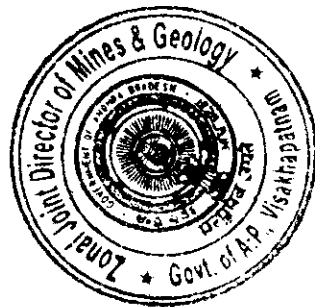


(47)

MINING PLAN FOR COLOUR GRANITE
Over an extent of 1.50 Hectares in Sy. No. 71,
Lingalavalasa (V), Tekkali (M), Srikakulam District, A.P.
(Under Rule 17 of GCDR 1999)

For
M/s. GANESH GAYATRI GRANITES
Srikakulam



Prepared By
V.T. CHANDER
Consultant Geologist & RQP
(RQP / DMG / HYD / 02 / 2001)
H.No. 10-1, Flat No. 202, Mahalaxmi Ganapathi Complex,
Sai Baba Temple Lane, Beside Sri Sai Grammar High School,
P & T Colony, Dilsukhnagar, Hyderabad - 500 060.
☎ : 040-40138229 📠 : 9393383357

CERTIFICATE

The provisions of Granite Conservation and Development Rules '1999 have been observed in preparation of the Mining Plan for Colour Granite over an extent of 1.50 in Sy. No. 71 of Lingalavalasa (V), Tekkali (M), Srikakulam District, Andhra Pradesh., for M/s. Ganesh Gayatri Granites, Srikakulam, whenever specific permissions are required the applicant will approach the concerned authorities.

It is also certified that the information's furnished in the above Mining Plan are true and correct to the best of our knowledge

Date : 16-12-2009

Place : Hyderabad



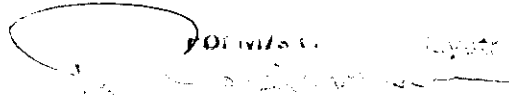
RQP
V. T. Chander
(V. T. CHANDER)

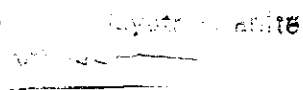
CERTIFICATE

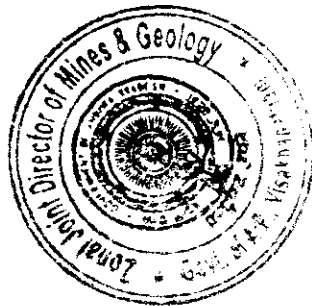
This is to certify that Mining Plan in respect of Quarry Lease area over an extent of 1.50 in Sy. No. 71 of Lingalavalasa (V), Tekkali (M), Srikakulam District, Andhra Pradesh., has been prepared by Sri V. T. Chander, Consultant Geologist & RQP and we agree to follow the same in accordance to the provision of Law

Date :

Place :


LESSEE


PROPRIETOR.

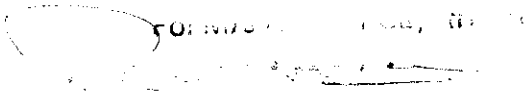


DECLARATION

This mining plan for Colour Granite over an extent of 1.50 in Sy. No. 71 of Lingalavalasa (V), Tekkali (M), Srikakulam District, Andhra Pradesh., has been prepared in full consultation with me and I understand its contents and agreed to implement the same in accordance with the law.

Date :

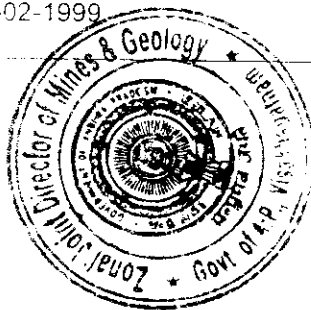
Place :


LESSEE PROPRIETOR.



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1	Copy of the Asst Director of Mines and Geology, Srikakulam , Proceedings No. 5518 / Q / 98 dated 17-02-1999	



LIST OF PLATES

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1.	I	LOCATION CUM KEY PLAN	1 : 50,000
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MINING PLAN ON COLOUR GRANITE
Over an extent of 1.500 Hectares in Sy. No. 71
Lingalavalasa (V), Tekkali (M), Srikakulam District, A.P.

For

M/s. GANESH GAYATRI GRANITES
Srikakulam

By

V. T. CHANDER
Consultant Geologist & RQP

1.0 INTRODUCTION

M/s Gayatri Granites, Tekkali, Srikakulam, a Private Firm, was granted quarry lease for 15 years for Colour Granite over an extent of 1.500 Hectares spread over in Sy. No. 71 of Lingalavalasa Village, Tekkali Mandal, Srikakulam District, Andhra Pradesh., vide Director, Department of Mines and Geology, Hyderabad, Proceedings No. 31893 / R1-3F / 97 dated 21-12-1998. The quarry lease deed was executed on 17-02-1999 vide Assistant Director of Mines & Geology, Srikakulam District vide Proceedings No. 5518 / Q / 98 dated 17-02-1999 for a period of 15 years from 17-02-1999 to 16-02-2014

As per the GCDR Rule 17 of 1999, all the owners of the existing quarries are required to submit the mining plan to the Director of Mines & Geology, Hyderabad for approval within stipulated time

M/s Gayatri Granites, Tekkali, Srikakulam, approached Sri V. T. Chander, Consultant Geologist and RQP (RQP / DMG / HYD / 02 / 2001) for preparation of mining plan in the above mentioned quarry lease area.. Accordingly mining plan is prepared as per the guidelines given by Govt. India. Ministry of Steel & Mines, GCDR Rules 1999..

APPROVED

N. Chander
ZONAL JOINT DIRECTOR
MINES AND GEOLOGY
GOVT. OF A.P. 21/1/2010
VISAKHAPATNAM

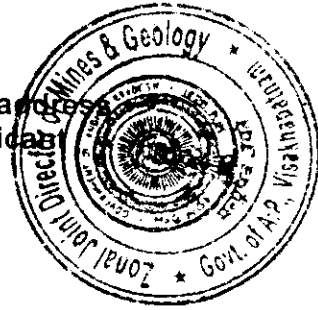


This Mining plan is Approved subject to the Conditions / Stipulations indicated in the Mining plan Approval letter No.....

14077 / MP / 2009 dated 21/01/2010

2.0 GENERAL

2.1 Name and address of the applicant



M/s GANESH GAYATRI GRANITES,

Prop: Sri. K.Ravi Kumar,
Togaram Village
Amadalavalasa Mandal
Srikakulam District
☎ : 9440195672

2.2 Status of the applicant

: Private Firm

2.3 Mineral for which applicant intends to mine

: Colour Granite

2.4 Name and address of the RQP who prepared the Prospecting Report

V.T. CHANDER
RQP / DMG / HYD / 02 / 2001
H.No. 10-1, Flat No. 202,
Mahalakshmi Ganapathi Complex,
Sai Baba Temple Lane,
Beside Sri Sai Grammar High School,
P & T Colony, Dilsukhnagar,
Hyderabad - 500 060.
☎ : 040- 40138229.
☎ : 9393383357.

