



Draft EIA/EMP Report for Existing Veeranam Black Granite Quarry, situated in Veeranam Village, Thandarampattu Taluk, Thiruvannamalai District, Tamil Nadu State Over an extent of 20.50 Ha at SF No. 74(P),126/1A, 127,132(P),144/1&2 & 145/2

## **“EXECUTIVE SUMMARY”**

**OF**

### **ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

**FOR**

**Veeranam Black Granite Quarry**

**IN**

**Veeranam Village, Thandarampattu Taluk, Thiruvannamalai District,**

**Tamil Nadu State**

**Extent - 20.50.0 Ha at SF No. 74(P),126/1A, 127,132(P),144/1&2 & 145/2**

**Proposed production - 1,05,168 M<sup>3</sup> (ROM) Black Granite**

**PROJECT COST - 100Lakhs**

**CATEGORY- 'B'**

**STUDY PERIOD-1<sup>st</sup>MARCH TO 31<sup>st</sup>MAY, 2018**

### **Applicant**

**M/s Tamil Nadu Minerals Limited  
(An undertaking of Govt. of Tamil Nadu)**

**31, Kamarajar Salai, P.B.No.2961, Chepauk, Chennai - 600 005, Tamil Nadu**

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### **Prepared By**



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**NABET Certificate No: NABET/EIA/1720/RA0080 Valid Till 19/04/2020**

**NABL Accredited & Recognized MOEFCC, New Delhi.**

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## **1. GENERAL**

M/s. Tamil Nadu Minerals Limited (An Undertaking of Government of Tamil Nadu) was established in the year 1978 to carryout systematic mining and development of different minerals all over the state. Ever since its inception TAMIN has developed expertise in the mining of granite dimensional stones of different varieties including black granite (Dolerite), Kashmir White (Leptynite), Paradiso (Migmatite gneiss), Green Onyx (Syenite - porphyry) Red wave (Pink Feldspathic gneiss) Colombo Juparana (Pegmatitic granite gneiss of migmatic origin), Raw silk (Yellow feldspathic Leptnite) and a number of other coloured granite varieties apart from other industrial minerals viz., quartz and feldspar, graphite, limestone, silica sand, vermiculite, etc.

TAMIN has also set up industrial units for processing the granite stones one each at Manali, at Chennai, Madhepalli at Krishnagiri District and Melur at Madurai District. A Beneficiation plant for the beneficiation of graphite ore has been established close to Sivaganga Graphite Mine. An exfoliation plant for the processing of vermiculite mineral at Sevathur, Vellore District has also been established. Further, TAMIN is the only organization recognized by Bureau of India Standard for manufacture and supply of I.S. Sand all over the country.

### **1.1 PROJECT IDENTIFICATION**

M/s. Tamil Nadu Minerals Limited had been granted a Lease to quarry Black Granite, in Survey Field No (SF No) 74/1(Part), 126/1A, 127, 132(part), 144/1, 144/2, and 145/2(part), over an extent of 20.50.00 Ha. situated in Veeranam village in Thandarampattu Taluk of Tiruvannamalai District. The proposed production capacity is 1,05,168 m<sup>3</sup>(ROM of Black Granite).

The original Lease for this Black Granite quarry was granted on 09/12/1985 for the period of 20 years, over an extent of 84.79 Ha, vide GO Ms No 229, Industries, Dt 23.02.1982. The lease expired on 20.05.2004. The project proponent had applied for renewal of lease over an extent of 24.67.00 Ha, out of the original area of 84.79.00 Ha. The district authorities had reduced the renewal area from 24.67.00 Ha to 20.50.00 Ha, as it was found that 4.25.00 Ha was devoid of Black Granite Deposit. Hence the lease extent for Quarrying Black Granite in the said SF Nos 74/1(Part), 126/1A, 127, 132(part), 144/1, 144/2, and 145/2(part), in Veeranam Village, Thandarampattu Taluk, Thiruvannamalai District, was reduced to 20.50.00



Ha, and lease granted for a period of 20 years, vide G.O MS No 28, Industries (MME.I) Department, dated 24.05.2004.

The Mining Plan for the existing Black Granite in S. F. No. 74/1(Part), 126/1A, 127, 132(Part), 144/1&2 and 145/2, Veeranam Village, Thadarampattu Taluk, Thiruvannamalai District, Tamil Nadu State was approved by the Commissioner of Geology and Mining, Chennai vide letter No 12926/MM2/2001 dated: 05.05.2004.

Subsequently, the scheme of Mining-1 pertaining to the years from 2009-10 to 2013-14, was approved by the Commissioner of Geology & Mining, Chennai-32 vide Lr. No. 5591/MM5/2009, dated 07.01.2010. The Scheme of Mining II pertaining to the years 2014-15 to 2018-19 was submitted vide TAMIN office Lr. No. 17519/ML3/2013, dated 02.01.2014 and it is under the active consideration of the DGM, for approval.

The quarry was worked during the first four years of Scheme of Mining-II period from 2014-15 to 2018-19 under deemed approval vide rule 18 of GCDR, 1999. During the above said period of working, the demand for this material had increased in the granite industries. Hence, TAMIN proposed to increase the production from 720 M<sup>3</sup> to 2100 M<sup>3</sup> (saleable) per annum, in order to cater to the increased market demand.

TAMIN had submitted the Modified SOM-II, for the period from 2014-15 to 2018-19, for the production quantity of 2100 m<sup>3</sup> per annum for one year (2018-2019) vide this office letter No 17519/ML-3/2013, dated 27.06.2017 and it has been recommended and forwarded to the DGM, for approval. By taking into consideration the deemed approval under Rule 18 (5) of GCDR, 1999, the Scheme of Mining -III for the period from 2019-20 to 2023-24, has been submitted by TAMIN, vide letter No 17519/ML3/2013 dated 17.12.2018. The same has been forwarded to the DGM for approval.



