

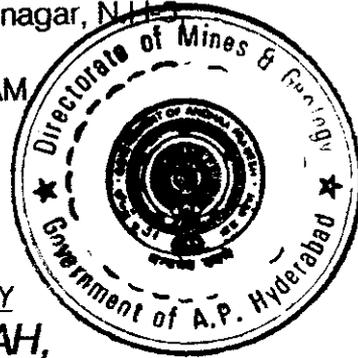
MINING PLAN FOR COLOUR GRANITE AREA

Over an extent of 1.2 hect. Located in S.No. 1 of
Addukonda (V), Tekkali (M), Srikakulam District.

Lessee

M/s Blue Wave Granites,

Prop: Smt B. Susheela Devi,
D. No: 38-13/54, Lakshminagar, N.H.S
Marripalem
VISA KAPATNAM



PREPARED BY

Y. THIMMAIAH,

(RQP / DMG / HYD/10 /2001),
102, Kavya Deluxe Apartments,
Madhuranagar
HYDERABAD - 38.

APPROVED

Under Rule 12 of G.C.D.R.1999

CERTIFICATE

This is to certify that the provisions of Granite Conservation & Development Rule – 1999 & Director of Mines & Geology, Govt. of A.P guidelines have been observed in mining plan preparation for Colour Granite over an extent of 1.2 hect in S.No.1 of Addukonda (V), Tekkali (M), Srikakula Dist, A.P. of M/s Blue Wasve Granite has agreed to implement the same.

The provisions of Mines Act, Metalliferrous Mine Regulation as applicable has been observed in the mining plan. However any specific permission if required, the applicant will approach all such authorities including Director General of Mines Safety.

Certified further that the information furnished in the Mining Plan is in agreement with that supplied by applicant.

For BLUE WAVE GRANITES

B. Susheela Devi

Signature of the Applicant

(B. SUSHEELA DEVI)
Proprietor

Y. Thimmaiah

Signature of RQP

(Y. THIMMAIAH)
RQP/DMG/HYD/10/2001



| <u>SL. NO:</u> | <u>CONTENTS</u> | <u>PAGE NO</u> |
|----------------|--------------------------------|----------------|
| 1 | INTRODUCTION | 1 |
| 2 | GENERAL | 2 |
| 3 | GEOLOGY & RESERVES | 5 |
| 4 | MINING | 8 |
| 5 | DRILLING & BLASTING | 9 |
| 6 | WASTE MANAGEMENT | 10 |
| 7 | USE OF GRANIT | 11 |
| 8 | SITE SERVICES | 11 |
| 9 | ENVIRONMENTAL MANAGEMENT PLAN | 11 |
| 10 | ANY OTHER RELEVANT INFORMATION | 14 |

| <u>LIST OF PLATES</u> | | <u>Scale</u> |
|-----------------------|-----------------------------------|--------------|
| PLATE -1 | LOCATION CUM KEY PLAN | 1:50,000 |
| PLATE -2 | LEASE SKETCH | 1:8000 |
| PLATE -3 | SURFACE GEOLOGICAL PLAN | 1:300 |
| PLATE -3A | GEOLOGICAL SECTION | 1:300 |
| PLATE -4 | YEAR WISE WORKING PLAN & SECTIONS | 1:300 |
| PLATE -5 | ENVIRONMENT PLAN | 1:5000 |

LIST OF ANNEXURES

ANNEXURE -I Notice No.26821/R1-3/200, Dt: 26-9-20033

ANNEXURE -II Photographs of the Area

ANNEXURE -III Year-Wise development & Production for Five Years



This Mining Plan is Approved subject to the Conditions/Stipulations Indicated in the

Mining Plan Approval Letter No.....

36953/MF-3/2.003, dated 25-6-2004

MINING PLAN COLOUR GRANITE OVER AN EXTENT OF 1.2 HECT. IN SY. NO. 1 OF ADDUKONDA (V), TEKKALI (M), SRIKAKULAM (DIST) OF A. P.

(Submitted under Rule 12 of GCDR, 1999)

1.0 Introduction: - The proposed mining plan covers a scientific and systematic assessment of the deposit, which includes details of conservation of the deposit and protection of environment in and around the mining area.

