point is ecological leeway of FDI proposition of freedom for mining ventures, as requested by financial specialists. The MoEF has expressed that consistence by the mining organizations with the natural stipulations would enhance in days to come. Examination has demonstrated that consistence has been very inadmissible in the accompanying region: development and upkeep of festoon and Check dams, manor on dormant waste dumps, outlaw tidy control, recovery of families influenced by ventures, treatment of water before release and green belt improvement.

Measures to rearrange strategies of Environmental Clearance of Mining Projects:

- Deficiencies in EIA and the Environmental Management Plan (EMP) are being recognized in order to encourage, wherever vital, early accommodation of extra data by financial specialists.
- A agenda has been set up to help speculators in the documentation method.
- Manual for EIA examination has been brought out. The MoEF feels this would be a valuable reference for evaluating offices, administrative experts, business people and specialists.
- Decisions with respect to endorsing a mining venture would be made as quick as could be allowed.
- The status of projects postured for freedom would be shown on the MoEF's site and refreshed fortnightly.
- Guidelines would be utilized to decide the extent of EIA and the EMP for each mining venture.
- Guidelines would likewise be advanced for the gathering of information for key assets, for example, surface water, ground water, verdure, arrive utilize, meteorology and air quality.

2.4 Strategy Implications

As indicated by senior authorities in the Ministry of Coals and Mines, the circumstance on mining leases has enhanced impressively, however remote interest in the mining area has been deferred by two to three years after it was opened to outside venture five years back. The distinctive services of the Central Government have taken measures to enhance FDI inflows in the mining division, accelerate ecological leeway of remote and household speculations proposition and successfully actualize natural enactment. Some different measures could likewise be taken, for example,

- The Government ought not allow mining activities in naturally touchy and rich zones and ecologically and organically delicate regions. It should guide such territories and boycott mining in these zones and set up another rundown of zones where mining is allowed.
- Wastelands created by mining exercises ought to be utilized profitably, and for this reason designs ought to be made and actualized viably. A Reclamation trust subsidize or an execution Guarantee Bond could be set up as in numerous different nations, to utilize badlands and restore debased grounds.
- Old and surrendered mines ought to be restored and put to gainful use by the Government. Collecting a cess on mineral creation could back this.
- There ought to be an all around detailed and adequately executed mine conclusion approach by the Government.
- Environmental Laws must be actualized viably and dirtying mining organizations must be rebuffed.
- Effective ecological control and wellbeing and wellbeing assessment of little mines ought to be set up. The Government could draw out a few rules on this.
- The support of partners like diggers, buyers, nearby inhabitants, natural associations and different individuals from common society would help in the successful execution of ecological laws and directions.
- Some type of ecological pointers for mining ought to be created to aid the appraisal of the condition of the earth in mining regions.
- It ought to be made obligatory for mining organizations to acquire condition testaments e.g. eco-rating.

Henceforth it is hard to quantify the remote speculators in India as for the earth. Despite the fact that the ecological enactment in India is of a long-standing nature, its execution, especially at the State level has ended up being trouble predominantly because of the political circumstance in India in the course of recent years, which has not been conducive to great administration.

Chapter 3 - Materials and Methods

3.1 Methodology:

Professor Doutora (39) in his paper has discussed the key elements to establish the magnitude of impacts, those impacts are:

- Cultural Importance
- Social Importance
- Ecological Relevance
- Environmental Patterns
- Statistic significance
- Technical issues
- Political / Institutional Issues

While examining about EIA, a portion of the fascinating subjects are Public Health, Safety and Security, word related Health, Vulnerable gatherings, Gender, Economic association and prosperity, population development, social and stylish qualities.

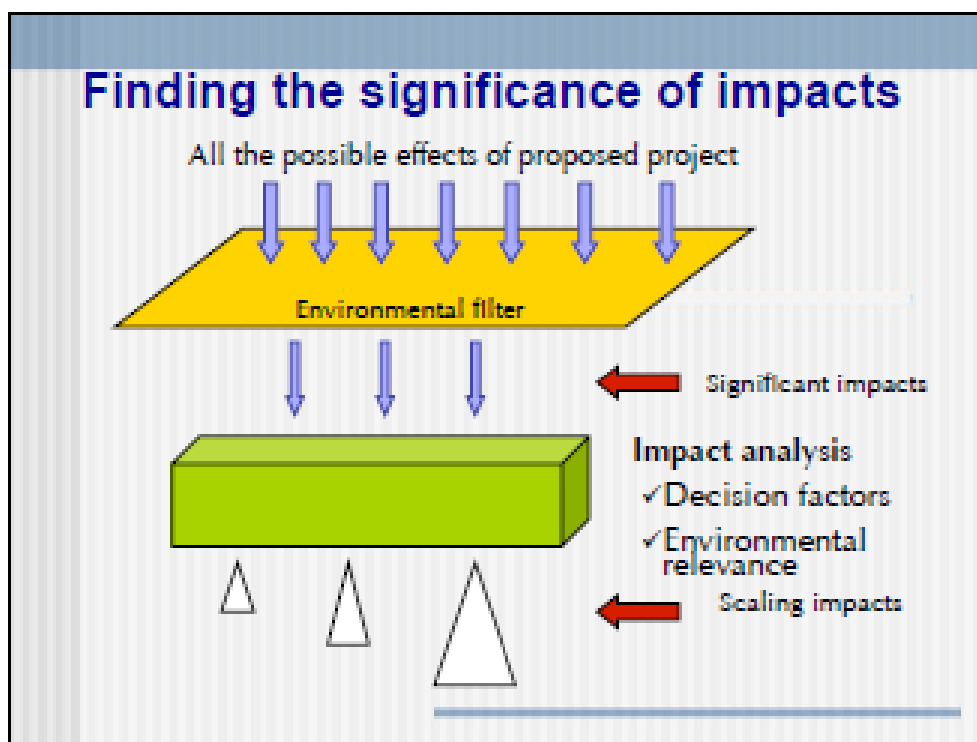


Figure 4:- Significant Impacts

(Source –(39))

3.2 Methodologies that can be followed in EIA:-

Theories are such techniques that are delivered to recognize, predict and regard changes of an action. Reflected in the progression of activities, wanders, too on the extent of biological issues considered (physical, invention, characteristic, budgetary, social, scene regards and methods). Usages techniques and frameworks to gauge or to qualify those movements. All points of view and factors can be assessed, issue is to regard them (40-41).

The headway of Methodologies to review impacts depend upon:

- The associations between local parts (or qualities) and the exercises.
- The specific estimations and the fundamental information to assess the impacts.
- The lightening measures, compensation and advancement.

Objectives of Methodologies are:-

- Understand the nature and region of the endeavor and possible decisions.
- Identify factors of examination and evaluation objectives.
- Preliminary unmistakable evidence of impacts and examining.
- Baseline studies and advancement without wanders.
- Prediction and evaluation of impacts and decisions examination.
- Mitigation
- Monitoring and impacts organization.

A segment of the procedures that can be used as a piece of the assessment of the significance of impacts are according to the accompanying:-

- Experts Judgment
- Checklists and Matrices
- Flowcharts and Decision Trees
- Multicriteria Analysis
- Case Comparison
- Simulation Models
- GIS and guide overlays
- Contingency Analyses

A couple of activities are required in a natural impact consider, including influence unmistakable verification, game plan of a depiction of the affected condition, influence estimate and evaluation, decision of the proposed action from the alternatives surveyed to address recognized issues, and framework and correspondence of information. The goals of

the distinctive activities change, with respect to the pertinent methods for accomplishing the activities. The term 'system' as used in this insinuates composed procedures for accomplishing no less than one of the key activities. The structures approaches incorporate a diverse substantive area inside the biophysical and budgetary circumstances, thusly remembering them from influence gauge systems or models for specific substantive zone. Different systems have been delivered to help in achieving the diverse activities in the EIA methodology.

EIA methodologies can be broadly characterized into participation frameworks and plans, with frameworks addressing assortments of interchanges systems. Collaboration Matrices go from clear examinations of wander practices and their impacts on normal components to wandered approaches which demonstrate interrelationships between influenced factors. Motivation go from fundamental postings of regular factors to particular strategies which consolidate information on estimation, gauge and interpretation of changes for perceived components. It isn't critical to use reasoning in totally in an impact examine; it may be instructive to use fragments of a couple of procedures for certain basic activities. In such way, rationality decision may be seen as a bit of an impact consider. Some alluring characteristics of an EIA system decided for use fuse the going with:

1. It should be legitimate to the vital endeavor, for instance, influence recognizing evidence or relationship of choices (not all methods are also useful for all assignments).
2. It should be satisfactorily free from assessor inclination (the results should be fundamentally reproducible beginning with one assessor group then onto the following).
3. It should be traditionalist to the extent costs and its necessities of data, examination time, staff and equipment and workplaces.
4. While different techniques have been made, and still additional strategies are creating, there is no "general" reasoning which can be associated with all expand forms in each biological setting. It is inconceivable that a generally convenient rationalities will be made, given the nonattendance of specific information and the prerequisite for honing subjective judgment about foreseen impacts in the environmental setting wherein the endeavor may happen. In like way, a fitting perspective is to consider strategies should be wander and territory specific, with the major thoughts legitimate from existing rationalities. These could be called "ad hoc" Methods.

Methods don't give complete responses to all request related to the impacts of potential wander or set of alternatives. Frameworks must be picked in light of fitting evaluation and master judgment, and they ought to be used with the steady usage of judgment in regard to data information sources and examination and comprehension of results. One of the inspirations driving using systems is to ensure that all related normal components are fused into the examination. A champion among the most basic purposes behind using approaches is that they give a path to the amalgamation of information and the evaluation of decisions on a commonplace preface. A basic segment in influence contemplates is the correspondence of resultant information to various experts, authoritative workplaces, and the general populace. A couple of methodology have features which are particularly significant in conferring influence information in summation outline.

3.3 Fundamental Stages in Scoping

1. Impact Identification
2. Impact prediction and evaluation
3. Alleviation Measures to defeat the misfortune because of effect.

3.4 Environmental Impact Identification Matrix

For Impact Identification., the method used is very simple i.e. Matrix Method

Abbreviations Used:

1. LI – low Impact
2. MI- Moderate Impact
3. HI- High Impact
4. AI –Adverse Impact
5. BI- beneficial Impact

Table 3:- Impact Identification Matrix

Activities	Parameters likely to be Affected									
	Land Use	Surface Water Quality	Ground Water Quality	Air Quality	Noise Level	Soil Quality	Flora/Fauna	Social Environment	Health & Safety	
Mining Activity										
Movement of Vehicles				AI	AI	HI	HI	LI	LI	
Use of Machineries		MI		HI	HI					
Loading and unloading Activities				AI	MI	HI			LI	
Population Influx			HI				MI		AI	
Employment								BI		
Plantation	BI			BI	BI			BI		
Waste generation			HI			HI			HI	

From the above matrix method, one can identify that the major impact would be on Air, Noise, Water, Soil, Ecology and Biodiversity, Land, Social Environment and Traffic. While preparation of the EIA report all these parameters were covered for the impact prediction. The two parameters selected on which detailed study has been done for the preparation of this report are Impact on Air and Impact on traffic due this mining project.

For analysing the impacts or for the assessment of these impact, there is a need to know the location, size, description of the project.

3.5 Project description - The project assigned was to prepare EIA Report on “Mining of Sand” under the supervision of Experts. Sand comes under the category of minor mineral. Mine lease area is 89.48 ha. The applicant is seeking prior environmental clearance for the proposed Sand (Minor Mineral) Mining project at “Nagla Rangran Block/ YNR B 14” over an area of 89.48 ha with Production Capacity of 38,60,000 TPA for the lease period of 9

Years. Project site is located in the Village - Nagla Rangaran in the district of YamunaNagar, of Tehsil- Radaur, Haryana. The applicant is seeking prior Environmental Clearance for the proposed project as per EIA notification 2006 and its subsequent amendments. The project is falling in Category-A due to the total area i.e. 89.48 Ha (>50ha) based on the Schedule Clause number 1(a) of EIA notification 2006 and subsequent amendments.