## 1.2 IDENTIFICATION OF PROJECT PROPONENT

Applicant
<b>TAMIL NADU MINERALS LIMITED</b> (An Undertaking of Government of Tamil Nadu) 31, Kamarajar Salai, P.B.No.2961, Chepauk, Chennai- 600005, Tamil Nadu State Phone No.+91 44 28410382, 28511972 Fax Number +91 44 28524960 E-mail : tamin@tamingranites.com

### A. SALIENT FEATURES OF THE PROJECT

TABLE: 1.1 PROJECT PROFILE & SALIENT ASPECTS		
1	Name of the project	Veeranam Black Granite Mine of M/s. Tamil Nadu Minerals Ltd., (TAMIN)
2	Extent & type of land	Extent of 20.50.0 ha of Non Forest Government poromboke land leased to TAMIN.
3	Capacity	Proposed production capacity of 1,05,168 m <sup>3</sup> (ROM) Black Granite
4	Village	Veeranam
5	Taluk	Thandarampattu
6	District	Thiruvannamalai
7	State	Tamil Nadu
8	Latitude	12°11'11.85"N to12°11'40.41"N
9	Longitude	78°53'46.95" E to78°54'38.33"E
10	Toposheet No.	57 L/15, 57L/16
11	Surface elevation	The highest elevation of the lease area is 130m RL and lowest elevation is 100m RL.
12	Temperature(Maximum)	40.7°C
13	Rainfall (Average)	1033 mm



## B. ENVIRONMENTAL SETTINGS

S.No	Description	Particulars	Distance & directions		
1	Nearest Village	Veeranam	526 meter in NE direction		
2	Nearest Town	Thandarampattu	6.26 Km SE		
3	Nearest Highway	NH66 SH6A SH6B	8.790km in NNE direction 4.0 Km in SE direction 0.8 km in NE direction.		
4	Nearest Railway station	Thiruvannamalai	16.76 Km N Direction		
5	Nearest Airport	Chennai	163.84 Km In NW direction		
6	Reserved and Protected Forests	<b>Reserved &amp; Protected forest</b>			
		<b>Sl. No.</b>	<b>Name of location</b>	<b>Distance</b>	<b>Direction</b>
		1)	Pinjur RF (1)	7.80km	NW
		2)	Pinjur RF (2)	8.67 km	NW
		3)	Eraiuramali RF	8.80 km	N
		4)	Uchchimalai (1) RF	6.0 km	N
		5)	Uchchimalai (2) RF	4.0 km	NE
		6)	Radapuram RF	5.18 km	ENE
7)	Ponnaiyar RF	Near lease boundary			
7	Hills / valleys	Nil within the study area			
8	Notified Archaeologically important places, Monuments	None within the study area.			
9	Local Places of Historical and Tourism Interest	None within the study area.			
10	Environmental sensitive areas, Protected areas as per Wildlife	Sathanur Dam Crocodile Farm – 5.5 Km, SW			



	Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)																																													
11	Defence Installations	Nil within 10km radius																																												
12	Seismic Zone	Seismic Zone -II																																												
13	Other Industries in the study area	Nil																																												
14	Nearest major water bodies	<table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Name of location</th> <th>Distance</th> <th>Direction</th> </tr> </thead> <tbody> <tr> <td>1)</td> <td>Ponnaiyar River</td> <td>5.33 Km</td> <td>SW</td> </tr> <tr> <td>2)</td> <td>Pomban Ar</td> <td>8.15Km</td> <td>SW</td> </tr> <tr> <td>3)</td> <td>Alai Nala</td> <td>6.64 Km</td> <td>SE</td> </tr> <tr> <td>4)</td> <td>Sathanur Reservoirs</td> <td>3.61Km</td> <td>W</td> </tr> <tr> <td>5)</td> <td>Canal (N/v-Karippur)</td> <td>4.74Km</td> <td>N</td> </tr> <tr> <td>6)</td> <td>Sattanur main canal</td> <td>5.31Km</td> <td>S</td> </tr> <tr> <td>7)</td> <td>Pond (N/v-Vinavanur)</td> <td>7.89Km</td> <td>SSE</td> </tr> <tr> <td>8)</td> <td>Pond (N/v-karippur)</td> <td>4.73Km</td> <td>N</td> </tr> <tr> <td>9)</td> <td>Pond (N/v-Kilvanakkambadi)</td> <td>4.72 Km</td> <td>E</td> </tr> <tr> <td>10)</td> <td>Pond (N/v-Radapuram)</td> <td>6.34 Km</td> <td>EES</td> </tr> </tbody> </table>	Sl. No.	Name of location	Distance	Direction	1)	Ponnaiyar River	5.33 Km	SW	2)	Pomban Ar	8.15Km	SW	3)	Alai Nala	6.64 Km	SE	4)	Sathanur Reservoirs	3.61Km	W	5)	Canal (N/v-Karippur)	4.74Km	N	6)	Sattanur main canal	5.31Km	S	7)	Pond (N/v-Vinavanur)	7.89Km	SSE	8)	Pond (N/v-karippur)	4.73Km	N	9)	Pond (N/v-Kilvanakkambadi)	4.72 Km	E	10)	Pond (N/v-Radapuram)	6.34 Km	EES
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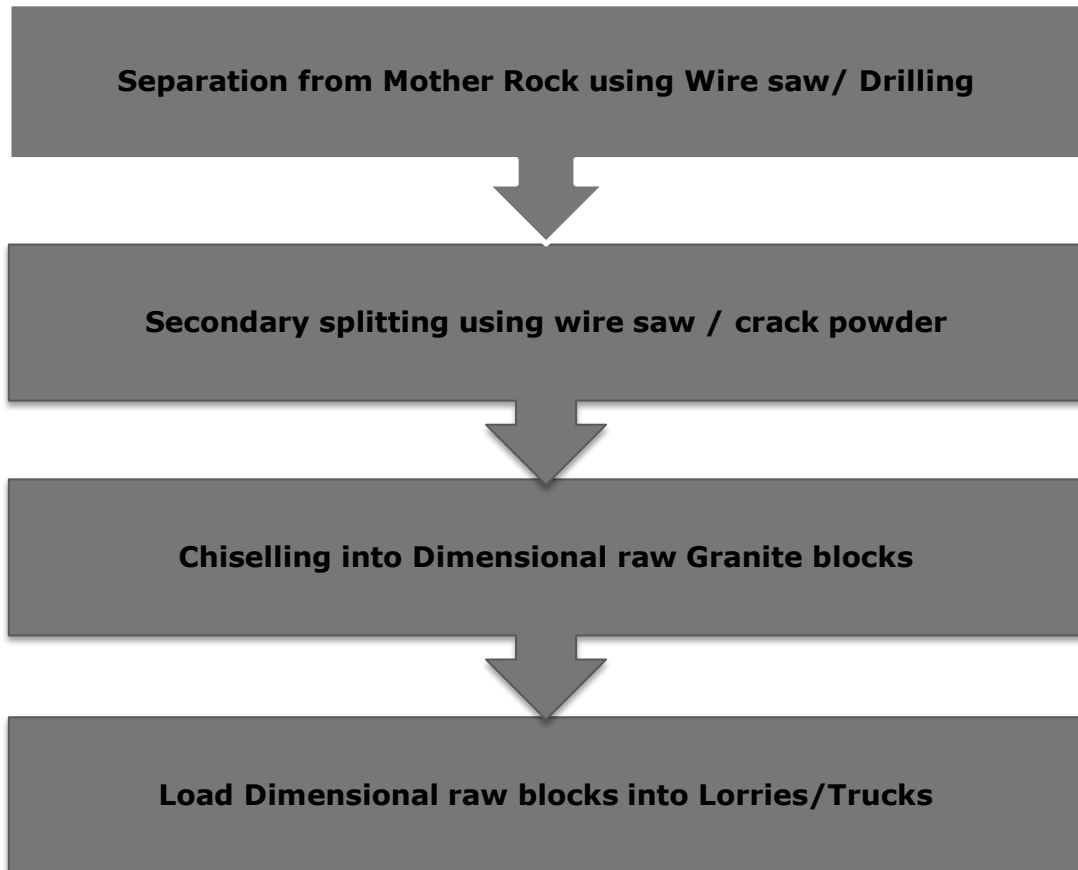