A P.L. was granted to M/s Blue Wave Granites for a period of 2 years from 14-10-2002 to 13-10-2004 vide proceedings No. 5077/Q/98 dated: 14-10-2002.

After prospecting it has been established that adequate reserves of colour Granite are available in this area. The applicant has filed an application for converting the P.L. to Q.L. The Director of Mines & Geology Hyderabad has given a notice ((Copy is enclosed as Annexure-I) to the applicant to submit approved mining plan under rule 12 of GCDR 1999. Accordingly the Mining Plan has been prepared by a RQP who is recognized by the DMG. The Mining Plan is prepared strictly adhering to the guidelines laid down by the DMG.

2.0 GENERAL:

2.1 Name & Address of the applicant

M/s Blue Wave Granites,
Prop: Smt b. Susheela Devi,
D. No: 38-13/54,
Lakshminagar, N.H-5
Marripalem,
VISAKHAPATNAM.

APPROVED

Dr. P. DAYASANKAR
JOINT DIRECTOR
DEPT. OF MINES & GEOLOGY
GOVT. OF A.P. HYDERABAD.

2.2 Status of the applicant

Proprietor firm

2.3 Type of Granite which the applicant intends to mine

Colour Granite

2.4 Address and Registration number of the Recognised person who prepared the Mining Plan.

Y. Thimmaiah, Ph. No: 23733478
102, Kavya Delux Apartments,
Beside Allahabad Bank,
Madhuranagar,
Hyderabad - 500 038.
Reg.No.:(RQP/DMG/Hyd/010/2001)

2.5 Name & Address of the prospecting agency

The applicant has carried out the prospecting work under the guidance of RQP.

2.6 Location of the area:

a) The location of the lease area is shown on survey of India Toposheet No. 74/ B/2 (1:50,000scale) at the junction of the latitude 18° 37' 28" and longitude of 84° 12' 14"

b) Details of the land covered in the specific area.

| State & District | Mandal | Village | Sy.No./ Plot No. | Area in hectares | Ownership & status of occupancy |
|------------------------------|---------|-----------|------------------|------------------|---------------------------------|
| Andhra Pradesh Srikakulam | Tekkali | Addukonda | 1 | 1.2Hect., | Govt. Land (Barren) |

- 2.7 Period for which the quarry lease is required: 20 years
- 2.8 **Lease Boundaries:** The applied Q.L. area is bounded by other P.L. areas like M/s Golden Rock Export on western & NW side, Agarwal Granites is located on NE side, T. S. Industries are located on northern side and M/s Nado Granites is located on southern side of same Survey Number.
- 2.9 **Infrastructure:** The area is located at a distance of 2.5km from the village Tekkali due NW. Tekkali is located on N.H-5 at a distance of 50km from Srikakulam towards Bhubaneswar. The area can be approached by a metal road to a distance of 2km from the Tekkali and then a 0.6km length of cart track will connect to the area from this metal road. Tekkali is the Mandal head quarters and it is the nearest place for School, Market and for Hospital, located at 2.6km from the subject area. The nearest Railway Station is Naupada, located at 8km from the P.L. area on Southeastern Railway line between Srikakulam and Palasa. The nearest airport and seaport is located at Vishakapatnam. Electricity is available in the vicinity of subject area. The subject area is located on top of the hill and it is a rocky terrain. So, the area does not have much vegetation except small thorny bushes.

3.0 GEOLOGY AND RESERVES:

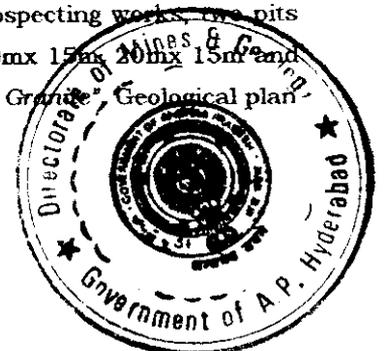
3.1 GEOLOGY

3.1.1 TOPOGRAPHY FEATURES: The area is located on Topo Sheet No. 74 / B / 2 (1:50,000 Scale) at the junction of Latitude of $18^{\circ} 37' 28''$ and Longitude of $84^{\circ} 12' 14''$ (Plate-1). The subject area is located on top of the hillock. It is elevated on southern side and sloping towards NW. There is a maximum relief of 39m towards NW from SW. Due to boulder formation, the area has thorny bushes but there are no big trees. There are no prominent natural drainage channels in and around this area. But the surface water flows through the area and joins to seasonal watercourses flowing in outside the lease area.