The first step in the process of getting an Environmental Clearance is to apply online for ToR. So, a Form 1 and PFR needs to be filled on the online portal along with standard ToR.

3.6 Location of project:- The project site is in the village Nagla Rangaran, Tehsil- Radaur, of district Yamuna Nagar, Haryana.

This project site can be seen in kml format on google earth software.

The steps are as follows:-

1. Open Google Earth and find the nearest location of the project site.
2. Enter location Yamuna Nagar. Keep all the coordinates of the project site on basis of which the KML file of the project site can be made.
3. On the left side of the Google earth, one can find three options namely Search, Places and Layers which are further divided as follows:-

Search	Places	Layers
Get Directions	My Places	Primary Database which is further divided into following options:-
History	Sightseeing tours	The new Google earth
	Polygon block	Borders and labels
	Temporary Places	Places
		Photos
		Roads
		3D building
		Ocean
		Weather
		Gallery
		Global Awareness
		Terrain

4. By using above options one can use and see as many features as wanted to see.
5. Menu bar of the Google earth provides options like File, Edit, view, tools, Add and Help options.
6. From the Add options in the menu bar, one can add placemark to the point wherever wanted to mark the point.
7. To add placemark there is a point in the search option. But to mark a exact point there is a need of the Coordinates, so that exact location of the project site can be traced.
8. For this given block of Nagla, coordinates are as follows:-

S.no	Latitudes	Longitudes
A	N 29° 58' 56"	E 77° 13' 52"
B	N 29° 58' 55"	E 77° 13' 54.5"
C	N 29° 59' 06"	E 77° 13' 54.5"
D	N 29° 59' 24"	E 77° 13' 59"
E	N 29° 59' 19.494"	E 77° 14' 5.123"
F	N 29° 59' 17"	E 77° 14' 6.8"
G	N 29° 59' 08"	E 77° 14' 4.3"
H	N 29° 59' 01"	E 77° 14' 4.3"
I	N 29° 59' 09.5"	E 77° 14' 14.1"
J	N 29° 59' 8.6"	E 77° 14' 15"
K	N 29° 59' 12"	E 77° 14' 19"
L	N 29° 59' 6.372"	E 77° 14' 18.067"
M	N 29° 58' 35.526"	E 77° 13' 58.447"
N	N 29° 58' 27"	E 77° 13' 59.4"
O	N 29° 58' 30.909"	E 77° 13' 54.347"

P	N 29° 58' 31.805"	E 77° 13' 49.786"
Q	N 29° 58' 30.257"	E 77° 13' 46.081"
R	N 29° 58' 26.367"	E 77° 13' 41.892"
S	N 29° 58' 19"	E 77° 13' 40"
T	N 29° 58' 14.5"	E 77° 13' 42.5"
U	N 29° 58' 10"	E 77° 13' 38.6"
V	N 29° 58' 10.6"	E 77° 13' 32"
W	N 29° 58' 18"	E 77° 13' 32"
X	N 29° 58' 30"	E 77° 13' 34.5"
Y	N 29° 58' 40"	E 77° 13' 39.4"
Z	N 29° 58' 51"	E 77° 13' 46.8"

9. When all the coordinates are placed, select polygon from the menu bar, take the pointer where coordinates are placed. Select the points from A to Z without leaving the mouse click, by selecting all the points a polygon like shape is formed.
10. While making the polygon shape a pop up box appears in which you can change the properties of the polygon. Name of the polygon as Nagla block and can also give the description of the block.
11. On the style color option the size and color of the line can also be changed. Area formed by the polygon can be marked and filled with opacity as desired by the user.
12. By selecting the measurement, perimeter or area of the object can be also be found by selecting the desired units.
13. Use of ruler:-
By using the ruler the aerial distance can also be measured of the nearest railway station, airports, access roads, police station, hospitals, etc.

By selecting the circle on the ruler, user can form a 10km radius circle to see whether any sensitive area like National Parks, Wild life Sanctuary, Archeological importance structures etc is falling in the periphery of the project site.

14. The polygon/shape file obtained can be same in the kml format. After saving the file a kml of the project site is obtained.
15. Kml can be used to determine the exact location of the project site and the route for reaching that site can be seeing by viewing the kml on google earth.

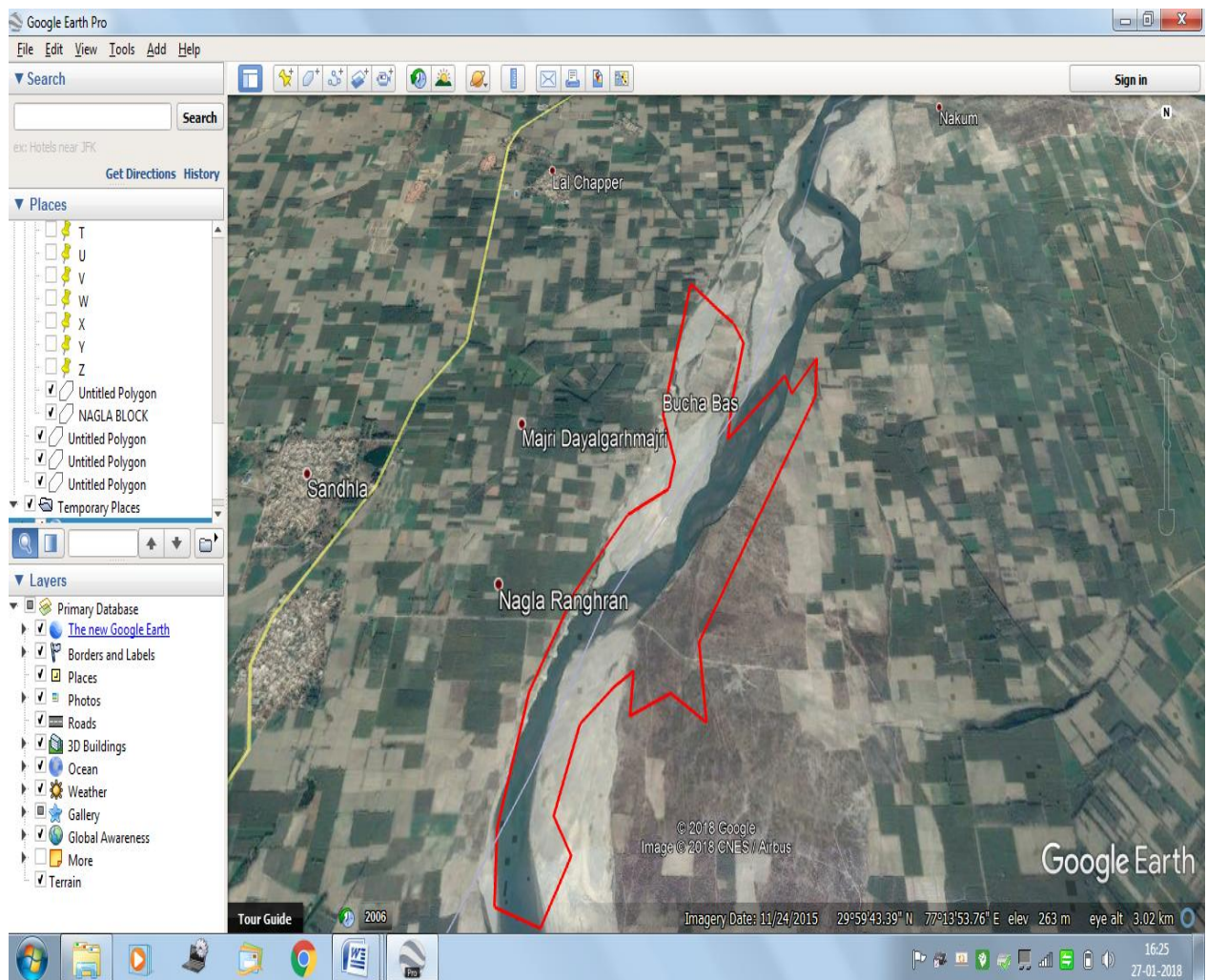


Figure 5:- KML file of Nagla Block

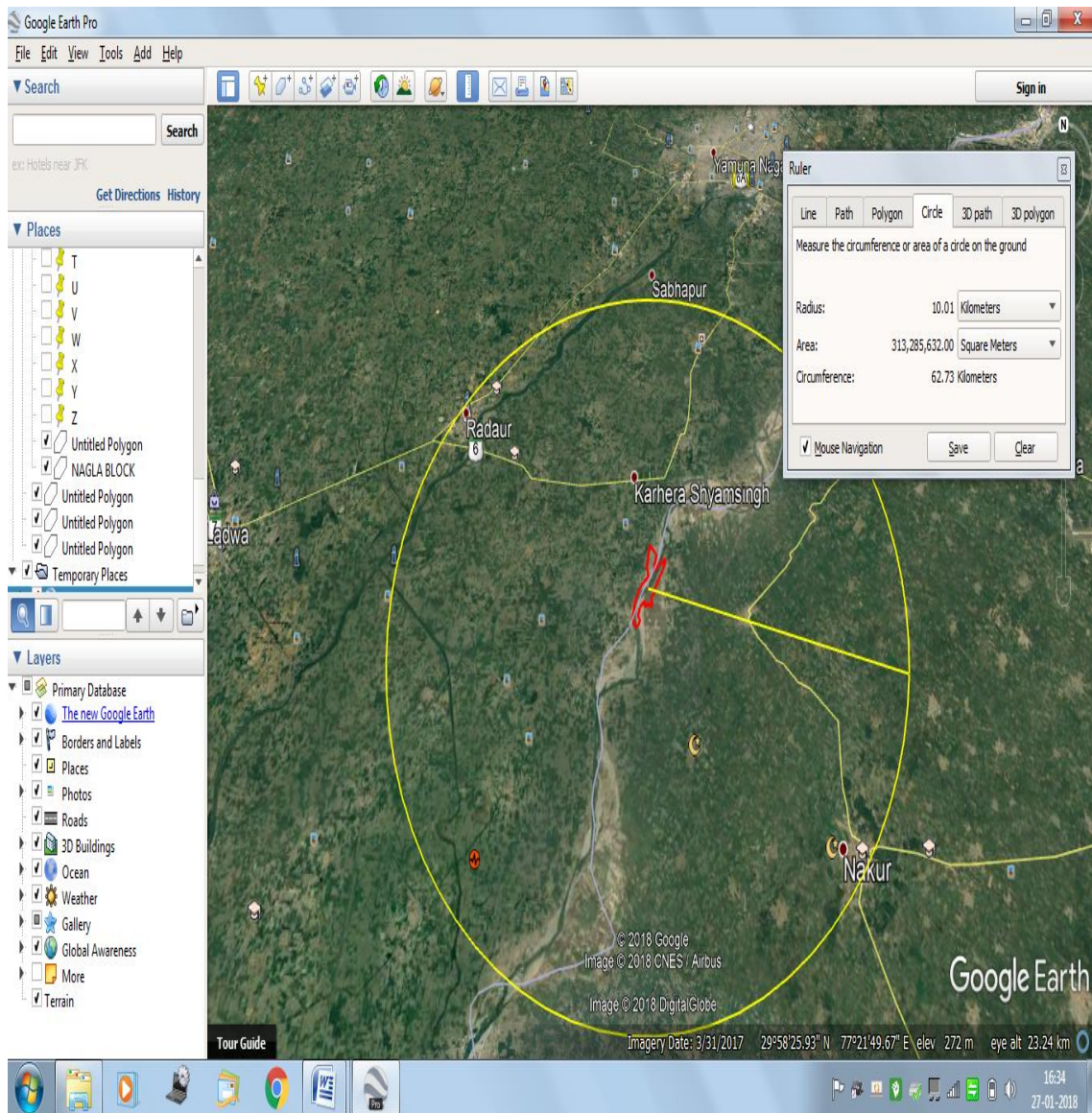


Figure 6:- Circle of 10 Km radius showing the periphery of the project site.