## 2. BRIEF PROJECT DESCRIPTION

1	Geological Reserves (as on 12.12.2018)	14,49,085 m <sup>3</sup>		
2	Mineable reserves (as on 12.12.2018)	8,05,760 m <sup>3</sup>		
3	Total waste removal	About 5,98,978Cum SB/OB/Granite reject will be generated during scheme of mining period.		
4	Method of Mining	Open cast Semi Mechanized method		
5	Name of machinery	1. Hydraulic Excavator(capacity 35 MT>) - 1no. 2. Compressor Portable - 2nos 3. Mining Tipper - 2Nos 4. Jack Hammer - 6Nos 5. Diamond Wire cutting machine with Gen set. - 1No. 6. Oil Engine 5HP - 2Nos. 7. Crane 16- Ton Inditial Crane - 1No.		
6	Bench height	6m		
7	Maximum Quarry depth	30 m from top of Hill		
8	Mode of transport	Granite will be transported in Lorries.		
9	Water requirement	<b>WATER REQUIREMENT</b>		
		<b>Sl. No.</b>	<b>Particulars</b>	<b>Quantity KLD</b>
		<b>1</b>	Drinking and Domestic use	0.5
		<b>2</b>	Dust Suppression	0.6
		<b>3</b>	Green Belt/Plantation	0.4
Total		1.5		
10	Source of water	Water required for the mine will be met from vendors; Stored water in the mine pit		
11	Life of Mine	7 years		



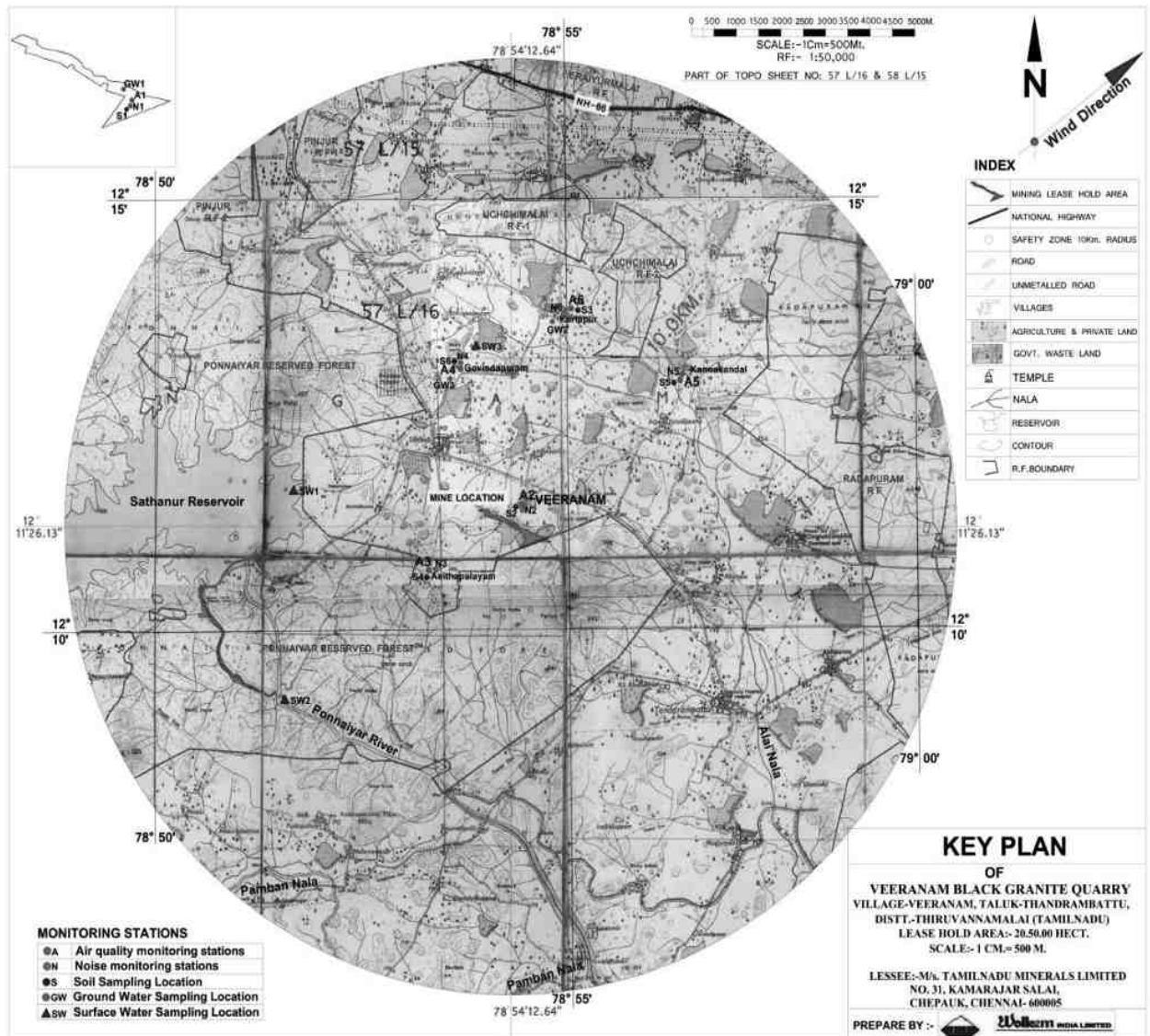
## 2.1 Mining methodology: Open Cast Semi Mechanized Method