2.5 Name and address of the Prospecting Agency

: **M/s GANESH GAYATRI GRANITES,**
Srikakulam District

2.6 Details of the area

The applied area falls in the Survey of India, Toposheet No. 74 B / 2 and is bounded East Longitude : 84° - 10' - 04" and North Latitude 17° - 36' - 36". It is situated 1 Km North East of Lingalavalasa Village and 6.5 Km West of Tekkali Town & Mandal Head Quarters. The road leading from Tekkali to Temburu will lead to the applied area by taking a diversion at Lingalavalasa Village to East. The location of the area is indicated in Key Cum Location Map (Plate - I).

DETAILS OF THE AREA

District State	Mandal	Village	Sy. No.	Extent	Ownership of Occupancy
Srikakulam Andhra Pradesh	Fekkali	Lingalavalasa	71	1.500	Govt. Land

2.7 Period for which Quarry lease granted = 15 years

Cadastral Map certified by the Asst. Director of Mines & Geology, Srikakulam in favour of M/s. Ganesh Gayatri Granites, is given as Plate No. II.

2.8 Infrastructure and Communication



Availability of Water	The Ground Water level is 10 to 15 Mts. below ground level at the foot hill. A tank exists south of the applied area (500 M) at the foot hill.
Availability of Electricity	Electricity is available at the Quarry area.
Communication Network	It is situated 1 Km North East of Lingalavalasa (V). The road leading from Tekkali – Temburu and diversion at Lingalavalasa Railway gate will lead to the site. It is situated 5 Kms North West of Tekkali Town. The road leading from Tekkali to Temburu. Amenities like Post & Telegraph Office, Police Station, Primary Health Center etc., are available at Tekkali.
Road Network	The Tekkali Town is located 60 Kms North of Srikakulam on NH 5 from Visakhapatnam to Calcutta. The town is well connected with the road network.
Nearest Rail Head	Nearest Rail Head is located at Amudalavalsa (Srikakulam Road Station), which is located 16 Kms from the Srikakulam and 76 Kms from Tekkali.
Port Facility	Vishakapatnam Port is about 150 Kms from area.
School	Education Facilities from Primary School to College are available in Tekkali Town.
Medical Facility	Medical Facility available in Tekkali Town.

Boundaries (Plate VI)

North	M/s. Devinarayan Enterprises
South	M/s. Ananya Granites
East	M/s. Revathi Granites.
West	M/s. Devinarayan Enterprises

Further vast potential exists for the employment of unskilled labour in the existing Granite Quarries and Allied Small-Scale Industries. The area experiences Semi - Arid Climatic Conditions with an average Annual Rainfall of 1000 mm. The local day temperature varies from 25° C in November to 48° C in April & May Months. The general wind direction reported is SW to NE and SE to NW.

3.0 GEOLOGY AND EXPLORATION

3.1 Physiography / Topography

Physiographically, the area consists of hill ranges raising upto 743 M above m.s.l. There are clusters of mounds and hillocks in the mandal with an undulating topography. The hill ranges observed to the north of Tekkali mostly form tors of well jointed migmatites. There are no prominent streams in the mandal and the drainage pattern in undulated terrain is trellis to sub parallel. Most of the streams

originate from near by hill ranges merge into the tanks and ponds near to their origin. The tanks are the main source of irrigation. The applied area is located on part of hill steeply sloping towards North and East. The maximum height is 56 Mts above ground level in the applied area. The surrounding areas all around the applied area is buzzing with quarrying activity.



The soil is restricted between the boulders only no exposure of soil is visible; the plantation is grown in between the boulders

No streams are existing excepting the flows that will be generated during the rains, the flows that are generated will flow due East and will culminate in the stream due East at a distance of 150 M.

3.2 Regional Geology

The Eastern Ghat Mobile Belt (EGMB) in Andhra Pradesh is more than 600 Km in Length from Srikakulam in the North to Ongole in the South. This belt is more than 100 Km in Width in Northern part and tapers down to less than 20 Km in the South, it has broad arcuate trend with west ward convexity. The NNE –SSW trend in the southern part of the belt changes to NE-SW in the North. EGMB is divided into 3 longitudinal zones viz

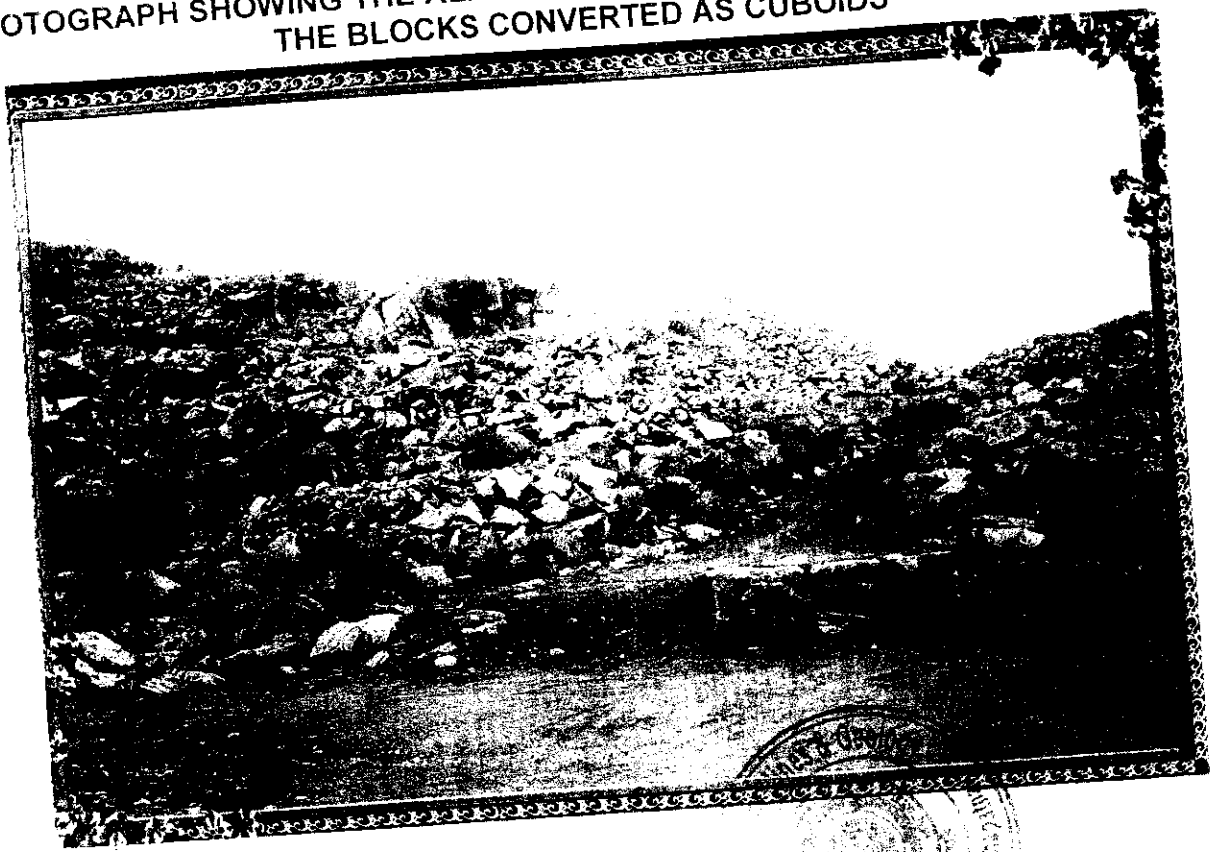
1. Western - Charnockitic Zone
2. Central - Kondalite Zone
3. Eastern - Migmatite Zone