3.7 Terms of Reference (ToR) for this Nagla Block of Mining

When the ToR application is applied on the environmental clearance portal website, within a specific period of time i.e. of 60 days, on the environment clearance portal, agenda for the meeting of ToR can be seen. For this, a ToR presentation is prepared in which, ToR was proposed by the client with the help of Environmental Consultancy, in the ToR meeting that proposed Tor was shown to the MoEF/SEIAA, on the basis of which both the authority decide to grant the proposed ToR, or suggest some additional points at the time of ToR meeting or can be seen in the minutes of the meeting.

On the basis of minutes of Tor Meeting, the standard and additional points are need to be incorporated in the draft EIA

One of the ToR points on the basis of which this Report is made; to carry out the baseline study for one season (non-monsoon) [i.e. March – May (summer season); October- December (post monsoon season); December to February (winter season)], primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so complied presented in the EIA and EMP Report. Site particular meteorological information ought to likewise be gathered. The area of the observing stations ought to be, for example, to speak to entire of the investigation territory and legitimized keeping in see the pre-overwhelming bearing and area of delicate receptors. There ought to be atleast one checking station inside 500m of the mine rent in the pre-prevailing downwind course. The mineralogical piece of PM10, especially with the expectation of complimentary silica, ought to be given.

3.8 Monitoring Location and period of Baseline Environmental Status:-

Study area for the mining projects should be defined as follows:

- Mine lease area should be the “core zone”
- 10 km radius from the boundary limits of the mine lease area of more than 50 hectares should be the “buffer zone”.
- 5km radius from the boundary limits of mine lease area of 5-50 hectares should be “buffer zone”.
- Maps (appropriate scale) of the study area (core and buffer zone), clearly delineating the locations of various monitoring stations (air/water/noise/soil), superimposed on locations of habitats are to be shown.
- Indicate 2km, 5km distance from the boundary limits of mine lease by appropriate line.
- Monitoring and testing should be done as per guidelines of CPCB/MOEF.

Baseline data is required to be gathered by field overview, observing and so forth. Auxiliary information with source ought to be plainly specified. Ordinarily, one season observing information (barring rainstorm) are to be gathered. In any case, Expert Appraisal Committee (EAC) may indicate accumulation of gauge information for a more drawn out period base on the nature, size and area of the venture.

The study area covers 10 Km radius of the mine lease area. Baseline data has been collected out during the **Post- Monsoon Season 1st Oct to 31st Dec 2017 by Vardan Envirolab, Gurgaon {NABL Accredited Lab}** as stated in the guiding principle for EIA that are issued by the Ministry of Environment Forests and Climate Change, Govt. of India and CPCB, New Delhi.

The impact identification always commences with the compilation of baseline data such as Ambient Air Quality, Micro-Meteorology, Ground and Surface Water Quality, Noise levels, Soil Quality, Land use pattern, Biological Environment and Socio-economic aspects, Solid and Hazardous waste, Risk Assessment, Geology and Hydrology within the study zone of 10 Km. radius. Long haul meteorological information recorded at the IMD station, Kurukshetra was likewise gathered. Micrometeorological information at site was recorded utilizing programmed climate station. Aside from these, auxiliary information have been gathered from Census Handbook, Revenue Records, Statistical Department, Soil Survey and Land utilize Organization, District Industries Center, Forest Department, Central Ground Water Authority, Botanical Survey of India, Zoological Survey of India, Geological Survey of India and so forth. The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried out during post monsoon season.

The EIA study is being carried for the Mine Lease (core zone) and area within 10 Km distance from mine lease boundary (buffer zone), both of them together comprises the study area. The data given hereunder which is originally collected through field survey and other sources, for preparation of the EIA/EMP for the proposed mining area with related facilities.

- Substantial Environment such as Air, Water, Soil and Noise.
- Significant meteorological data, for previous decades from Indian Meteorological Department (IMD) and primary data.
- Land use pattern within core zone and buffer zone (10 Km distance around the core zone) based on Survey of India Toposheet map, ground truth and satellite image.
- Identification of water bodies, hills, roads etc. within 10 Km radius.
- Eco-sensitive places, sanctuaries, biosphere reserves within 10 Km radius.
- Religious places / historical monuments and tourist places within 10 Km radius.
- Particulars of fauna and flora within a distance of 10 Km from the project site and information about forests, if any.

- Demography and Socio-financial in view of last accessible Census information for whole examination zone.
- Major industries within 10 Km radius.
- Study of present ecological assurance and moderation measures in close-by working comparative undertakings, assuming any.

In this report, a point by point think about is being done significantly on two effects i.e. Effect on Air Quality and Impact on Traffic because of this mining venture.

The Secondary data was collected from the IMD station Kurukshetra.

3.8.1 Meteorology

Meteorology assumes a noteworthy part in the scattering of toxins, once released into the environment can't be controlled. Since the meteorological components show wide instabilities with time, huge comprehension can be drawn just from whole deal strong data. Such wellspring of data is the India Meteorological Department (IMD), which keeps up an arrangement of meteorological stations at a couple of basic critical areas. The closest IMD station to the examination territory is situated at Kurukshetra (~50 km from the proposed venture). The Meteorological parameters obtained from this station are temperature, moisture, precipitation, wind speed, and wind heading et cetera. A littler scale meteorological station was acquainted at site with record micrometeorological parameters on hourly introduce in the midst of look at period to grasp the breeze plan, temperature assortment, relative dampness assortment etc.

3.8.2 Climate of the Area

The atmosphere of Yamuna Nagar region can be delegated subtropical storm, mellow and dry winter, sweltering summer and sub-damp which is fundamentally dry with sweltering summer and chilly winter aside from amid rainstorm season when wet demeanor of maritime cause infiltrates into the region. There are four seasons in a year. The sweltering climate season begins from mid March to a week ago of the June took after by the southwest rainstorm which keeps going up to September. The progress time frame from September to November shapes the post storm season. The winter season begins late in November and stays up to first seven day stretch of March.

3.8.3 Rainfall of the Area

The ordinary yearly precipitation of the region, in light of the record for the period 2012-2016 is given beneath. Normal yearly precipitation in 5 years (2012-2016) is 268.78 and the base was 174.00 mm in 2012 and most extreme was 391.00 mm in 2015. As for each the aftereffect of examination of 5 years precipitation information demonstrates month August is the month on which greatest precipitation happens in the region though the base precipitation span is month November.

Table 4:-Monthly Average Rainfall (in mm) (for year 2012-2016)

Months/Year	2012	2013	2014	2015	2016
January	4.9	20.8	0.3	6.6	0.3
February	0.0	42.6	15.8	15.2	2.0
March	0.0	14.5	15.3	55.8	18.0
April	5.1	0.0	0.0	40.1	0.8
May	1.3	0.0	4.2	5.3	28.0
June	2.3	35.9	29.4	32.9	11.7
July	41.0	31.8	57.6	109.6	60.6
August	84.7	131.4	5.9	90.4	98.9
September	31.5	21.3	94.4	28.3	8.5
October	0.0	7.7	8.6	4.0	0.0
November	0.0	0.0	0.0	1.8	0.0
December	3.2	0.0	12.6	1.0	0.0
Total Rainfall	174.00	306.00	244.10	391.00	228.80

(Source-

[http://hydro.imd.gov.in/hydrometweb/\(S\(v05qzcnruhufk45g0ejnhbn\)\)/DistrictRaifall.aspx](http://hydro.imd.gov.in/hydrometweb/(S(v05qzcnruhufk45g0ejnhbn))/DistrictRaifall.aspx))

3.8.4 Meteorological Status at the Project Site

The station was set-up at site to record surface meteorological parameter during study period; 1st Oct 2017 to 31st Dec, 2017. The nearest IMD station is taken at Kurukshetra.

3.8.5 Climatology during study period (Oct to Dec 2017)

- Maximum Temperature : 30 °C
- Minimum Temperature : 6.1 °C
- Relative humidity : 69 %
- Wind speed : 1.3 m/s

Table 5:- Meteorological Condition of the Study Area

Month	Temperature °C		Relative Humidity %		Wind Speed (Km/Hr)	
	Max	Min	Max	Min	Max	Min
Oct. 2017	30.0°C	17.7°C	60	40	0.55	0.19
Nov. 2017	26.4°C	11.6°C	62	39	0.46	0.15
Dec. 2017	20°C	6.1°C	70	41	0.42	0.14

3.8.6 Relative Humidity

The humidity is highest in July, August, and September.

Table 6:- Monthly Average Relative Humidity (%)

Months	Maximum	Minimum
January	75	48
February	70	44
March	61	34
April	44	25
May	42	27
June	55	38
July	75	64
August	80	69
September	71	56
October	61	40
November	63	41
December	72	47

Average	64	44
---------	----	----

3.9 Wind Speed and Wind Rose Diagram

Wind speed and wind bearing information recorded amid the examination time frame is valuable in distinguishing the impact of meteorology broadcasting live nature of the zone. In view of the gathered meteorological information, relative rate frequencies of various breeze bearings are figured and plotted as twist roses of Sixteen headings viz., N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW and NNW for twenty four hour span separately. Most extreme and least temperatures including rate relative stickiness were recorded at the same time.

Steps to be followed in making of Windrose

1. Download Lake Enviro Software and install it.
2. WR plot view icon appears. Click to open it and then select OK.
3. In the menu bar, select tools. Now select Import from Excel.
4. A Window opens, open the Excel file of Kurukshetra IMD Data.
5. In the data field option. Give the Excel Column Name in front of the respective data field Name
6. In 'Unit in Excel file', select the "hour" range i.e. 0 to 23 or 1 to 24. Select the wind speed in m/s
7. In the station information. Fill the station ID, City, state and the latitude & longitude of the station.
8. Select the Import option.
9. A file in Sampson format is created. Now close the 'Import Surface data from Excel file' window.
10. Now on the WR Plot View, select the add File option. Add the Sampson file and open it.
11. Now one can see the Met Data Information, frequency count, frequency distribution, Wind Rose and Graph.
12. Now, I can see the Windrose in wind direction of my choice. Here I have selected Wind Direction as 36 and Wind Classes as 6 to get the exact Plot.
13. Orientation is usually taken in – Direction (blowing From) which means that the effect is in the opposite direction. Hence monitoring locations are selected where effect is most dominant

14. By selecting flow vector (blowing to), means effect is in the direction of Windrose formed.
15. In the options one can change the grid and the color of the Windrose.
16. Save the file in the desired location.