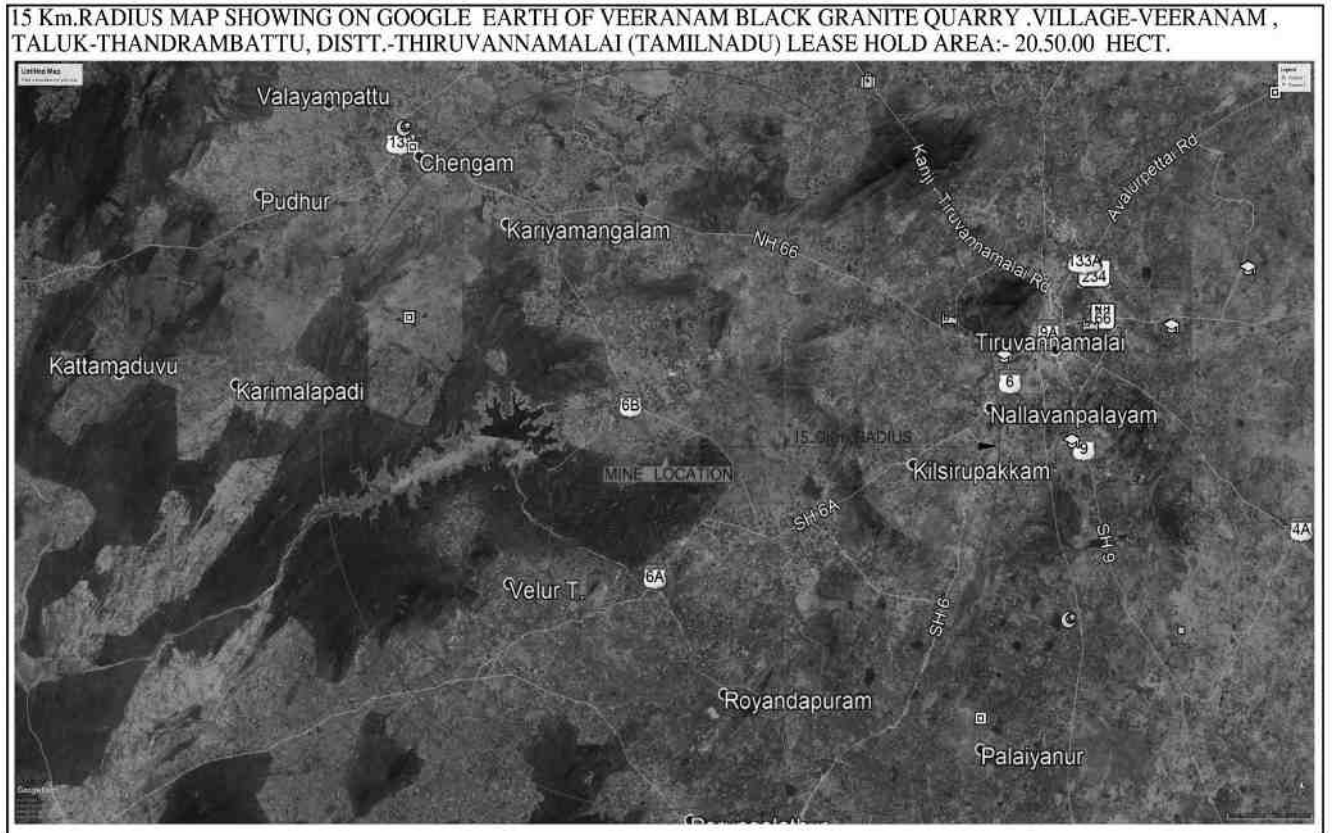




**FIGURE 2.1: KEY PLAN OF THE LEASE AREA**



**FIGURE 2.2: GOOGLE IMAGE SHOWING 15KM RADIUS OF PROJECT BOUNDARY AND PROJECT BOUNDARY**





### **3.0 EXISTING ENVIRONMENT SCENARIO :**

#### **3.1 GENERAL :**

The baseline environmental monitoring was carried out during pre-monsoon season of year March 2018 to May 2018. The study was conducted in the study area systematically and scientifically and as per relevant IS codes, CPCB, MoEF & CC guide lines and as per approved ToR. The various environmental components which are thoroughly studied during the study period include:

- ❖ Socio- Economic Environment
- ❖ Water Environment
- ❖ Noise Environment
- ❖ Land Environment
- ❖ Biological Environment
- ❖ Air Environment

The project Influence area has been divided into two zones, namely, core and buffer zones for the purposes of this study.

#### **3.2 SOCIO ECONOMIC ENVIRONMENT-**

##### **3.2.1 Core Zone:**

The Core zone covers 20.50.0 Ha of the Mine lease area. The entire Mine Lease area is classified as non-forest government poromboke land and is leased to TAMIN.

##### **3.2.2 Buffer Zone:**

The buffer zone encompassing 10 km radius from the periphery of core zone consists mostly of rural villages and urban areas. The primary socio economic data was collected through field survey and structured interviews in sample villages in study area as well as the observations by the survey team. A judgmental and purposive sampling method was used for choosing respondents of various sections of the society i.e. Panchayat representatives, adult males and females, teachers, medical practitioners, businessmen, agriculture laborers, youth etc. Judgmental and purposive sampling method includes the right cases from the total population that helps to fulfil the purpose of research needs. A glimpse of the data for Tiruvannamalai district is given below.