While in the Northern parts in Srikakulam, Vizianagaram & Vishakapatnam Districts the central Khondalite Zone occupies major part of the area. Where as Western Charnockite Zone occurs in the Southern part. The rocks in this belt are represented high grade Granulite facies of Metamorphism and suffered by complex deformation. Eastern Ghats Migmatite Group Super Group i.e., Charnockites derived migmatites & Khondalite derived migmatites.

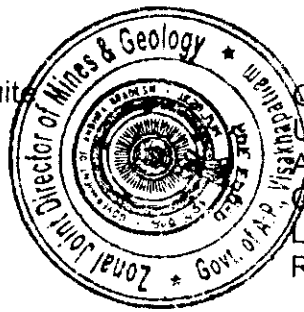
The stratigraphic succession of EGMB is as follows :

Intrusives	Layered Anorthisites and associated Mafics and Chromiferous Ultra Mafics.
Eastern Ghats Migmatite Group Super Group	Charnockite derived migmatites Khondalite derived migmatites
Charnockite Group	Charnockites with Mega Crystic K-Felspar Charnockite Two Pyroxene Granulite / Amphibolites.
Khondalite Group	Calc-Silicate-Granulites Garnet-Silliminite-Quartz-Biotite-K-Felspar- Graphite Gneiss (Khondalite) Quartzite-Garnet-Silliminite

PHOTOGRAPH SHOWING THE ALIGNMENT OF THE BOULDERS IN THE AREA AND
THE BLOCKS CONVERTED AS CUBOIDS



Granitoid Suite



Granitoid with Mega Crystic K-Felspar
Un Differentiated (with Migmatitic Dia Tectite
Augen) Perferoblastic Granite and Gniesses
Garnet- Biotite Homophanus Granite/Gniess
Leptinite, Local Charnockite Neosomes and
Relics

In Srikakulam district the EGMB is represented by wide range of litho units Viz: Charnockites, Khondalites, Twopyroxene Granulites, Migmatites, Leptinites and Intrusive porphyroblastic Charnockites. Large enclaves of Acid Charnockites, Khondalites and Meta-Basic rocks occur within Migmatites, which are largely seen in the area lying between R.Vamsadhara and Coast line.

Local Geology

Four geological traverses were under taken. The first traverse was on the Tekkali – Pathapatnam road, where the rock types are available in the villages of Meelasathivada, V.R.K. Puram, part of Addukonda, Lingalavalasa and Polavaram. The second traverse was on the Tekkali – Meliaputti road where the hill ranges form parts of Tekkali, Gudem, Addukonda, Chintamani and Mukhalingapuram (Lankapadu). The third traverse covers the eastern part of the mandal, covering Ravivalasa and nearby villages and the fourth traverse covers the left over part of Tekkali and Peddasanna and their surroundings.

The area forms a part of the Archaean metamorphic belt of the Eastern Ghats occupied by Khondalite, Charnockite suites of rocks and garnetiferous gneissic granites. The lithounits may be classified as Archaean complex subjected to granulite facies of metamorphism with later quartzo-felspathic injections resulting in migmatisation. The rock types exposed in the mandal are as follows.

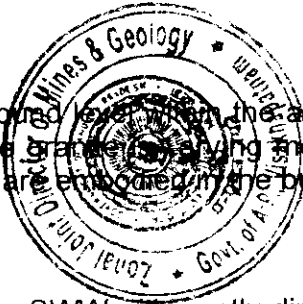
Archaeans Quartzo – Felspathic Gneiss / Granite Gneiss, Quartz – Felspar – Biotite – Garnet Gneiss Migmatite with inclusions of Charnockite, Pyroxene Granulite or Enclaves of Khondalite, Hypersthene Gneiss / Granite, Pyroxene Gneiss

The rock types exposed are mainly hypersthene gneisses and charnockite series of rocks from acidic to basic, migmatities, quartzo – felspathic granite gneiss.

The rock is melanocratic in colour and equi-granular with medium to coarse grade a texture.

The Migmatites and Migmatised Charnockite deposits are commercially known as "SRIKAKULAM BLUE". The Migmatite essentially consists of Blue Quartz and Bluish Grey to Light Grey Felspar with accessory minerals like Hypersthene, Horneblende and Biotite. The rock displays Wavy Banding, Ptygmatic Folding of Bands, Paleosom – Mesosom – Leucosom and Minimal Lineation. A number of parallel slips trending N-S, NNW-SSE and NNE-SSW cut across the Wavy Banding, Pinching and Displacing the Bandings, which imparts additional beauty to the stone besides its Blue Colour.

The arrested enclaves of Charnockite (Locally known as Oii Patches) and healed hairline fractures known as white and black lines cutting across the wavy banding are considered defects.



The maximum height is 56 Mts above ground level from the applied area, sloping towards North and East the Colour of the granite ranging medium to Light Blue Colour. The outcrops of Granite boulders are not covered by the burden.

Structure

The general trend of the formation is NE – SWW with gently dipping (5° – 10°) due East.

Three sets of joints are recorded in the rock. N 45° W – S 45° E is the major joint direction recorded in the area.

1. N 30° W - S 30° E Vertical Nature
2. N 30° E-S 30° W Sub Vertical Nature
3. E - W Vertical

These joints are closely spaced on the surface giving rise to bouldery nature to the deposit. On the other hand they are widely spaced in the depth as noticed in the quarry sections of the existing leases around the applied area and the exploratory pit developed in the applied area..

3.3 Details of Exploration

3.3.1 Prospecting operations carried out

The following prospecting operations were carried out in applied area.

3.3.1-1 Geological Traverses & Mapping

The applied area was traversed to demarcate the exposures of the Colour Granite and to record the structural features in the outcrops, the data regarding litho units were collected from the adjoining quarries and a Surface Geological Map on 1 : 500 Scale prepared (Plate - III).