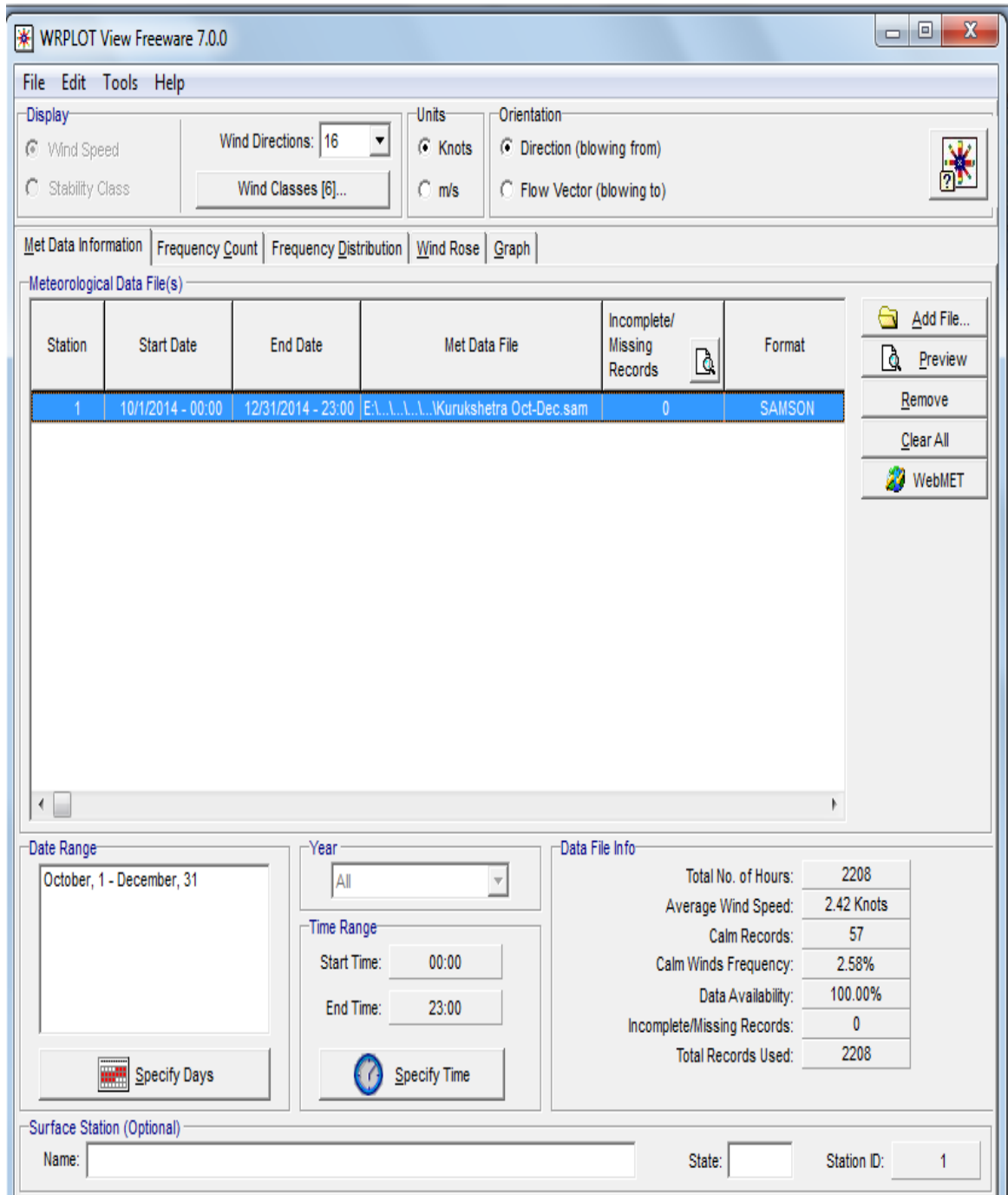


Figure 7:- Adding the Sampson file.

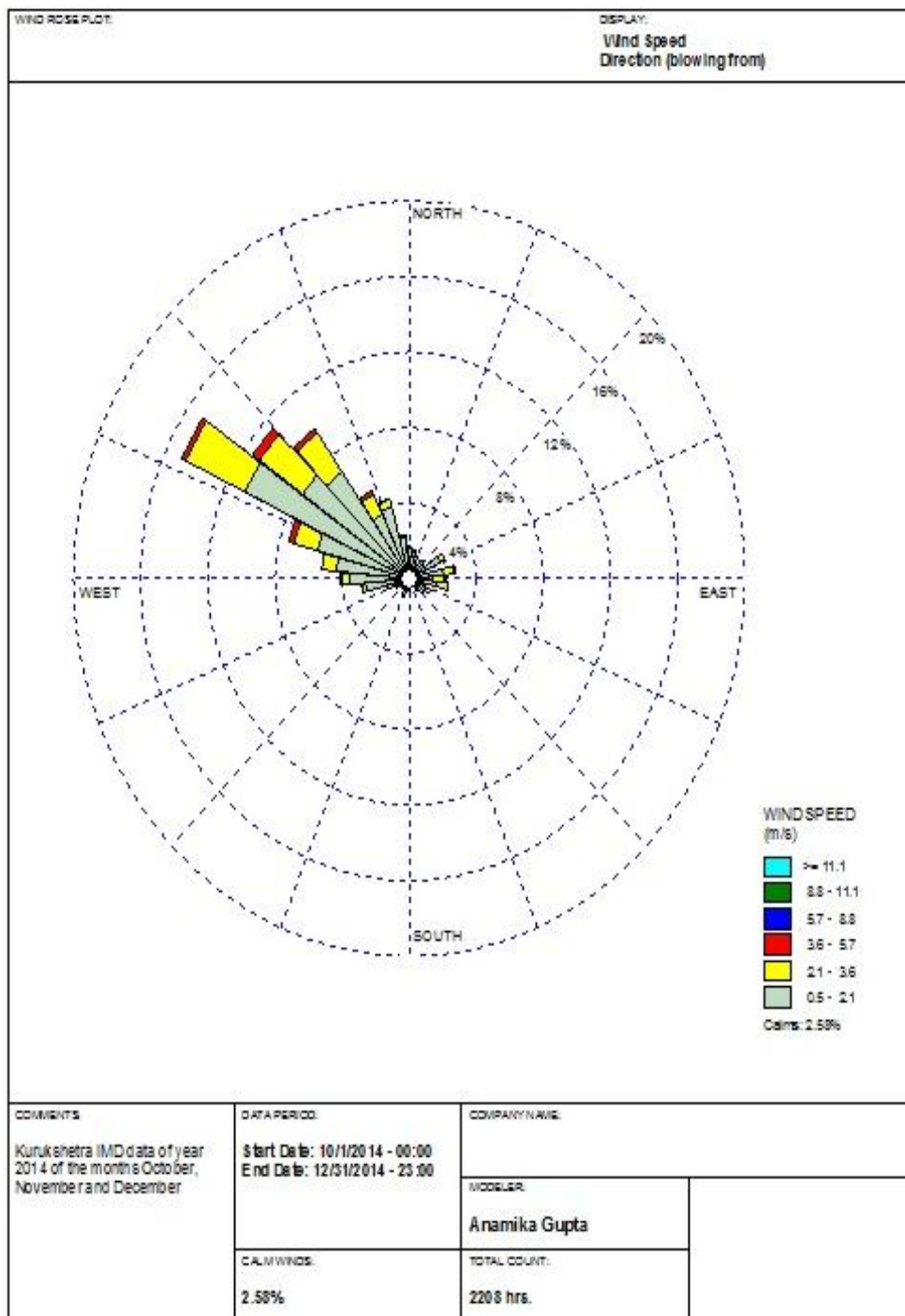


Figure 8:- Direction flowing from

The average wind speed (1.3 m/s) was recorded in the proposed project site and wind rose diagram plotted from the monitored data and the predominant wind direction has been given. The wind rose diagram shows that the first predominant direction of wind blow is ESE and second direction SE which reflect that the generated pollution will disperse in ESE at SE

direction so the strategies should be made for the reduction for their adverse impact on sensitive receptors of the same direction.

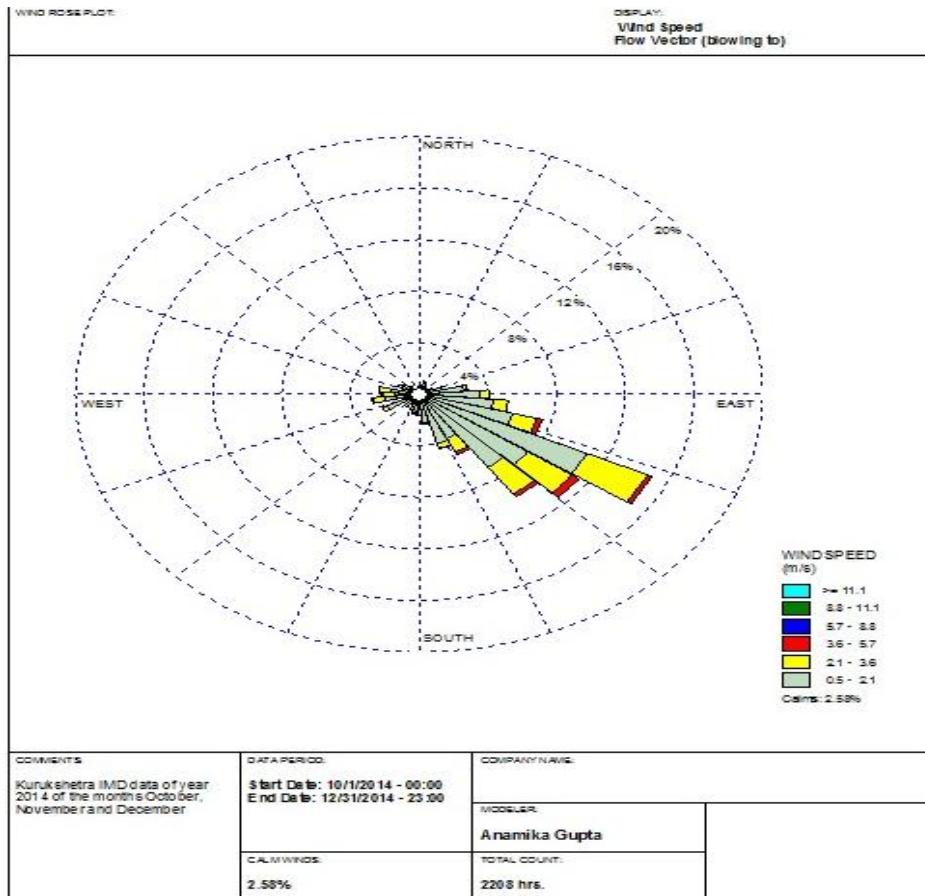


Figure 9:- Flow vector (blowing to)

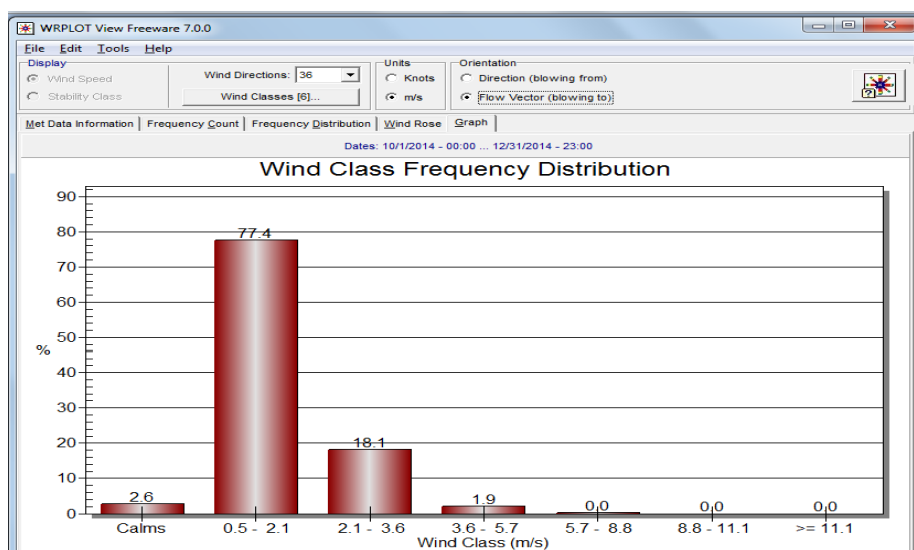


Figure 10:- Wind Class Frequency Distribution.

3.10 AMBIENT AIR QUALITY

The ambient air quality has been monitored with respect to the study area of 10 Km radius from the proposed mine lease boundary. The major sources of air pollution are dust which is generated from unpaved roads, traffic due to vehicles, activities due to agriculture etc. The prime objective of baseline air quality monitoring is to assess existing air quality of the area.

3.10.1 Selection of Sampling Station

The baseline status of the ambient air quality has been assessed through scientifically designed Ambient Air Quality Network. The design of monitoring network in the air quality surveillance program has been based on the following considerations:

- a) Representation of Mine leases area.
- b) Representation of the down wind direction and cross-sectional distribution.
- c) Representation of residential areas.
- d) Representation of regional background levels.
- e) Representation of sensitive receptor.
- f) Meteorological conditions (predominant wind direction and wind speed).
- g) Topography of the study area.

Keeping in view above mentioned points, 06 nos. of Ambient Air Quality Monitoring Stations were established with in the study area.

It can be seen from the wind rose graph, that the wind heading amid the investigation time frame was from WNW. Towns/areas have been chosen downwind way and in addition in the upwind bearing for AAQ checking from the proposed project site.