Particulars	0-10 Km
No. of House holds	21025
Male Population	44673
Female Population	44016
Total Population	88689
Male Population(0-6 Years)	5623
Female Population (0-6 Years)	5108
Total Population (0-6 Years)	10731
Average Household Size	4
% Of 0-6 Years to the total Population	12.10
% Of males to the total Population	50.37
% of females to the total Population	49.63
Sex Ratio (no of females per 1000 males)	985

Source: Primary census abstract 2011, Thiruvannamalai District, Tamil Nadu

### Human Settlement

The study area comprises 31 villages with population of about 88689 (Male- 44673 & female – 44016) and number of households are 21025. (According to the Census 2011).

### Population

The total number of house hold is 21025 with an average house hold size of 4 people. Hence, it is interpreted there are less of joint family systems in the study area. There are 88689 people in the study area as per the census survey of India, 2011.

## 3.3 EXISTING AIR QUALITY

One pre-monsoon season March-May 2018, primary data baseline study on ambient air quality (PM<sub>10</sub> , PM<sub>2.5</sub> , SO<sub>2</sub>, NO<sub>2</sub> & CO) water quality, noise level, Soil and Biological data has been collected during the pre-monsoon season and the data wise compilation are given in detail in the EIA/EMP report.

### 3.3.1 AMBIENT AIR QUALITY :

No of AAQ Monitoring locations - ( 1 core zone, 5 buffer zone)		Pre-Monsoon (March to May, 2018)	
Parameter	Core Zone Range of Result (in µg/m <sup>3</sup> )	Buffer Zone Range of Result (in µg/m <sup>3</sup> )	*CPCB Limit (µg/m <sup>3</sup> )
PM <sub>10</sub>	51.39 – 73.35	58.88 – 75.23	100



PM <sub>2.5</sub>	28.68 - 52.06	33.96 - 54.18	60
SO <sub>2</sub>	6.80 to 11.14	5.40 to 10.41	80
NO <sub>2</sub>	19.62 to 29.70	14.86 to 26.73	80
<ul style="list-style-type: none"> <li>CO values in the all locations were found to be below detectable limit mg/m<sup>3</sup>.</li> </ul> *CPCB Limits for Industrial & Residential category (2009 Notification)			

A network of 6 Stations was established to study the ambient air quality. The ambient air quality was studied from March to May 2018 as per CPCB guidelines. From the baseline monitoring result, it is observed that the monitored parameters (PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>& NO<sub>2</sub>, CO) are within the permissible limits as per NAAQS, 2009 during the study period.

### 3.4 WATER ENVIRONMENT :

There is no ground water & surface water source exist in mining lease area. The assessment of present status of water quality within the study area was conducted by collecting water from ground water sources during the period of March 2018 to May' 2018.

No of Samples - 1 mine GW +3GW	Pre-Monsoon (March to May, 2018)	
Physical/Chemical Parameter	Water Samples	*IS 10500:2012 Permissible Limits
pH	7.52 - 8.3	6.5 - 8.5
Total Dissolved Solids, mg/l	172 - 546	2000
Chloride (as Cl), mg/l	22-82	1000
Total Hardness (as CaCO <sub>3</sub> ), mg/l	108 - 216	600
Total Alkalinity (as CaCO <sub>3</sub> ), mg/l	96 - 196	600
Sulphate, mg/L	20.2 - 79.6	400
Iron (as Fe), mg/l	BDL (<0.1) -0.13	0.3
Fluoride, mg/L	0.2-0.3	1.5
Nitrate as NO <sub>3</sub> , mg/l	4.16-16.6	45
<b>*IS 10500:2012 - Permissible limits in the absence of alternate source</b>		

The water quality of ground water is found to be within the prescribed permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications.



## METEOROLOGY

During pre-monsoon season March-May 2018 recorded Maximum temp. 40.7°C and minimum temperature was 18.2 °C. Predominant wind direction during the study period SW to NE.

### 3.5 NOISE ENVIRONMENT-

No of locations - 6 ( 1 core zone, 5 buffer zone)		Summer Season 2016 (March to May, 2016)		
Noise Level In dB(A)	Core Zone dB(A)	*Work zone exposure limit dB(A)	Buffer Zone dB(A)	MoEF& CC Norms dB(A)
Day Equivalent	51.0	90	51.0 - 54.1	55
Night Equivalent	36.3		36.3 - 40.7	45
<b>*Permissible noise for industrial workers as laid down by MOEF&amp;CC Norms</b>				

While comparing with the MoEF&CC Norms, the monitored ambient noise levels are within the limit values for Residential areas.

### 3.6 LAND ENVIRONMENT

**Land use:** The existing land use pattern in the study area has been studied through satellite imagery. The pre-dominant land use of the study area is divided into the following categories, River/ water bodies 1719.37ha (4.95%), Crop land 15699.63 ha (45.21%), Fallow land 1540.72 ha (4.44%), Open scrub land 1897.15 ha (5.46 %), Habitation 697.95ha (2.01%), forest land13173.96 ha (37.93%).

**TABLE 1.2: LAND USE PATTERN OF CORE ZONE**

SNo	Description	Present Area (Ha)	During SOM III Period (2019-20 to 2024-25) (Ha.)	Area at the end of life of quarry (Ha.)
1	Mining	4.19.5	1.18.5	8.94.0
2	Waste Dump	5.94.5	2.18.5	6.66.5
3	Village Road	0.23.5	--	0.23.5
4	Mine approach road	0.73.0	--	0.50.0
5	Infrastructure	0.01.0	--	0.01.0
6	Green belt	0.32.5	0.06.5	0.50.0
7	Unutilised	9.06.0	5.62.5	3.65.0
<b>Total</b>		20.50.0	9.06.0	20.50.0

**Note-**At the end of mine about 8.94.0ha area will be converting into water reservoir.



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About 0.50.0 Ha area will be planted.