In Lingalavalasa village, the rock types are medium blue to light blue in colour, exhibiting gneissic texture.

3.3.1-2 Topographic Survey:

A micro optic theodolite is used for conducting the topographic survey. An assumed benchmark of 100 M used to measure the elevation differences in the applied area and also to prepare a contour map on 1 : 500 Scale.

3.3.1-3 Mining carried out

Geological Mapping of the applied area revealed the Migmatites form as a hill rising up to 133 M above ground level.

Pit -1

The exposed boulders covering an area of 1828 M² were drilled by Jack Hammers and a bench of 6 M depth was developed between the Grids N 9950 – 10000 and E 4950 – 5050. a total of 10968 M³ rock mass was retrieved from boulders.

Working Pit

The present working pit of 652 M² is developed in Grids N 10000 – 10250 and E 4975 – 5025. Exposed boulders were drilled by Jack Hammers to convert them into cuboids, a bench of 3 M to 6 M Height above was developed.

In the pit 4.5 M (Average depth) a total of 2934 M³ rock mass was retrieved from boulders.

Total Rock mass Excavated (M ³)	Saleable blocks retrieved (M ³)	Waste Rock (M ³)	Recovery %
13902	3140.796	10803.686	22.59

After secondary cutting and dressing 3098.314 M³ of economic grade and marginal grade rough blocks dispatched during the years 1999 to 2005. Showing the recovery percentage of about 22.59.

Year	Production (M ³)
1998 - 1999	Nil
1999 - 2000	127.748
2000 - 2001	56.208
	300 (70cm x 44cm x 40cm)
2001 - 2002	506.102 (70cm x 44cm x 40cm) (355 pieces)
2002 - 2003	873.652 (50 pieces)
2003 - 2004	851.777 (70cm x 44cm x 40cm) (1355 pieces)
2004 - 2005	425.309 (1055 pieces)

Dump

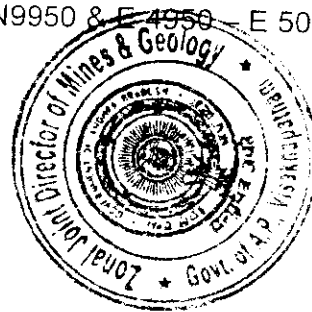
The waste that was generated was dumped in two areas

Dump -1 between the grids N9875 – N9975 & E 5025 -- E 5075 covering an area of 1308 M².

Dump -2 between the grids N9900 – N9950 & E 4950 – E 5000 covering an area of 1308 M².

The following machines are used

1. Excavator -1 No.
2. Compressor -1 No.
3. Jack Hammers - 5 No's



3.4 Estimation of Geological Reserves

3.4.1 Geometry of Deposit

Geological Traverses and the study exposures on the hill facilitated to assess the shape and size of the deposit in the area. It is in irregular shape. The surface of sheet rock is wavy and irregular.

3.4.2 Method of Estimation of Reserves

The exposed deposit is found to be irregular in shape as it is exposed on hill; the volume is computed by Cross Sectional Area method for the applied area considering the exposed region of the hill above the ground level i.e., 40 M average height (Plate - IV).

The average widths along the section line is taken for consultation of sectional influence. The height is calculated from the ground level (Foothill). The area obtained from the cross section is multiplied with the average width of each section and volume of rock mass is arrived.

The soil thickness could not be gauged as the soil is embedded between the boulders and joints.

3.4.2-1 Categorization of Reserves

The entire exposed rock mass is considered as Proved deposit, the volume is computed by cross sectional area method by taking 4 Cross Sections A-B, C-D, E-F & G-H.

Cross Section	Cross Sectional Area (M ²)	Sectional Influence (M)	Volume of Rock Mass (M ³)
A - A1	346.56	32	11089.92
B - B1	1567	40	62680
C - C1	2748	40	109920
D - D1	3662	44	161128
Total Rock Mass Estimated :			344817.9

Mineable Reserves = 3,44,817.9 M³

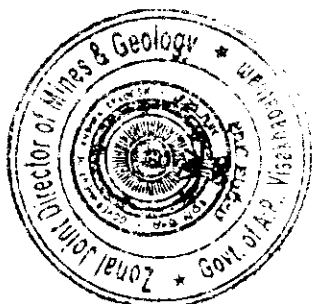
Recoverable Market Grade Reserves @ 25% = 1379271.6 M³ × 0.25

= 86204.475 M³

Life of the Mine = Total Recoverable Market Grade Reserves / Production Per Year

= 86204.475 M³ / 1245 M³

= 69 Years



3.4.2-2 Total Mineable Reserves

The entire rock mass is mineable. 75% of the rock mass is not suitable for extracting the blocks as this comprises of soil creep, rock mass with joints, fractures etc., only 25% is considered for extracting economically marketable blocks.

3.4.2-3 Economic Marketable Reserves

The Granites, having good export market, rough blocks free of defects like fractures, joints, shears, hair line cracks, segregation veins, drastic colour variation and having 120 Cm up size (Gang Saw Size) are mostly preferred by exporters and international buyers. These are known as Economic or Market Grade, where as blocks with sizes of 75 Cm x 75 Cm x 50 Cm (2' / 2') and 70 Cm x 40 Cm x 40cm (2'/1') are generally marketed locally known as marginally economic grade. The mining activity carried out in the QL area revealed 22.59 % of recovery of 1.2 Cum (Gang Saw) size blocks and 2/2' and 2'/1" blocks.

4.0 MINING

4.1 Opening of Mine

The Colour Granite in this area is proposed to be mined by Open Cast, Semi - Mechanized method the Granite deposit in this area is exposed as a hill raising upto a maximum height of 56 M above ground level with in the applied area. The entire hill is covered with boulders with soil creep between the boulders.

The following method of working is proposed :

Stage 1

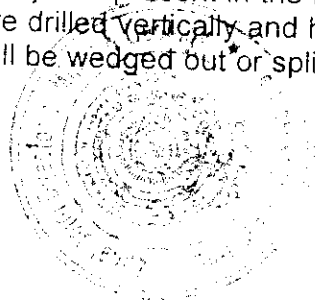
Over Burden / Talus / Side Burden Removal :

Consists of development which includes removal of Weathered, Undersized and Defective Boulders using Proclaim / Excavator and using Tipper, this waste was dumped at dumping yard in the existing QL area of the company. The ramp already constructed during the years will be further developed to reach the working pits.

Stage 2

Extracting Boulder and Cutting them into Blocks with Conventional Methods :

After removal of Weathered, Undersized and Defective Boulders the fresh boulders that are exposed will be split into two or three pieces so that blocks can be made out of them. As the production is only for gang saw size, the boulders are split to the required size at the insitu stage. The undersized and defective blocks are removed. Usually, the advantage of natural joints present in the boulders are taken for splitting them or a line of shot holes are drilled vertically and horizontally at 10 – 15 Cm distance and the primary blocks will be wedged out or split it with the help of



feathers and wedges. If the boulder or big enough one or two holes are drilled and will be blasted with gun powder.