Table 7:- Ambient Air Quality Monitoring Sampling Stations

Stations	Name	Latitude	Longitude	Distance (km)	Direction	Criteria
A1	Project Site	29°58'43.44"N	77°13'54.71" E	--	--	Project site
A2	Nagla School	29°58'05.53"N	77°14'25.51" E	1.0	ESE	Sensitive receptor near mine site
A3	Barheri	30°00'29.07"N	77°12'56.12" E	2.5	NW	upwind direction of the 1 st

						predominant wind direction and near state highway
A4	Kasimpur	29°56'29.39"N	77°16'07.74" E	5.0	SE	Downwind direction of the 1 st predominant wind direction
A5	Lakhibas	30°02'23.23"N	77°13'38.82" E	5.5	NNW	Crosswind direction of the 1 st predominant wind direction
A6	Rahibas Barsi	29°53'53.13"N	77°13'04.23" E	7.9	S	Vertical direction of mine site

Ambient air quality monitoring was carried out from 06 selected locations within 10 Km study area as per the wind rose and sensitive receptors. The air quality monitoring work has been done in post monsoon period (1st Oct 2017 to 31st Dec 2017).

3.10.2 Sampling and Analytical Techniques and Instruments Used for Sampling

The various instruments used and technique adopted for sampling is given in table below:

Table 8:- Testing Procedure Used for Determining Various Air Quality Parameters

Parameters	Testing Procedure	Limits as per national Ambient Air Quality Standards ($\mu\text{g}/\text{m}^3$) for 24 hours
PM ₁₀	Gravimetric Method by using Repairable particulate matter sampler "Repairable Dust Sampler" (RDS)	100
PM _{2.5}	Cyclonic Method by using Fine particulate sampler.	60
NO ₂	Absorption in diluted NaOH and then estimated calorimetrically with sulphaniamide and N (I-Nepthyle)	80

	Ethylene diamine Dihydrochloride and Hydrogen Peroxide (IS: 5182 1975, Part-VI).	
SO₂	Absorption in Sodium Tetra Chloromercurate followed by Colorimetric estimation using P-Rosaniline hydrochloride and Formaldehyde (IS: 5182 Part – II, 2001).	80

3.11 Impact on Traffic:

Traffic study measurements were performed at State Highway-6 (SH-6) and 3 Major District Road (M.D.R.) to calculate impact on local transport infrastructure due to this mining project.

Table 9:- Roads and Highways in the Study Area

State Highway/District Road	Direction		Dispatched Ratio in Percentage
	Up	Down	
SH-6	Yamunanagar	Ladwa	35 %
MDR-1	Ambehta	Gharoli	35%
MDR-2	Biana	Yamunanagar	20%
MDR-3	Radaur	Yamunanagar	10%
Total Mineral transported through State Highways and MDR			100 %

Activity information gathered constantly for 24 hours by visual perception and tallying of vehicles under three classifications, viz., overwhelming engine vehicles, light engine vehicles and two/three wheelers. As movement densities on the streets are high, two gifted people were sent at the same time at each station amid each move one individual on every one of the two headings for tallying the activity. Toward the finish of every hour, crisp tallying and recording was attempted. Add up to quantities of vehicles every hour under the three classifications were resolved.

Table 10:- No. of Vehicles per Day

Vehicles Distribution	Numbers of vehicles in one day				PC U	Total Number of Vehicle in PCU				Total Number of Vehicle (PCU)/Hour			
	SH-6	MD R-1	MD R-2	MD R-3		SH-6	MD R-1	MDR -2	MD R-3	SH-6	MD R-1	M DR -2	M D R-3
Cars	743	500	400	425	1	743	500	400	425	31	21	17	18
Buses	80	46	48	60	3	240	138	144	180	10	6	6	8
Trucks	693	370	300	300	3	2079	1110	900	900	87	47	38	38
Two wheelers	920	900	780	800	0.5	460	450	390	400	19	19	16	17
wheelers	350	430	350	446	0.75	263	323	263	335	11	13	11	14
Total	2786	2246	1878	2031		3785	2521	2097	2240	158	106	88	95

Table 11:- Existing Traffic Scenario and LOS

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
SH-6	158	1250	0.13	A
MDR-1	106	900	0.12	A
MDR-2	88	900	0.10	A
MDR-3	95	900	0.11	A

V/C	LOS	Performance
0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/ Average/ Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

During Mine Operation (Nagla)

Total Capacity of mine :38,60,000 TPA

No. of working days : 268

Extraction and Transportation of mineral : 14,403 MT/day

Working hours per day : 8 hour

Truck Capacity : 25 Tons

Frequency of trucks/tankers deployed/day (130 x 4 trips/day x 2 up/down) : 1152

Frequency of trucks deployed/hr : 144

Increase in PCU/hr : 432

Total 432 PCU/hr (up & down) will increase on 1 State Highways and 3 Major District Road due to this project activity at a time.

Table 12:- Modified Traffic Scenario and LOS

Road	Increased PCU's- State/National Highway	Volume (V)	Capacity (C)	Modified V/C Ratio	LOS
SH-6	$432 \times 35\% = 151.2$	$158 + 151.2 = 309.2$	1250	0.24	B
MDR-1	$432 \times 35\% = 151.2$	$106 + 151.2 = 257.2$	900	0.285	B
MDR-2	$432 \times 20\% = 86.4$	$88 + 86.4 = 174.4$	900	0.193	A
MDR-3	$432 \times 10\% = 43.2$	$95 + 43.2 = 138.2$	900	0.153	A

3.12 Conclusion

The LOS of SH-6 network will change i.e. from Excellent to very good, for MDR-1 Excellent to very good, for MDR-2 & MDR3 the LOS value doesn't change. The high traffic congestion during Peak hours only; hence, the movement of trucks and dumper will be minimizing in peak hours.

Chapter 4 - Result and Discussion

4.1 Result of Air Monitoring

Air Monitoring was done at the designated location and results are tabulated in the table below for which their graphical representation has also been shown below:

Table 13:- Ambient Air Quality Monitoring Results

Station	PM ₁₀			PM _{2.5}			NO ₂			SO ₂		
	Min	Max	98%tile	Min	Max	98%tile	Min	Max	98%tile	Min	Max	98%tile
A1	70.8	89.8	89.55	31.6	48.8	50.45	14.1	30.2	29.3	7.2	12.6	12.5
A2	73.8	97.3	96.75	35.6	45.6	56.8	16.9	39.3	38.25	6.5	18.2	17.15
A3	72	97.8	97.7	35.2	46.5	56.75	15.5	37.5	36.55	6.8	18.4	17
A4	75.6	97.6	96.4	36.3	46.1	56.65	17.2	37.5	35.95	6.3	16.4	15.95
A5	69.6	95.3	95.25	30.3	49.4	58.4	14.1	36.4	35.75	6.2	14.8	14.1
A6	73.4	97.1	95.8	33.1	46.1	55.35	16.3	31.4	31.3	6.6	13.3	13.25
Limits	100 µg/m³			60 µg/m³			80 µg/m³			80 µg/m³		