**Type of soil:** The mining lease area is a rocky terrain and top soil is found in a few places.

During the study period the pH values of the Soil samples collected were in the range of 5.2 to 5.61. Organic matter in the range of 0.44(%) to 0.63(%), Potassium in the range of 0.0043 to 0.0059, Available Nitrogen in the range of 0.00224 to 0.0048%, Clay in the range of 11.94 % to 13.54 %. This parameter indicates that soil is not so fertile in this area.

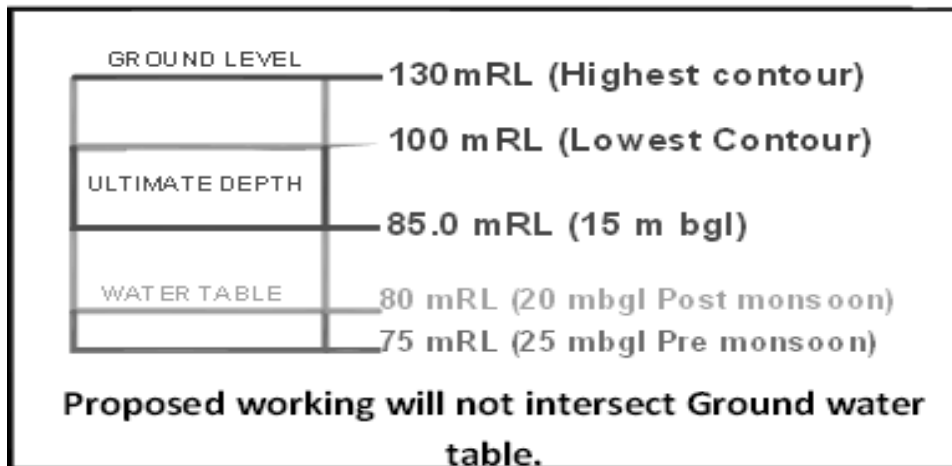
### **3.7 BIOLOGICAL ENVIRONMENT-**

The applied lease area (Buffer Zone) of 20.50.0 ha is Government land and there is no forest land within the applied lease area. There are no sanctuaries, notified biospheres, Elephant Corridors, Birds migratory routes, etc. within 10 km radius. There is a Sathanur Dam Crocodile farm situated at a distance of 5.5Km SW which is nearby Sathanur Reservoir.

The biological study of the area has been conducted in order to understand the ecological status of the existing flora and fauna to generate baseline information and evaluate the probable impacts on the biological environment. There is no Endemic, Endangered & Threatened species has been observed.

### **3.8 HYDROGEOLOGICAL STUDY :**

The water table in the area is 20 m (in rainy season), 25m (in dry season). The ground water in the area is not likely to be effected at all. The ground water level of the mine is much below the level of the working thus, groundwater table will not be intersecting till it reaches to ultimate depth of working.



### 3.9 FLORA OF THE STUDY AREA :

The ecological survey for the core and buffer zone of TAMIN were carried out to identify various species occurring in the area. No endangered and endemic species occurred in the study area.

Floral species observed in study area are *Emblica officinalis*, *Mangifera indica*, *Spondias mangifera*, *Saraca asoca*, *Ficus religiosa*, *Annona squamosa*, *Ficus benghalensis*, *Semecarpus anacardium*, *Anacardium occidentale*.

### 3.10 FAUNA:

The assessment of fauna have been done on the bases secondary data collected from different government offices like forest department, wildlife department etc. There is no Wild Life Sanctuary or Biosphere within the study area of 10 km. There is no Schedule -1 species in and around the area. Domestic animals are only found in the study area. There is Sathanur Dam Crocodile farm situated at a distance of 5.5Km SW which is nearby Sathanur Reservoir.

## 4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

### 4.1 GENERAL :

The opencast mining operations involve development of benches, approach roads, haul roads, blasting, excavation and handling & transportation of materials. If adequate control measures are not taken to prevent/mitigate the adverse environmental impacts, these operations may cause environmental degradation and lead to irreversible damage to the ecosystem. Therefore, it is essential to assess the impacts of





quarrying on different environmental parameters, before starting the quarrying operations, so that abatement measures could be planned in advance for eco-friendly mining in the area.

Mining proposed in this lease is for Black Granite quarry. Mining will be done by open cast semi mechanized method with use of Drilling, wire Saw/Crack powder & minimal control Blasting.

Scientific and systematic opencast mining operations to be adopted in this lease area will ensure that all the environmental parameters during operational stages confirm to statutory standards.

Post project Impact and mitigation measures on various environmental parameters is explained below.

#### **4.2 Air Environment -**

The major contribution of air pollution in an open cast mining are emission of fugitive dust due to excavation, blasting, operation of mining machinery & equipment, loading and transportation. The operation of mining machinery and equipment also adds noxious gas to the environment due to combustion of diesel fuel.

##### **Anticipated Impacts-**

- Mining Operation carried out by opencast mechanized method generate dust particles due to operation of mining machinery, drilling, blasting, loading & unloading during transportation.
- Momentary rise in the suspended particulate matter (PM<sub>10</sub>).
- Gases such as Sulphur Dioxide, Oxides of Nitrogen etc. from vehicular exhaust.

##### **Mitigation measure-**

- Wet drilling to suppress the dust emission from the drilling at its source.
- Drill bits to be sharpened and used, to reduce the dust emission during drilling.
- Regular water sprinkling on haul roads with water tankers, to arrest dust emission arising due to movement of vehicles.



- The vehicles and machinery are kept in well-maintained condition so that emissions will minimize.
- Pollution Under Control certificate will be maintained for the trucks and drivers are instructed to drive at slow speed and proper supervision is maintained.
- The trucks are covered while moving the material and it is ensured that loading is done so that there is no spillage of material during the movement.
- Controlled blasting will be done to reduce the emissions due to blasting.
- Wetting of blast surface to reduce dust emission.
- Plantation is carried out on barrier & remaining land.
- Proper management of waste dump yard.
- Provision of dust filters / mask to workers working at highly dust prone and affected areas.

There will be no major impact on the air quality in this quarry by adoption of the above mitigation measures. The blasting will be done by approved contractor. The blasting will be conducted by the contractor, under the supervision of the Mines Manager, Mines Foreman and Mine Mate/Blaster. All statutory rules will be followed. There will be no storage of explosives in the mine lease area.