The separated rock mass will be examined for defects and lines, then the block or blocks will be marked in clear area and holes are drilled along the line of marking, with the help of feathers and wedges the waste portions will be separated forming a rectangular blocks. Any bulges will be removed by drilling and wedging making it perfect blocks. A perfect block is that all the sides shall make with each other 90° .

Dressing

After secondary separation the rock mass will be carefully examined to avoid hairline cracks, mineral segregation's and veins etc. The dressing of the rough blocks will be made by chipping the edges and geometrically equating the edges of the block at the dressing yard. The rough blocks obtained after primary cut it will be dressed for obtaining good geometric shape of coloured granite.

Dressing of dimensional rough blocks for export :

Dressing is the final phase of mining operation, wherein the secondary rough blocks are squared into regular perfect rectangular sizes, thereby avoiding uneven bulge or cavities and other defects. Jackhammers with compressor, feather end wedges and sledgehammers are the equipment generally used for dressing the block.

4.2 Drilling

- a) Drill holes of 3 M depth will be drilled in a single row with spacing of less than 0.3 M and burden of 1.6 M or more shall be maintained uniformly. This arrangement will yield rock size of 3 M x 2 M cross section. A bench height of 6.0 M will be tackled in two steps.

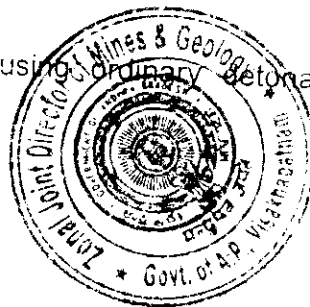
Drilling Parameters :

- i) Drill hole Diameter 32 MM up to 3 M Long
- ii) Depth and Inclination of Drill hole

Generally drilled vertically in a alignment, however in primary cutting in the absence of sheet joints to develop bottom level horizontal holes also be drilled.

- iii) Explosive Type

Gun Powder is used for blasting using Ordinary Detonators. electronic detonators with safety fuse.



4.3 Mining Programme for the next 5 Years

It is proposed to produce 1245 M³ of rough blocks on an average per year in the next five years. Total 24192 M³ rock mass will be retrieved to produce 6228 M³ rough blocks will be produced in five years utilizing an area of 4152 M². the mining will be taken up between the grids N9950 – 10025 & E 4950 – 5050, covering the two existing pits.

1st Year

The mining is proposed from Western part of the existing pit No-1 to the pit, between the grids N9950 – N 10000 & E 4950 – E 5000, a bench of 6 M will be tackled in two stages, covering an area of 771 M² with West faces advancing towards East.

A total volume of 4626 M³ of Rock Mass will be retrieved from which 25% (1156.5 M³) economic grade rough blocks will be obtained generating 3469.5 M³ of Waste Rock.

2nd Year

The mining will continue North of the 1st year workings in the Grids N9975 – N 10025 & E 4950 – E 5000 a bench of 6 M will be tackled in two stages, covering an area of 667 M² with West faces advancing towards East.

A total volume of 4002 M³ of Rock Mass will be retrieved from from which 25% (1000.5 M³) economic grade rough blocks will be obtained generating 3001.5 M³ of Waste Rock.

3rd Year

The mining will be initiated East of 1st year workings in the Pit No-1 between the Grids N9950 – N 10000 & E 4950 – E 5025 a bench of 6 M will be tackled in two stages, covering an area of 667 M² with West faces advancing towards East.

A total volume of 5586 M³ of Rock Mass will be retrieved from which 25% (1396.5 M³) economic grade rough blocks will be obtained generating 4189.5 M³ of Waste Rock.

4th Year

The mining will continue North of 3rd year and east of 2nd Year workings in the Grids N9975 – N 10025 & E 4975 – E 5050 with a Bench Height of 6 M tackled in two stages, covering an area of 921 M². West faces advancing towards East.

A total volume of 3,150 M³ of Rock Mass will be retrieved from which 25% (1000.5 M³) economic grade rough blocks will be obtained generating 4144.5 M³ of Waste Rock.



5th Year

The mining will continue East of 3rd year workings in the Grids N9950 – N 10000 & E 5000 – E 5050, a bench of 6 M will be tackled in two stages covering an area of 862 M². West faces advancing towards East.

A total volume of 5172 M³ of Rock Mass will be retrieved from which 25% (1293M³) economic grade rough blocks will be obtained generating 3879 M³ of Waste Rock.

YEAR WISE PRODUCTION FOR 5 YEARS

Year	Area (M ²)	Bench Height (M)	Volume (M ³)	Recoverable Economic Grade Rough Blocks @ 25% (M ³)	Waste @ 75% (M ³)
1 st	771	6	4626	1156.5	3469.5
2 nd	667	6	4002	1000.5	3001.5
3 rd	931	6	5586	1396.5	4189.5
4 th	921	6	5526	1381.5	4144.5
5 th	862	6	5172	1293	3879
Total	4152		24912	6228	18684
Average	830.4		4982.4	1245.6	3736.8

Quantum of Excavation

During first five years a total of 24912 M³ of Rock Mass will be dislodged to produce 6228 M³ of Market Grade Rough Blocks in this process 18684 M³ of Waste Rock will be generated with an average of 3736.8 M³ Per Year.

Production Schedule

The production of colour granite continuous to through out year expect during monsoon. That is 10 working months, 20 working days per month are considered. The production of 1245.6 M³ per year can be easily achieved in a single shift with sufficient men and machinery.

5.0 STORAGE & HANDLING EXPLOSIVES

Magazine Type and Capacity

The applicant possess the Magazine C, G model with a capacity to hold

- 1,000 No s ED & OD
- 1,000 M of Safety Fuse
- 50 Kgs of Gun Powder



6.0 SCHEME OF WASTE MANAGEMENT PLAN (SOLID & LIQUID)

i) Solid waste for the first Five Years

The granite body exposed to the surface. Hence, the weathering on the surface of the rock closely spaced joints and shears along with inherent defects like Moles, Dark patches and acidic veins contribute a large extent of waste generation during the mining.