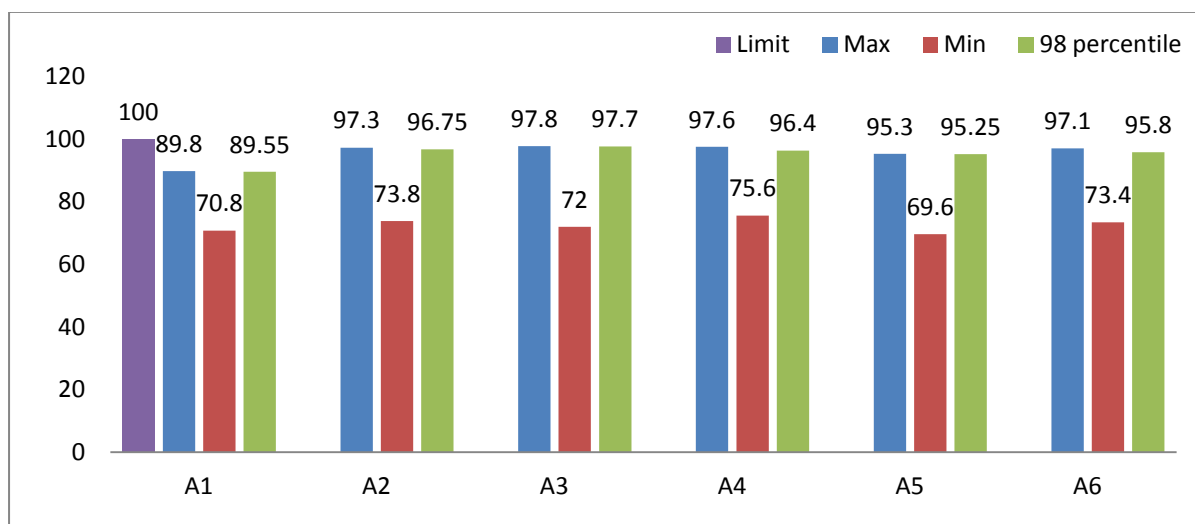


Figure 11:- PM₁₀ Concentration in µg/m³

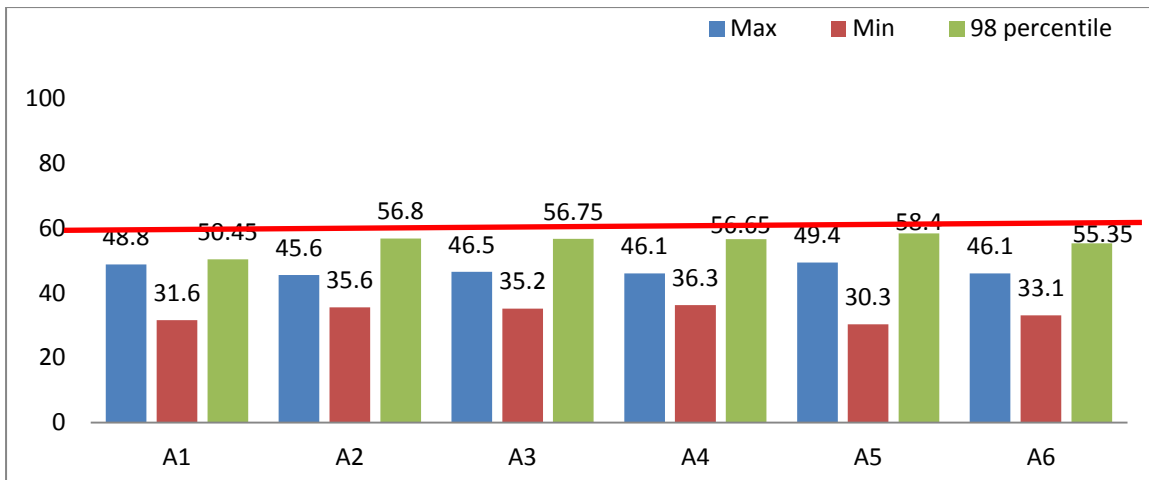


Figure 12:- PM_{2.5} Concentration in µg/m³

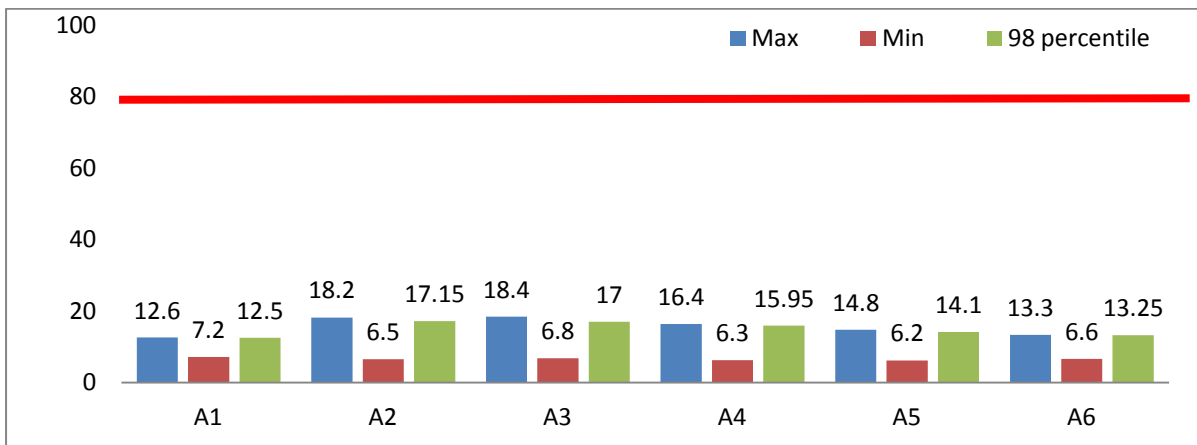


Figure 13:- SO₂ Concentration in µg/m³

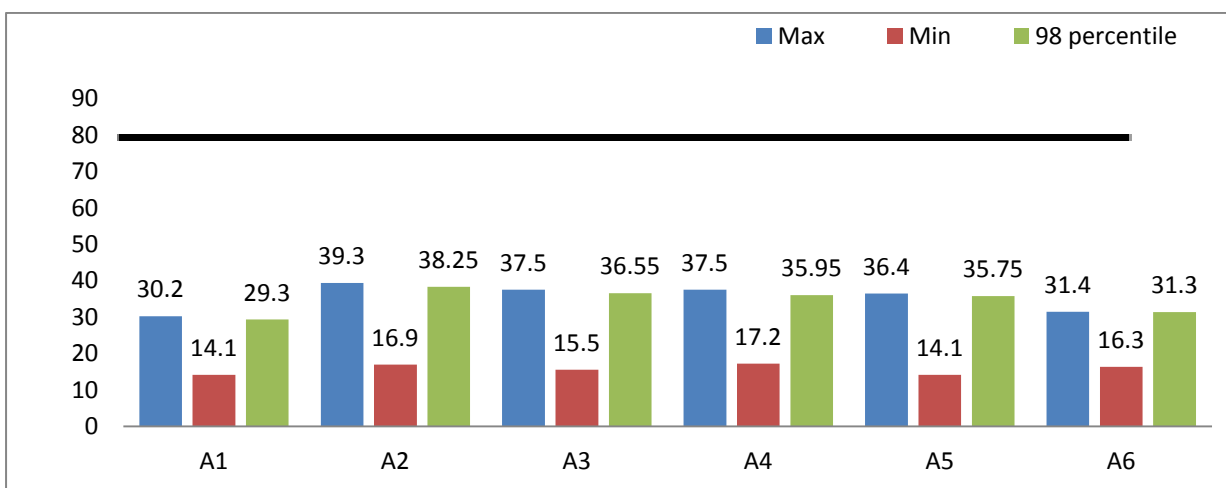


Figure 14:-NO₂ Concentration in µg/m³

4.2 Interpretation of Results of Air

From the graph above of Ambient Air Quality Monitoring measured at six different location, which reveals that the minimum and maximum concentrations of PM₁₀ were found **69.6 µg/ m³ and 97.8 µg/ m³** respectively. The minimum and maximum concentrations of PM_{2.5} were found to be **30.3 µg/ m³ and 49.4 µg/ m³** respectively. The minimum & maximum concentrations of SO₂ for all the 6 AAQM stations were found to be **6.2 µg/ m³ and 18.4 µg/ m³** respectively and minimum and maximum concentrations of NO₂ for all the 6 AAQM stations were found to be **14.1 µg/ m³ AT A-1 and 39.3 µg/ m³** respectively. From the above study and discussions, it can be concluded that air quality of the area is good as the levels are well within the prescribed limits as prescribed by CPCB.

4.3 Anticipated Environmental Impact and its Mitigation Measures (Air)

The environmental parameters likely to be affected by mining are related to many factors, *i.e.* physical, social, economic, agriculture and aesthetic. The excavated sand will be transported via trucks. The operations may disturb environment of the area in various ways, such as removal of mass, change of landscape, surface drainage, and change in air, water and soil quality. Therefore, it is basic to survey the effects of proposed mining movement on various ecological parameters, previously beginning the mining activities, with the goal that reduction measures could be arranged ahead of time for eco-accommodating mining in the territory.

Condition and advancement ought to be considered as commonly reciprocal, reliant, and an instrument of fortifying the personal satisfaction. Natural Impact Assessment (EIA) is the critical part of general ecological administration system and an essential instrument for feasible improvement. It distinguishes significant effects of mining and related exercises on condition and gives rule to set up the important control measure named as Environmental Management Plan (EMP). The effects on various natural parameters because of this mining venture are talked about beneath.

4.3.1 Construction Phase

This is a sand mining project in riverbed. There shall be no impacts as no building stage is envisaged in this project.

4.3.2 Operation Phase

A portion of the effects recognized in different periods of activity are inconsequential and don't warrant much consideration though some others are essential particularly concerning the present setting. In this way objective is to distinguish those effects, which are critical and require a nitty gritty investigation for basic leadership or detailing sufficient administration measures. This area manages an appraisal of effect of different mining exercises on the current natural conditions. The approach of appraisal depends on distinguishing proof and portrayal of the current task exercises and in addition natural parts took after by assessing the effect of mining and related exercises on the earth. The ecological parts that are probably going to be affected or altered by the continuation of undertaking exercises are:

- Air Environment,
- Noise and Vibration Environment,
- Water Environment
- Land use
- Soil Environment
- Hydrology
- Geology
- Biological Environment
- Socio-economic status of the area
- Solid Waste/overburden

4.4 Prediction of Impacts and Mitigation Measures

The major pollutant will be dust which generated from the loading site and from the transportation activity and other like fumes and gases generated by mining machineries during mining operations. The quantitative estimation of such pollutants and their emission rate has been calculated in and inline their mitigations are suggested.

4.5 Air Quality Modeling

ISCST3 Dispersion Model

The Industrial Source Complex (ISC) Short Term model provides options to model emissions from a wide range of sources that might be present at a typical industrial source complex. ISCST3 is US-EPA approved model to predict the air quality. The model uses urban dispersion and regulatory defaults options as per guidelines on air quality models (PROBES/70/1997-1998). Emission sources are categorized into four basic types of sources,

i.e., point sources, volume sources, area sources, and open pit sources. The volume source option and the area source option may also be used to simulate line sources. The model assumes receptors on flat terrain. The ISC short term area source model is based on a numerical integration over the area in the upwind and cross wind directions of Gaussian plume formula. This can be applied to the Point, Area, Line or Volume sources concurrently and their resultant incremental concentration of the pollutant can be predicted.

4.5.1 Model Option Used For Computations

The option used for short-term computations are:

- Stack tip down-wash is not considered;
- Buoyancy Induced Dispersion is used to describe the increase in plume dispersion during the ascension phase;
- Calms processing routine is used by default;
- It is assumed that the pollutants do not undergo any physio-chemical transformation and that there is no pollutant removal by dry deposition;
- Washout by rain is not considered;
- Flat terrain is assumed / used for computations;
- Cartesian co-ordinate system has been used for computations; and
- The model computations have been done for 10 km with 100 m grid interval.

4.5.2 Model Setup

- **Emission of Particulate Matters (PM₁₀ and PM_{2.5})**

The major sources of particulate matter emission in case of sand mining project are the loading activity at mine site (loading of material over trucks/tippers by excavators) and the transportation of sand. The emission rates for these sources are given in latest USEPA's AP-42 guidelines.

- **Loading of Material**

The sand will be loaded on trucks/tippers using excavators. 130 light weight excavators/JCBs will be used for loading total 14403 MT of sand during the working shift of 8 hours/day. The PM₁₀ emission rate due to loading activity is calculated using below equation.

$$E = kX \cdot 0.0016 \cdot X \cdot \left(\frac{U}{2.2}\right)^{1.3} / \left(\frac{M}{2}\right)^{1.4} \quad \text{---} \quad \text{AP42}$$

(Nov2006)

Where,

E = Emission Factor, kg/ton

k = Particle size multiplier, 0.35 for PM₁₀

M = Moisture Content, %

u = Mean wind speed, m/s

4.5.3 Summary of calculated Emission Rates

Table 14: Emissions Rates for PM₁₀ and PM_{2.5}

S. No.	Activities	Units	Emission Rates for PM ₁₀	Emission Rates for PM _{2.5}
1.	Loading of Material	g/s	0.002670	0.000893

4.6 Meteorological Data

The meteorology of the project area plays very important role in dispersion of pollutants and built up of pollution within the atmosphere. In the present study, one season (October–December) meteorological data has been taken to find the dispersion of pollutant concentration. The mixing height for study period, which is an important parameter to express the dispersive potential of atmosphere, has been taken from the atlas of hourly mixing height and assimilative capacity of atmosphere in India.

4.6.1 Modeling Methodology

ISCST3 model was used to predict the GLC of PM₁₀ and PM_{2.5} due to loading activity at mine site.

ISCST3 Model Input Parameters

Point sources resembling loading activity at six locations in mine site were setup in the ISCST3 model. Point receptors resembling baseline monitoring stations and polar grid receptors were setup in 10km radius for prediction of incremental concentrations. The model was run for 8-hour duration during day time using the meteorological data for period October–December. The predicted incremental concentration PM₁₀ was added to baseline concentration to obtain the cumulative concentration level at baseline stations.

4.7 Results of Air Quality Modelling

The predicted maximum incremental concentration of PM₁₀ due to loading activity was found to be 0.6030 µg/m³ (24-hourly average) inside the core zone of mining lease. A section depicting variation in predicted PM₁₀ concentration from upwind to pre-dominant wind direction (*i.e.* from north-west to south-east), the incremental concentration of PM₁₀ drops drastically with short distance due to settling of PM₁₀ particles under gravity. The maximum impact of loading activities will take place in about 500m radius of mining lease boundary. The predicted maximum incremental concentration of PM_{2.5} due to loading activity was found to be 0.2017µg/m³ (24-hourly average) inside the core zone of mining lease.

Table 15:- Predicted GLC of PM₁₀ at Ambient Air Quality Monitoring Stations

Location Code	Location Name	Max Baseline Conc. (µg/m ³)	Predicted GLC (µg/m ³) – Loading	Cumulative GLC (µg/m ³)
A1	Project Site	89.8	0.6030	90.403
A2	Near Nagla School	97.3	0.1682	97.46
A3	Village Barheri	97.8	0.0254	97.8254
A4	Village Kasimpur	97.6	0.0481	97.6481
A5	Village Lakhibas	95.3	0.0219	95.3219
A6	Village RahibasBarsi	97.1	0.0248	97.1248

Table 16:- Predicted GLC of PM_{2.5} at Ambient Air Quality Monitoring Stations

Location Code	Location Name	Max Baseline Conc. (µg/m ³)	Predicted GLC (µg/m ³) – Loading	Cumulative GLC (µg/m ³)
A1	Project Site	50.6	0.2017	50.8017
A2	Near Nagla School	57.4	0.0563	57.4563
A3	Village Barheri	57.2	0.0085	57.2085
A4	Village Kasimpur	57.2	0.0161	57.2161
A5	Village Lakhibas	58.6	0.0073	58.6073

Location Code	Location Name	Max Baseline Conc. ($\mu\text{g}/\text{m}^3$)	Predicted GLC ($\mu\text{g}/\text{m}^3$) – Loading	Cumulative GLC ($\mu\text{g}/\text{m}^3$)
A6	Village RahibasBarsi	56.2	0.0083	56.2083