#### **4.3 WATER ENVIRONMENT-**

The total water requirement in the mine will be about 1.5 KLD for drinking, spraying wire saw cutting and plantation. Water will be brought from vendors. The water table in the area is 20 m (in rainy season) 25m (in dry season). The ground water in the area is not likely to be effected at all.

#### **Anticipated Impacts-**

- Discharge of water from quarrying operations polluting the surface/Ground water.
- Reduction in quantity of water for agriculture & drinking water
- Contamination of surface/Ground water.
- Changes to the Hydraulic regime.



### **Mitigation measure-**

- The water table in this region is 25 m bgl in pre – monsoon season and 20 m bgl in post – monsoon season. Ultimate working depth is 85mRL. Mine working will not intersect the ground water table, hence, there will be no adverse impact of mining on the ground water quality.
- The mining of Granite will not generate any harmful pollutant. Hence the surface/Ground water will not be contaminated.
- No water source exists within the lease area and there is no any water body or spring inside lease area.
- Garland drains are suggested to be constructed on all side of quarries and external dumps. All the garland drains should be routed through adequately sized catch pits or settling pits to remove suspended solids.
- Suitable drainage system will be provided to prevent surface water from entering into mines directly.
- No waste water will be generated during mining activity.
- Rain water will be collected in the open pits & after de-silting it can be pumped out & it's used for plantation purpose.
  - The water will be tested periodically so as to ensure that the water parameters are within the CPCB prescribed norms.
  - The domestic sewage from toilets will be routed to septic tank and soak away pits to prevent contamination of Ground water.
  - Regular monitoring of Ground water in the wells/Bore wells in the surrounding areas to check for any contamination of Ground Water.
  - The rain water will be harvested in the quarrying pits will pumped to water settling tanks and the clarified water will be utilised for plantation, dust suppression etc.



#### **4.4 NOISE & VIBRATION ENVIRONMENT-**

There is no habitation in and around the core zone and the nearest village is Veeranam about 526 meter in NE direction from mine site. The main source of noise pollution and vibrations will be (i) movement of trucks (ii) Operation of excavator (iii) Drilling (iv) Blasting

##### **Anticipated Impacts -**

- Decrease in speech reception, distraction, insomnia and fatigue and diminished concentration thus adversely affecting job performance efficiency.
- Irreparable cardiovascular, respiratory and neuralgic damages in certain extreme cases.

##### **Mitigation measure-**

- In order to reduce the effect of noise pollution, ear plugs / earmuffs will be provided to workers.
- The workers will not be allowed to work more than one hour in noise prone area and will be shifted to other places.
- Plantation will be carried out barrier & remaining land. The greenbelt minimizes propagation of noise.
- Proper maintenance of vehicles will be done.
- Mine operations will be limited to day time i.e. 8AM to 5PM.
- Power Horns will not be allowed in dumper. Drivers will be further instructed not to use music systems at high volumes.
- Usage of sharp drill bits to reduce noise during drilling.
- Controlled blasting techniques to be used to reduce the noise level.
- Planning and executing blasting so that it is done in favourable conditions to reduce noise and emissions.
- The enhancement of plantation especially at the barriers to arrest the noise propagation.
- The usage of Wire saw and crack powder has also reduced the usage of blasting in the operations thereby reducing the noise and vibration
- Ambient and Source Noise level Monitoring will be conducted on regular basis



It can be summarised that the impact on the present noise levels due to quarrying operations in this quarry will be restricted to the work zone areas only. The impact on the ambient noise levels will not be felt at the settlement areas due to masking effect with the existing noise levels. Hence, the noise levels impact due to the mining operations on community is insignificant.

#### **4.5 LAND ENVIRONMENT-**

The quarry lease had been granted a Lease to quarry Black Granite, in Survey Field No (SF No) 74/1(Part), 126/1A, 127, 132(part), 144/1, 144/2, and 145/2(part), over an extent of 20.50.00 Ha. The land classification of the leased area is Non Forest Government poromboke land. The land exhibits hilly terrain. The height varies from 100 m RL to 130 m RL.

#### **Anticipated Impacts-**

- Change in topography and drainage of applied lease area.
- The land use of the buffer zone may be change in form of roads new building due to the existing project.
- Land degradation due to disposal of large volume of waste materials.
- Creation of infrastructural facilities like office, rest shelter, first-aid centre and other service facilities.
- Exposure of topsoil to wind and water erosion.

#### **Mitigation measure-**

- The existing project will not have much impact on the land use in the surrounding areas as the quarry activities will be confined strictly within the demarcated area.
- The roads and other connectivity are already available. Hence the environment will not be further be degraded.
- No forest land is involved in the current mining project
- During mining operation, about 5,98,978 Cum SB/OB/Granite reject will be generated during scheme of mining period it will be dumped inside the lease area & it will be stabilized by plantation.



- Waste will be dumped in non-mineralized lease area.
- Dust suppression on exposed areas using water tankers.
- The quarried pits after the end of the life of lease will be fenced to prevent inherent entry of public and cattle's.
- Development of a Green belt in all possible areas.
- At the end of mine about 8.94.0 ha area will be converting into water reservoir.

#### **4.6 BIOLOGICAL ENVIRONMENT -**

The applied lease area of 20.50.0 ha is Non Forest Government land and there is no forest land within the applied lease area.

There are no sanctuaries, notified biospheres, Elephant Corridors, Birds migratory routes, etc. within 10 km radius. There is a Sathanur Dam Crocodile farm situated at a distance of 5.5Km SW which is nearby Sathanur Reservoir.

The dust is the only major pollutant which will be generated from different activities of mining

#### **Anticipated Impacts-**

- The effect of particulate matter on vegetation is in the form of incrustation, plugging of stomata, and loss of chlorophyll and reduction of photosynthesis process. Disturbance in plant metabolism due to deposition of dust particles on foliar surfaces leads to reduction in plant growth.
- The activities such as drilling holes, operation of machinery as excavator and movement of dumpers/trucks can have impact in terms of disturbance due to noise; interference in movement etc.
- Clearing of Land will lead to loss of vegetative cover & fauna.
- Dumping of waste leading to loss of habitat for both flora & fauna.