It is estimated that in the next five years a total of 18684 M³ of waste is expected to be generated with an average of 3736.8 M³ per annum. The year wise waste generation in next 5 years is as follows :

Year	Waste Generated (M ³)
1 st	3469.5
2 nd	3001.5
3 rd	4189.5
4 th	4144.5
5 th	3879
Total :	18684
Average	3736.8

ii) Dumping Site Particulars

The waste will be dumped in the in the existing Dump -1 between the grids N9875 – N9975 & E 5025 – E 5075 (Shown in Plate No. V).

iii) Estimated Waste Quantity that will be generated in the Entire Period

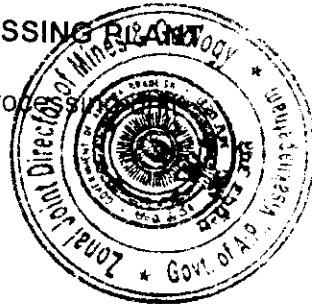
At the rate of 2,898 M³ per year the volume of waste generated in balance lease period i.e. 20 years is estimated to be 57,960 M³.

iv) Utilisation of Waste if not Prevented

- Soil that is obtained from the interstices of the boulders, joints will be utilised for reclamation of degraded area.
- Weathered rock if it is sufficiently soft and devoid of rock fragments will be utilised for roads, filling of road side ditches, formation of approach roads to quarries, construction works etc.
- Large and medium sized waste rock will be used as revetment for deep cut stream sections from preventing from soil erosion.

7.0 DESCRIPTION OF GRANITE PROCESSING

The applicant has no captive granite processing



8.0 MARKET ANALYSIS

i) Assured and expected supply contracts

Mining activity in the adjacent quarries have revealed that only Gang Saw Size of (Economic Grade) Rough Blocks of 2.4 x 1.4 x 1.2 & 3 x 1.9 x 1.8 sizes are required by exporters and will be dispatched to different exporters in Bangalore & Mumbai. The applicant has dispatched 3140.796 M³ to the market.

ii) Ability to supply consumer in time

The applicant is having sufficient men and machinery (Excavator, Compressor, Jack Hammers & Tippers) besides huge and good quality rock at shallow depth. Therefore he is able to supply the material to the consumer in time.

iii) Pattern of demand

Srikakulam Blue Granite of Srikakulam is having very good demand in international market. The prices of rough blocks of gang Saw size ranging between Rs.8,000 to Rs.10,000 depending upon the colour of the rock.

Therefore, the material is having good demand and market is already established for the material from this mine.

9.0 ORGANISATION CHART & SITE SERVICES

Man Power at Quarry

- | | | |
|-------------------------|---|--------|
| a) Manager | - | 1 No. |
| b) Supervisors | - | 2 No's |
| c) Compressor Operators | - | 2 No's |
| d) Tipper Drivers | - | 2 No's |
| e) Hitachi Operators | - | 1 No. |

Besides 20 No's unskilled labourers are employed on daily wages

Site Services

Rest Rooms, First Aid Room, Shelters, Lavatory, Bore Well for drinking water are available at Quarry Site between the grids N 10025 - N 10050 & E 4950 - E 5000.



10.0 ENVIRONMENTAL MANAGEMENT PLAN

10.1 Base Line Information

i) Existing Land Use Pattern

Physiographically, the area consists of hill ranges raising upto 743 M above m.s.l. There are clusters of mounds and hillocks in the mandal with an undulating topography. The hill ranges observed to the north of Tekkali mostly form tors of well jointed migmatites. There are no prominent streams in the mandal and the drainage pattern in undulated terrain is trellis to sub parallel. Most of the streams originate from near by hill ranges merge into the tanks and ponds near to their origin. The tanks are the main source of irrigation.

The applied area is hill land. The land is steeply sloping due West and East. The whole land is covered by sparse vegetation. The soil existing in the applied area is unfertile. The deposit is exposed 56 M above GL and occupies entire quarry lease area. The Hill No. 71 of Lingalavalasa is active with quarries. Areas surrounding the hill are fertile agricultural lands.

ii) Water Regime

No permanent Streams or Drainage lines exist in the Quarry Lease area. A tank is located 150 M South of the applied area in Lingalavalasa village limits.

iii) Flora and Fauna

The entire hill is occupied by scattered and sparse vegetation of thorny trees and small bushes. In the applied area no wild animals are witnessed as per the statements collected from the local people, since past 50 years.

iv) Quality of Air, Ambient Noise Level and Water

The quality of Air, Ambient Noise Level and Water will be disturbed in the quarry areas due to haulage, blasting, drilling & sound generated by the compressors, excavators & loaders etc.,

The fine dust particles will disturb the air quality and the dust will settle on the plants and trees in turn the plants may get dirt.

The fine dust particles will settle in the water bodies and may change the water quality.

v) Climatic Conditions

The area is falling under semi-arid tropical zone. The area is having dry climate. The temperature recorded in this area is 25°C. in winter and about 48°C. in summer seasons. The wind direction is in SW to NE. The average annual Rainfall of the area is 1000 MM



vi) **Human Settlement**

The human settlements located around the lease area are

HUMAN SETTLEMENT (PLATE NO. I)

S.No.	Village	Direction	Distance (M)	Population
1.	Lingalavalsa	South West	1.00	750
2.	Sathewada	North East	1.00	300
3.	Bajarampuram	North West	2.00	750
4.	Laxmipuram	South East	1.75	2,500
5.	Polavaram	South East	1.75	1,000

vii) **Public Buildings, Places & Monuments**

No public buildings important places and monuments are seen in and around the area.

viii) **Does area (Partly or Fully) fall under notified area under water (Prevention and Control of Pollution) Act 1974.**

Not Applicable

10.2 Environmental Impact Assessment

1) **Landscape Changes**

During the next 5 years in addition to the existing pits covering an area of 2480 M² 1338 M² area will be excavated / sliced by 6 M giving an appearance as an escarpment. The mining will alter the shape of the present hill with the quarry pits.

The existing dump will be widened.

2) **Aesthetic Environment**

There is no aesthetic environment prevailing in and around the applied area.

3) **Soil and Land Use Pattern**

The soil cover is absent in the high-elevated areas. However, soil mixed with boulders is fertile but not useful for productive agricultural purposes. Hence, the land is not being used for agriculture purpose. Therefore the mining in this area will initiate utility of the land. The soil generated will be utilized for afforestation.

4) **Agriculture**

The applied area is barren land and far away from agricultural lands. Therefore there is no adverse effect on agriculture.



The fine dust particles will disturb the air quality and the dust will settle on the plants and trees in turn the plants may get dirt.

The fine dust particles will settle in the water bodies and may change the water quality.

5) **Forest**

The applied area does not fall under forest zone.

6) **Vegetation**

The applied area barren hill with an exception of small shrubs, herbs and Thorny bushes grown along the interspaces of boulders and joints where some soil exists. Due to mining all this will be uprooted and the area will be exposed as barren land.

7) **Water Environment**

No Streams or Drainage lines exist in and around Quarry Lease area, except sheet flows during rain days.