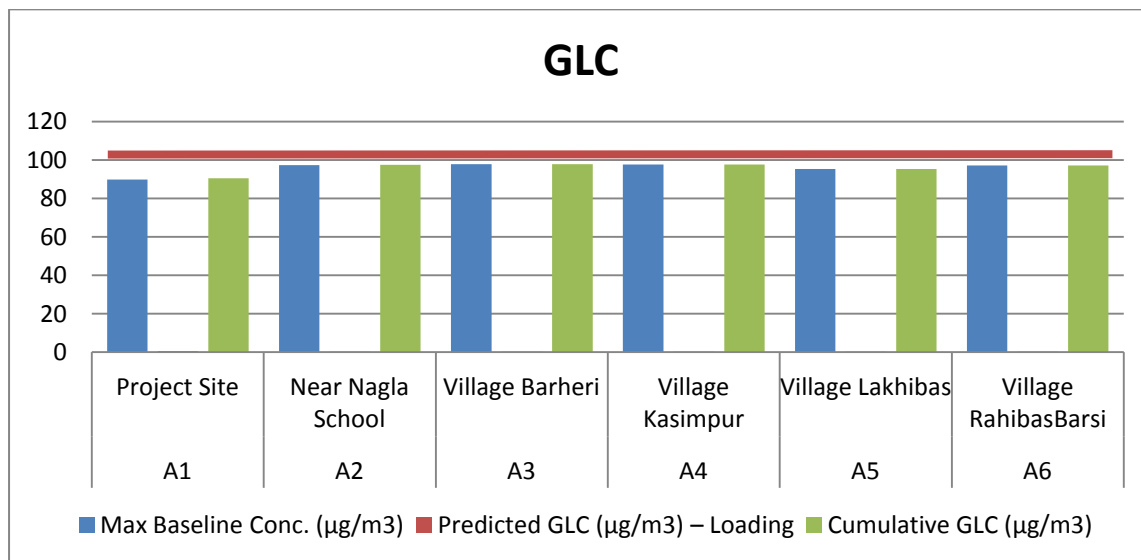


Figure 15:– Graphical representation of PM₁₀ Results

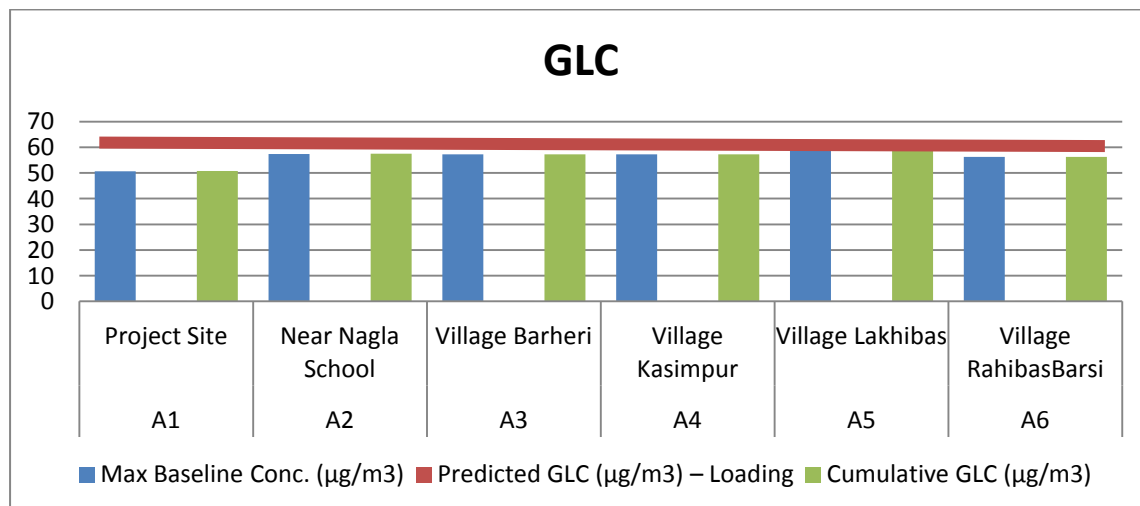


Figure 16:– Graphical representation of PM_{2.5} Results

PROJECT TITLE:
Nagla Sand Mining

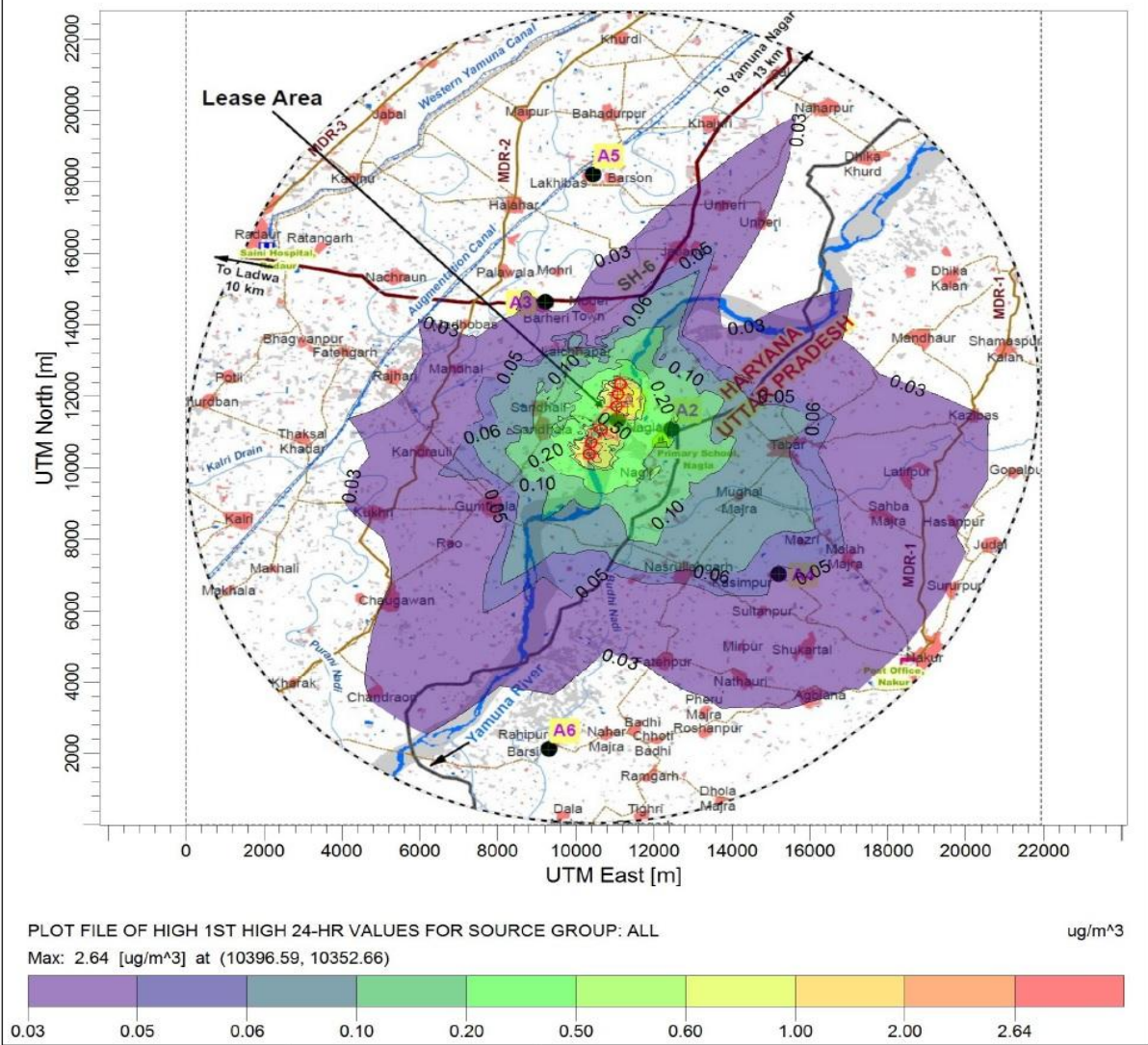


Figure 17:– Spatial distribution of predicted GLCs of PM₁₀ (ISCST3)

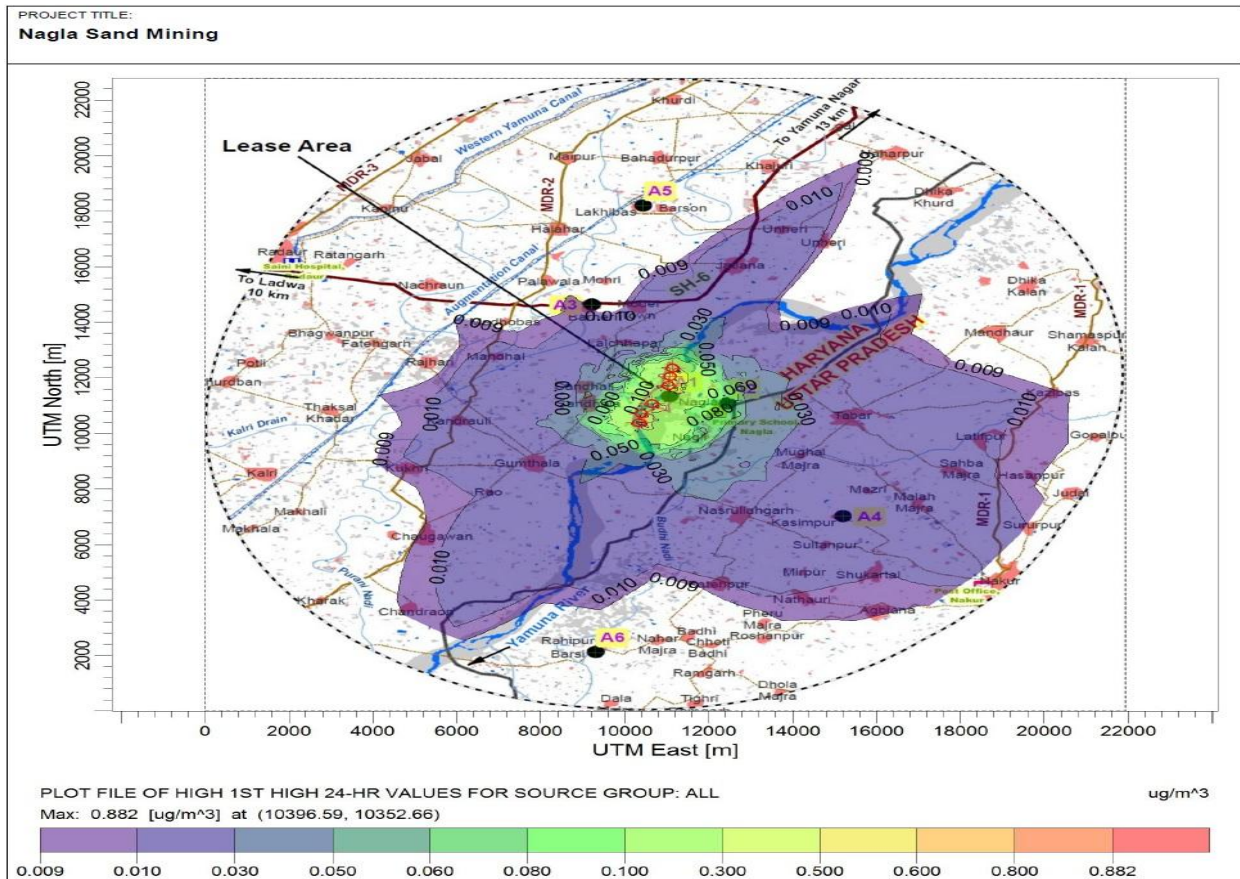


Figure 18: – Spatial distribution of predicted GLCs of PM_{2.5} (ISCST3)

4.8 Conclusion of Air Quality Modeling

- The predicted concentrations from mining activities are under the prescribed limits.
- The predicted GLC i.e. Ground Level Concentration is higher at A1 (Project Site) and A2 (1200m from Mine Site) for both PM₁₀ and PM_{2.5}
- The concentrations of CO, SO₂ and NO₂ generated from mining area are expected to be low due to absence of any major source.
- The predicted concentrations are due to proposed sand mine only and higher pollutant concentrations may be observed in the study area due to simultaneous operations of other mines / anthropogenic activities, data for which is not available.

4.9 Mitigation Measures to reduce Impacts on Air

The proposed mining operations are anticipated have low impact on the ambient air quality. The following measures are suggested to mitigate any harmful impacts of pollutants -

- Planning multiple transportation routes in different direction to minimize the dust generation.
- Frequent water sprinkling on unpaved roads ($>2L/m^2$).
- Plantation of trees along haul roads, especially near settlements, to help to reduce the impact of dust on the nearby villages;
- Dust mask for covering the mouth shall be provided to the workers engaged at dust generation points like excavations and loading points;
- Transportation of material shall be carried out during day time only;
- The speed of trucks plying on the haul road should limited to avoid generation of dust;
- Covering of material during transportation on trucks to prevent spillage of sand from the trucks. The trucks shall be covered by tarpaulin. Overloading shall be avoided.