#### **Mitigation measure-**

- In the Quarry area or its proximate areas there is no wetland and the natural flow of water is not available.
- There is no rare, endemic, endangered species.
- There are no wild animals in the area.



- No such significantly important medicinal value species within both the Mine lease areas and its nearby region.
- There are no fish breeding grounds, marine ecology nearby the quarry area, which will be affected due to this project.
- The quarry lease area is devoid of trees and only certain shrubs and grass can be seen.
- Mining activities will be restricted to day time so that fauna will not be disturbed at night.
- Material will be covered during transportation.
- Water sprinkling will be done on haul roads to control fugitive emissions.
- The removal or picking of any protected/unprotected plant will not be permitted
- All the preventive measures will be taken for growth & development of flora.
- Fencing around the pit mouth to prevent fall of animal.
- Creating and developing awareness for nature and wild life in the adjoining villages.
- Plantation will be taken up in consultation with Forest department and species local to the area shall be planted as per findings during baseline environment which help maintain the regional ecological balance, soil and hydrological conditions.

#### **4.7 SOCIO-ECONOMIC ENVIRONMENT-**

##### **Positive Impacts**

- Mining activity will generate employment opportunity both direct and indirect in the study area.
- Increase in business opportunity with contract works, employment through contractors, trucks, tractors and buses on hire basis, running canteens, different kind of shops and other associated jobs in the study area.
- Improvement in the general living standards and knowledge sharing.
- Improvement in the economic growth in the region.
- Other facilities will be provided under CSR activity.



Thus the local people will enjoy the economic upliftment. The following activities will be followed: -

- i. Rural/village & Community welfare.
- ii. Health care of local population.
- iii. Free medical camps.
- iv. Literacy awareness, supports to schools etc.
- v. Environment protection and Environment awareness activities like Environment awareness camps, plantation etc.

Thus the socio-economic status of the area will be improved

#### **Negative Impacts -**

- Dust generated from the mining activity can have negative impact on the health of the workers.
- Approach roads can be damaged by the movement of trucks/dumpers.
- Nearby agricultural field can also be affected by the dust generation.

#### **Mitigation measure-**

- Adequate measures will be adopted to control dust generation like water sprinkling on unpaved road, working sites.
- Construction and maintenance of approach roads.
- Material will be covered during transportation.

### **4.8 OCCUPATIONAL HEALTH & SAFETY -**

#### **Anticipated Impacts -**

- Exposure to dust can result in Respiratory problems.
- Injuries during Project operation are typically related to slips and falls; contact with falling / moving objects; and lifting / over-exertion.

#### **Mitigation measure-**

- The working in the applied lease area will be done with all safety measures under the supervision of qualified staff.
- The workers will be provided dust mask, safety boot, helmet and other safety equipment. A well-equipped first aid box will be maintained at site.





- Regular water sprinkling on haul roads.
- Periodical medical examinations will be carried out for the workers as per Norms.
- Medical records will be maintained.
- Medical facilities will be provided for workers.
- Any early symptom of diseases, if observed, such workers will be taken off in the dusty atmosphere and suitable employed elsewhere.
- Personal Protective Equipment's will be provided to the workers.
- Vocational Training will be provided to the workers.
- Safety of the employee during mining will be taken care as per Mine Regulations.

#### **5. PROJECTS BENEFITS:-**

There are various aspects of this project and allied activities that will be beneficial to the locality, region and nation.

- Black Granite is used as a construction material, a dimension stone, an architectural stone, a decorative stone, and it has also been used to manufacture a wide variety of products.
- The production of Black Granite from the existing project will benefit the State government by the way of revenue.
- Direct and indirect generation of employment, about 35 people will get direct employment in the mine including supervisory staff and labours.
- Improvement in the physical & social infrastructure is another benefit that will arise from this mining project. People in the adjoining area will be helped through the CSR activities and other funds allocation especially for the development of the area.
- Tangible benefits like improved standard of living, health and education.
- This project is beneficial at all levels providing benefits to the industry, local inhabitants and State government.



## 6. ENVIRONMENT MANAGEMENT PLAN

The main objective of environmental management plan is implementation of all environment pollution controlling system effectively to maintain the ecological balance of the area and also to promote the sustainable development during the operational and post operational phase in the area.

The monitoring schedule along with monitoring parameters, monitoring frequencies and duration is given in the below table.

<b>TABLE 1.3 MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS</b>			
<b>Particulars</b>	<b>Monitoring Frequencies</b>	<b>Duration of Station</b>	<b>Important Monitoring Parameters</b>
Surface water/ Ground water Sampling	Twice in a year	-	EC, PH, TDS, TSS, Iron, Hardness, Alkalinity, Chlorides, Calcium, magnesium, Nitrates, Sulphate, manganese & Fluorides.
Ambient air quality monitoring	Twice in a year.	24/8 hr.	PM <sub>2.5</sub> PM <sub>10</sub> , SO <sub>2</sub> and NO <sub>2</sub> .
Noise Monitoring	Twice in a year.	8/1 hr.	Level in dB (A). Day/Night
Soil Sampling	Twice in a year	-	PH, Conductivity, organic matter permeability, water holding capacity, Alkalinity & texture.

## 7. CONCLUSIONS

The project has positive impact to the local people as direct and indirect employment opportunity have been generated. There will be no significant pollution of air, water, soil and noise. Regular monitoring of all the components of environment will be done. Increased social welfare measures taken by the company. All possible environment aspects have been adequately assessed and necessary control measures have been formulated to meet statutory requirement.

The earning source in the targeted area is limited, most of the people in and around the area depend upon the seasonal agriculture and much of the people migrate to nearby towns where good number of industries and factories are growing up.



This project will provide direct/indirect employment for about 35 persons specifically for production, transporting the mineral and heavy vehicle operation.

A meticulously well planned Environmental Management Plan, with various programme schedules and timely execution objectives will ensure that the environmental quality in the area will be maintained within statutory limits.

In addition the Central and State Governments will also gain financially through receipts of income tax, sales tax, royalty, cess, DMFT etc. A part of above revenues will also accrue to the local panchayats, etc. In view of above aspects, the project assumes great importance.

Thus, it can be concluded on a positive note that after the implementation of the mitigation measures and Environmental Management Plan, activities of mine during the mining phase would have negligible impact on environment.

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