Composition of Air (Or Atmosphere) near Earth's Surface

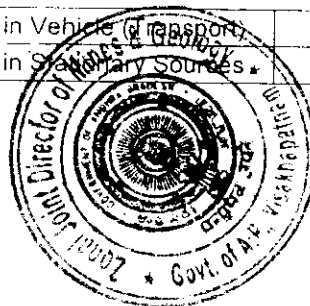
	Constituents of Air	Proportion in Atmosphere
1.	Nitrogen (N ₂)	78.084%
2.	Oxygen (O ₂)	20.946%
3.	Argon (Ar)	0.934%
4.	Carbondioxide (CO ₂)	0.033%
5.	Neon (Ne)	0.003%
6.	Helium (He)	
7.	Methane (CH ₄)	
8.	Krypton (Kr)	
9.	Hydrogen (H ₂)	
10.	Nitrous Oxide (N ₂ O)	
11.	Xenon (Xe)	
12.	Water Vapour (H ₂ O)	Variable
13.	Dust Particles	Variable

Major Pollutants in Air (Or Atmosphere)

1.	Carbon Monoxide	47%
2.	Sulphur Oxides	15%
3.	Hydrocarbons	15%
4.	Nitrogen Oxides	10%
5.	Particulates	13%

Sources of Major Pollutants in Air (Or Atmosphere)

1.	Fuel Combustion in Vehicle (Transport)	42%
2.	Fuel Combustion in Secondary Sources	21%



3.	Industrial Processes	14%
4.	Forest Fires	8%
5.	Solid Waste Disposal	5%
6.	Miscellaneous	10%

8) Air Quality

For air, the following maximum tolerable pollutant levels have to be adopted in accordance with the limits laid down by the Central Pollution Control Board for the industrial and mixed use areas.

Area	Category	Concentration Microgrammes Per Meter Cube			
		SPM	SO ₂	CO	NO _x
A.	Industrial & Mixed Use	500	120	5,000	120
B.	Sensitive	100	30	1,000	30

Air quality will be within the permissible limits by adopting the following :

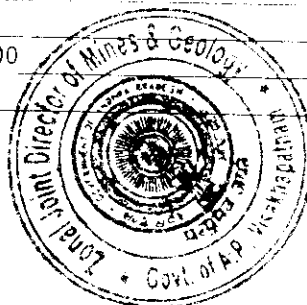
- The dust rising due to drilling will be controlled by covering the drill rods with cloth, dust extractors will also be employed.
- Dust suppression on haul road with sprinkling of water with chemical additives.
- Proper functioning of dust suppression arrangements in the equipment

9) No water course is passing through the area excepting run off streams during monsoon.

The mining of Granite, no adverse effect is anticipated on the water regime of the area.

Tolerance Limits for Industrial Effluents

S.No.	Characteristic	Tolerance Limits for Industrial Effluents Discharged Into Inland Surface Waters	Method of Test Reference
1.	Colour & Odour	-	IS : 2488, Part - I 1966
2.	Suspended Solids, Mg / l, Max	100	IS : 2488, Part - I 1966
3.	Particle Size of Suspended Solids	Shall Pass 850 Micron IS Sieve	IS : 2488, Part - I 1966
4.	pH Value	5.5 to 9.0	IS : 2488, Part - I 1966
5.	Oil & Grease Mg / l, Max	10	IS : 2488, Part - I 1966
6.	Lead (as Pb) Mg / l, Max	0.1	IS : 2488, Part - II 1968
7.	Chloride (as Cl) Mg / l, Max	1,000	IS : 2488, Part - III 1968
8.	Flouride (as F), Mg / l, Max	2.0	IS : 2488, Part - II 1968



9.	Dissolved Phosphates (as P), Mg / 1, Max	5	IS : 2488, Part - IV 1974
10.	Sulphate (as SO ₄ - 2) Mg / 1, Max	1,000	IS : 2488, Part - III 1968
11.	Calcium (as Ca), Mg / 1, Max	Where the mine water is directly used as drinking water maximum tolerable limit is 200 as per the above ISI specification for drinking water.	
12.	Magnesium (as Mg), Mg / 1, Max	Where the mine water is directly used as drinking water maximum tolerable limit is 100 as per the above ISI specification for drinking water.	

It may be seen that the above table for water quality is a considerable modification on the ISI specification 2490 of 1981. The above modified table may be taken as the basis for evaluating the water quality.

10) Noise Levels

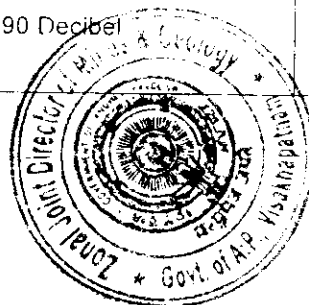
The blasting and the haulage and the drilling of boreholes generate Noise. However, the probable noise level will be within the permissible limits and will not cause harm the applicant will provide suitable protective gear to the workers for minimizing the noise pollution and the machinery will be well maintained.

Regarding noise pollution, the DGMS circulars may be followed. The following table gives the actual noise levels as measured in mining areas :

	Equipment	Noise Level dBA	Measurement Location
a)	Mines		
	Graders	76 - 104	Operators Cab
	Dozers	84 - 107	Operators Position
	Drills	72 - 100	Operators Position
	Front - End Loaders	83 - 101	Operators Position
	Scrapers	92 - 104	Operators Position
b)	Fixed Plant Installations		
	Drill Sharpeners	102 - 122	Operators Position
	Pumps	89 - 100	Operators Position
	Quarry Plant Area	88 - 102	Various External Sites in General Plant Area
	85 M ³ / Min Compressor House with Corrugated Enclosure	52	300 M

Some Common Sources of Sound (Or Noise), their intensity and the level of sound experienced by human beings

	Source of Sound (Or Noise)	Level of Sound (Or Noise)	Effect of Sound (Or Noise) as experienced by Human Beings
1)	Heavy Vehicle (about 8 Metres away)	90 Decibel	Very Loud Sound



The blasting, haulage, machinery and the drilling of drill holes generate Noise. However, the probable noise level will be within the permissible limits within 100 dB (A) and will not cause harm.

- The machinery will be maintained properly to reduce the noise
- The protective noise reducing gear like earmuffs, the company will provide earplugs.
- Proper maintenance of equipment

11) Vibration Levels

It is proposed to use low explosives and less quantity to minimise the effects so that the vibration generated will be feeble within 8 Hz

12) Aesthetic Environment

There is no aesthetic environment prevailing in and around the applied area.

13) Socio Economic Environment

5 villages within a distance of 2 Kms surround the applied area. The main occupation of villagers is agriculture and sheep rearing. The commencement of mining activity in this area improves the socio-economic status of the local people by creation of employment.

14) Occupation Health and Safety

The mining in this area does not involve any hazardous methods. The mining is simple and open cast mining method. In this the possibilities of small injuries is anticipated. This applicant will be providing First Aid facilities at quarry site.

15) Human Settlement

The nearest village Lingalavalasa is situated 1 Km from the area. Therefore there is no anticipation of adverse affect on the human settlement.

16) Recreational Facility

The surrounding village's people will go Tekkali Town for purchases, medical & recreation.