4.10 Water Requirement for Sprinkling:

The water requirement for dust suppression during operation phase of mine and along the haul road has been calculated on the basis of 2 ltr water requires for 1 m² haul road area during heavy transport. As per transportation route the total length of haul road for the entry and exit from mine lease area to mettle road will be around 5.2 Km maximum. Water requirement for dust suppression of 5.2 Km haul road requires ~125.00 KLD (5200 m x 4 m x 2 x 3 Times.) water will be utilized in dust suppression. For the water spraying 4000 ltr. capacity tanker driven by tractor (4 nos.) will be deployed. In worst case condition on any specific haul road the watering intensity will be diverted from the low pressure haul road.

The water requirement for plantation as per statutory norms total 33% area will be cover by plantation which is 29.52 ha. As for as the proposed project total area 89.48 ha has been allotted under riverbed in such condition there is no plantation will be done in riverbed so plantation will be done both the side of river (pollution prone side) and haul road. 4L water will be use for each plant so ~33.00 KLD water will be used for irrigation in plantation.

Impacts of Air Pollution and Mitigation Measures

Table 17:- Scenario due to PM₁₀

Attributes	Impact	Mitigation Measure
Human	A predicted cumulative GLC of PM ₁₀ was 97.8254 µg/m ³ against the threshold limit of 100 µg/m ³ which can cause adverse effect on human health.	<p>125.00 KLD water will be proposed for dust suppression at mine site and haul road (Motorable Connecting road) by sprinklers to avoid dust generation during mining activity and transportation.</p> <p>Personal Protective Equipments (PPE) like Eye Goggles, Dust Mask, Leather gloves, safety Shoes & Boots will be provided to the workers engaged at dust generation points like excavation and loading points.</p> <p>Planning transportation routes of sand so as to reach the nearest paved roads by shortest route (minimize transportation over unpaved road). Alternatively, new haul road will be constructed by Project Proponent for transportation of excavated minerals from mine to nearest approach road.</p>

Table 18:- Scenario due to PM_{2.5}

Impact	Mitigation Measure
A predicted cumulative GLC of PM _{2.5} was 58.6073 µg/m ³ at proposed Mine site under the threshold limit of 60 µg/m ³ which can cause adverse effect on human health.	<p>125.00 KLD water will be proposed for dust suppression at mine site and haul road (Motorable Connecting road) by sprinklers to avoid dust generation during mining activity and transportation.</p> <p>Personal Protective Equipments like Eye Goggles, Dust Mask, Leather gloves, safety Shoes & Boots will be provided to the workers</p>

	engaged at dust generation points like excavation and loading points.
--	---

4.11 Conclusion of Impacts on Air

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

Impact of dust within 500m near to mine site and motorable haul road will be on standing crops and will reduce the productivity. There is the provision to provide compensation to farmers for their loss as per mutual understanding and government rules. The probable budget for the compensation of such loss will be expedited through the proponent. Separate budget provision will be made for such compensation.

4.12 Traffic Environment

Impact	Mitigation Measure
No. of 432 PCU/hr will increase due to mining in existing traffic scenario lead to air pollution which can cause adverse effect on human health of neighboring villagers like effect on breathing and respiratory system, damage to lung tissue, cancer and premature death, influenza or asthma.	Vehicles with PUC Certificate will be hired. Regular maintenance of vehicles will be done to ensure smooth running of vehicle. It is proposed to plant 8307 no/year of local species with consultation of local administration and Forest department along the haul roads, outer periphery of the lease area to prevent the impact of dust in the nearby village. Regular Health checkup camps will be organized.

No. of 432 PCU/Hr will increase in the existing traffic due to this mining activity hence vehicle collision may occur unwanted sound and can also cause impact on human health.	In addition, truck drivers will be instructed to make minimum use of horns in the village area and sensitive zones. The lease holder proposed to plant 45000 sapling in the plan period. The trucks will be diverted on four roads viz SH-6 and 3 district road to avoid traffic congestion. Regular Health checkup camps will be organized.
Accidents may be occurring due to fast movement of vehicles.	To avoid accidents the speed of vehicles will be low near habitation areas.

Table 19:- Traffic Density Impact on Haul Roads (Motorable Connection Roads)

S. No.	Road Name	Road Length (Km)	Road Connectivity		Total Number of Dumpers / Day (8Hrs.)	Total Trips (Up/ Down)	Total Volume of Mineral Transported (MT)
			From	To			
1.	Haul Road 1	3.10	Mine Site	Model town Village	190	380	4750
2.	Haul Road 2	1.00	Mine Site	Sandhali Village	196	392	4900
3.	Haul Road 3	1.10	Mine Site	Sandhala Village	190	380	4750
Total		5.20	--	--	576	1152	14400

Total Production Capacity	=	38,60,000 TPA
Production/ day	=	14,403 MT/ Day
Dumper Capacity	=	25 MT
Total No. of Haul Roads (Motorable Connecting Roads)	=	3

Total Dumper required (130 truck as per mine plan x 4.4 trips) = 576
Dumpers

In this mining project there are 3 haul roads originating from mine site and connecting to MDR (all are metalled). The details of haul roads with the length and transportation of dumpers (trips)/MT/Day are mentioned in the above table.

These haul roads will be constructed by the lease holders from their own expenses and he will pay the due compensation to the land owners for using assess for transportation of minerals as per **Rule 62 & 63 of Haryana Mineral Concession Rules, 2012**. It is also clarified that these haul roads will be exclusively used for the minerals loaded dumpers of this lease area only to transport the mineral, **Hence the impact of traffic density on these haul/ motorable roads will be quite negligible.**

4.13 Budget

A budget of INR 49.95 Lakhs per year i.e. 10% of the annual contract money will also be deposited in “**Restoration & Rehabilitation Fund**” by the lease holder in the mining department for protection of environment of nearby area and maintenance as well as repair of roads.

4.14 Mitigation Measures to reduce Impact due to Traffic

1. These motorable roads will be regularly repaired and maintained on their own expenses and also to control the air and noise pollution.
2. In peak hours of traffic the transportation of dumpers will be suspended.
3. Speed of dumpers will be limited to 20km/hr on these haul roads.
4. Dumpers will be transported during day time only.

Hence the impacts are being analyzed and its anticipated mitigation measures were suggested in this chapter.

Similarly, other parameters and various impacts were also analyzed in the preparation of draft Environmental Impact Assessment Report. Once this draft EIA report is completed, then this draft EIA report was submitted in the State Pollution Control Board for the process of Public Consultation. Hence Public Hearing was conducted at the mine site. There, project affected people were gather to discuss about the project, their queries and objections were answered by the project proponent and the consultant. The Minutes of public hearing are compiled in

the Final EIA and then this Final EIA was submitted on the online portal of MOEF&CC for the appraisal of the Project.

Chapter -5 Conclusions

So far it has been seen that mining impact affects natural, social, organic and financial elements of the prompt regions. In spite of the fact that mining exercises would get financial advancement the general public yet then again mining do cause some potential effects, for example, arrive corruption, air contamination, water contamination and so on. Mining in the riverbed antagonistically influences the amphibian eco-arrangement of the stream. Consequently it is imperative to do the effect evaluation concentrates to learn and measures the potential unfavorable effects of mining. In the arrangement of this report, it has been cleared that expectation of effects ought to be done at the arranging stage just with the goal that its preventive and restorative measures would be taken viably and before time in order to limit the effects. It has been evident that mining will be done just in zones where mineral exists thus this action is a site particular action.

Specifically, the procedure deals with the down to business strategies for tending to total impacts inside the general EIA framework. Two issues have been given exceptional thought all the while — checking and examination of impacts. Examination of air quality impact for opencast mining wanders, it has been battled, should be done through the most ideal usage of models, for instance, ISCST3. The aggregate impact assessment has been made an essential bit of EIA definitive requirements in various nations over the world. Nevertheless, in India, this need has still not been combined in the EIA alerts of the Ministry of Environment and Forests. As the examination reveals, countless obstructing environmental impacts may occur by not honestly keeping an eye on the capacity of aggregate impacts. It is recommended that in future joined impacts should be fused into the EIA technique in India as it prompts best practice, enhances the sufficiency of EIA by aiding in the fundamental authority process, and finally adds to sensible headway.

The two main types of mining techniques are Opencast Mining and Underground Mining. Minerals are classified as Major Minerals and Minor Minerals. The project undertaken in this report is on mining of sand which is again a Minor Mineral. The Mining is done by Opencast Semi- Mechanised method. As this is a sand mining project there would not be any use of heavy machineries as no drilling and blasting is required for the excavation of Sand.

The allotted project on Environmental Impact Assessment of Mining of Sand in Village Nagla Rangran of Yamuna Nagar District. This project gave me the opportunity to learn the various processes that involved in the making of EIA report.

Main finding while doing this project are

1. Learned about the type of project, its location and to mark that location in the form of a kml file.
2. Components of investigation and evaluation targets were taken into consideration.
3. Worked on identifying the preliminary impacts and scoping of EIA.
4. Preparation of Windrose and collection of meteorology data for analysing the baseline information.
5. Involved in each and every process of this project.
6. Prediction and assessment of the impacts were done.
7. Incorporated all the possible mitigation measures with the allocation of required budget.

The investigation uncovers that Sand is removed on account of its significance as an asset and has numerous utilizations that incorporate building frameworks, putting and making establishments. Thus, the request and supply of the mineral remain a ceaseless procedure, subsequently captivating a huge bit of individuals taking part in this action. Mineral uncovering is critical in the monetary advancement of these individuals. Be that as it may, removal of sand accompanies few weaknesses moreover. Its effect on air, water, noise, and soil are immediate. With the expansion of urbanization and expanding populace, more framework improvement is seeing that require a huge measure of building materials. Accordingly, more removal of minerals is being finished. These practices are should be controlled on time with appropriate arranging, thus some moderation measures were additionally proposed to limit the effect of this mining movement. A portion of the measures taken to stay away from the age of clean are:-

- Planning numerous transportation courses in various ways in order to limit the effect.
- Trucks ought to be cover with canvas to stay away from clean age amid their development.
- The speed of the truck conveying the mineral ought to stay in the breaking points.

- Mine specialists would be furnished with appropriate veils to cover their countenances.
- Plantation on both sides of the pull streets which help in lessening the effect on the adjacent by towns.

Thought of contrasting options to project proposition is a necessity of EIA process. Amid the checking procedure, other options to a proposition can be considered or refined, either specifically or by reference to the key issues distinguished. A correlation of options helps to decide the best strategy for accomplishing the task goals with least ecological effects or demonstrates the most earth benevolent and savvy alternatives.

- During monsoon season, when waterways achieve high stage, Yamuna River additionally bears critical catchment territory and it transports streambed material (sand) which gets aggregated at such stretch which augments waterway width and curved banks.
- Sand (minor mineral) stores are site particular. It is available in Yamuna stream bed (89.48 Ha.). The mining of the material will be finished by opencast semi-automated technique in riverbed. The mining will be done according to set down methodology Haryana Minor Mineral Concession, Stocking, Transportation of Minerals and Prevention of Illegal Mining Rules, 2012. The mined out region in stream bed piece will get recharged every year after the monsoon period. Thusly, no alternative site is recommended as existing area utilization of mine rent delegated "Stream Body" and will keep on being so even after the present mining venture is over subsequently no substitute site is proposed for this project.

Mining significantly affects the financial, social and natural texture of bordering regions. In spite of the fact that mining exercises realize monetary advancement in the zone in the meantime the land debasement it causes makes natural and financial issues. Mining unfavourably influences the eco-framework as an entirety. It is vital to direct reasonable evaluation concentrates to take in the potential unfavourable effect of mining or then again verdure. The unfriendly effect ought to be distinguished at the arranging stage itself with the goal that restorative measures might be taken ahead of time.

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