10.3 Management Plan

1. Soil Conservation Methods

The fertile soil available will be used for plants and ground site services on dumps and all along the road. Soil mixed with boulders, which is unfertile which will be used for laying roads.



2. Proposed for Reclamation of Land affected by Mining activity during and at the end of mining

Even after completion of lease period the hill remains except the reduction of elevation and slopes by the pits that will be formed.

3. In case of forest programme for phased compensatory afforestation

The applied area will not come under forest zone.

4. Measures for Dust Suppression

The mining will involve dust rising methods. The dust anticipated during dry seasons, due to haulage will be suppressed by sprinkling water. For this purpose, tractor mounted sprinkler will be deployed. The dust generated during the drilling will be suppressed by covering the drill rods by gunny cloth and dust extractors will also be deployed

5. Measures to minimum use vibrations due to blasting and check noise pollution

The blasting is minimum. It is proposed to use low explosive and less quantity to meet the production requirement. The noise generated by compressors, drilling & machinery like proclain / excavators and tippers will be high. The workers in the quarry area will be provided suitable headgear and noise reducing protective gear (Like Cotton Mufflers etc.) The machinery will be maintained properly for minimizing the noise.

6. Treatment and disposal of water from the mine and beneficiation plant

No treatment is required.

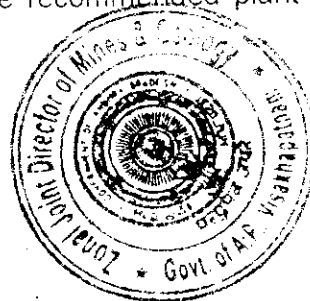
7. Measures for minimising adverse effect on water regime

No Streams or Drainage lines exist in the Quarry Lease area. The mining is confined to elevated place. Therefore no adverse effect is anticipated to water regime

8. Afforestation Programme

The area that is not suitable for mining that is the Western part of the lease area. Phased plantation will be taken up in this area. The plantation will also be taken up at the site services, office and on both sides of road.

The species that have history of good survival and growth under similar site conditions shall be planted. The recommended plant species are given in table below :



RECOMMENDED PLANT SPECIES

S.No.	Trees Species	Common Name	Utility
1.	Axadirachta Indica	Neem	Fuel, Timber, Fodder
2.	Albizia Sp.	Siris	Fodder, Fuel
3.	Dalbergia Sissoo	Sisham	Fodder, Timber
4.	Cassia Sp.	Amaltaas	Fuel, Fodder
5.	Pongaamia Pinnata	Karanj	Fuel, Fodder
6.	Gliricidia Sepium		Fodder, Fuel, Timber
7.	Inga Dulce	Jungle Jalebi	Fodder, Fuel, Timber
8.	Eucalyptus Teriticornis	Eucalyputs	Fuel, Timber
9.	Holoptella Intergrifolia	Kanju	Timber, Fuel
10.	Annona Squamosa	Sharifa	Fuel

9. Preparation of dumping ground for stacking toxic mineral substance

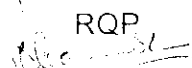
No toxic minerals are present

11.0 ANY OTHER INFORMATION

All the statutory provisions applicable to granite mining leases, such as Mines & Mineral Concessional Rules, Granite Conservation and Development Rules '1999, Mineral and Mining Rules, Payment and Wage Act, Workmen Welfare Act, Employees Provident Fund Act, shall be adhered.

The applicant will implement the quarry operations in obedience to the Rules & Regulations laid down in MMR '1961.

Lessee

RQP

 (V.T. CHANDER)

APPROVED

Per [Signature]
 20/11/2009
**ZONAL JOINT DIRECTOR OF
 MINES AND GEOLOGY
 GOVT. OF A. P.
 VISAKHAPATNAM**



This Mining plan is APPROVED subject to the Conditions / Stipulations indicated in the Mining plan Approval letter No.....
4072/MP/2009 Dated 21.01.2010

ANNEXURE - I

Government of Andhra Pradesh
Department of Mines and Geology

PROCEEDINGS OF ASST.DIRECTOR OF MINES AND GEOLOGY::SRIKAKULAM.

(Present: Sri D.Santhappa, M.Sc.,)

Proc.No. 5518/Q/98,

Dated 17-2-99.

Sub: MINES AND QUARRIES - Quarry Lease for colour granite over an extent of 1.50 Hectares in S.No.71 of Lingalavalasa Village, Tekkali Mandal, Srikakulam District - Granted in favour of M/s Ganesh Gayathri Granites - Execution of Quarry Lease deed - Work orders - issued - Regarding.

- Ref: 1.Proc.No.31893/R1-3F/97, dated 21-12-98 from the Director of Mines and Geology, Hyderabad.
2.8323/97, dt.2-1-98 of the Dt.Collector, Srikakulam.
3.Application dated 17-2-99 of M/s Ganesh Gayathri Granites.

-0000-

O R D E R:

The Quarry Lease granted in favour of M/s Ganesh Gayatri Granites, Thogaram Village, Srikakulam District for colour granite over an extent of 1.50 Hec., in S.No.71 of Lingalavalasa Village, Tekkali Mandal, Srikakulam District for a period of 15 years has been executed on 17-2-99 by the undersigned. The Quarry Lease is valid for a period of 15 years from 17-2-99 to 16-2-2014.

M/s Ganesh Gayathri Granites, Thogaram Village, Anadala-valasa Mandal, Srikakulam District is hereby permitted to enter and work the quarry area under the provisions of A.P.M.M.C.Rules, 1966 and conditions laid down in G.O.Ms.No.317, Industries and Commerce Department, dated 9-2-92 and subsequent instructions issued on the matter from time to time. The lessee should submit the quarterly returns to the concerned Asst.Director of Mines and Geology, Srikakulam, the Dy.Director of Mines and Geology, Visakhapatnam and the Director of Mines and Geology, Hyderabad. This work order is issued subject to the condition that the Government reserve the right to cancel the quarry lease granted and executed under A.P.M.M.C.Rules, 1966 without assigning any reasons and giving notice and the conditions imposed in the grant order and Appendix.

ASST.DIRECTOR OF MINES AND GEOLOGY,
SRIKAKULAM.

To
M/s Ganesh Gayatri Granites,
Prop: Sri M.Ravikumar,
Thogaram Village,
Anadalavalasa Mandal,
Srikakulam District.

Copy submitted to:-
The Director of Mines and Geology, Hyderabad for fav. of information.
The Dy.Director of Mines & Geology, Visakhapatnam for fav. of information.
The Dist.Collector, Srikakulam for favour of information.
The Chief Executive Officer, Z.P, Srikakulam for fav. of information.
The Revenue Divisional Officer, Tekkali for fav. of information.
The Mandal Revenue Officer, Tekkali for information.
The Mandal Development Officer, Tekkali for information.
The Sarpanch, Lingalavalasa Village, Tekkali Mandal, Srikakulam Dt.
for information.