3.1.2 REGIONAL GEOLOGICAL SETUP: During the Late- Archaean, along the eastern margin of the Dharwar Craton, intense deformation and high-grade granulite facies metamorphism of a pile of volcano-sedimentary rocks and sub- volcanic intrusive formed in long, linear, rift-related basin resulted in the development of a typical suite of rocks comprising Khonndalite, calc-granulite and charnokite represented by Eastern Ghats.

3.1.3 LOCAL GEOLOGY:

Hypersthene Granulite (charnokite) is occurring in this area as hillock. This rock type is also called as Blue granite in this region. It is formed as large size boulders on top of the hillock i.e. on southern side of the applied area. This rock type might have been derived from high-grade granulite facies metamorphism of a pile of volcano-sedimentary rocks and sub- volcanic intrusive. The rock is formed in NE - SW trend & this type of material is being excavated for last more than ten years from this region. Where as the slopes of the area is covered by the soil and float material i.e. northern side of the subject area. During this P.L. period about 150m^3 of blocks have been excavated from southern side of the area, where the Blue Granite is exposed. Due to prospecting works, two pits are developed in center of the area. These Pits have occupied an area of $40\text{m} \times 15\text{m}$ and $20\text{m} \times 15\text{m}$ and to an average depth of 4m. This type of material is being marketed as "Blue Granite". Geological plan & Sections of P.L. areas is enclosed as Plate-3 & 3A



3.1.4 THE LITHO UNITS:

The main litho unit, exposed in this area is Blue Granite at higher altitudes on southern side and slopes of the area are covering the soil and float small boulders. The rocks are belongs to Late-Archaeon age.

3.1.5 GEOLOGICAL PLAN:

The area recommended for the grant of Q.L. is demarcated on the ground with reference to the village revenue map. Subsequently the area is surveyed using Theodolite and a contour base plan is prepared on 1:500 scale. On this plan the local geology is plotted. The plan is prepared with 3m contour interval (Refer plate no: 3). The eastern boundary pillar of the area is taken as ABM 100m.

3.1.6 GEOLOGICAL SECTIONS:

The contour plan enabled the preparation of geological cross section. In all three NE-SW sections were prepared at 40m interval as shown on plate - 3A.

3.1.7 DETAILS OF PROSPECTING:

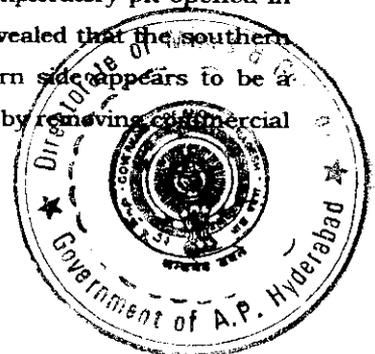
The lease area is prospected by putting down two exploratory pits during P.L. period. During this operation 150m³ of granite Blocks were recovered from the applied area. The plan i.e. Plate No. 3 shows the locations of the prospecting pits:

- a) **Results of Prospecting:** As already explained, the topographical expression of the applied area is in the form of hillock, which is largely boulder. The boulder are of various shapes and sizes, often, it is seen that the boulders vary in size say between 8m X 6m X 6m, and 4mX3mX 1m sizes. The gaps between the boulders are open and it will be useful in cutting the primary blocks.

The exploratory pits are located in one bench, between 100m to 92m RL & 105m to 98m in center of the area. There is a soil filling between the boulders. In these pits, the large boulders, which are exposed above the surface to a height of 1m to 6m, are being excavated. The granite blocks, excavated from this area are sold to the domestic and foreign buyers.

On southern side, the height of the area is more, where as on northern and NW side the height is less. Therefore, the prominent exposures indicate the quantum of granite in the area on southern side. With the virtue of this, the applicant is proposed to the granite quarry towards south of the area from exploratory pits to obtain maximum size of the granite blocks.

The total mass of Rock and soil excavated from the exploratory pits opened in this area and gives to 600m³ material. About 600m³ of rock material is excavated from the exploratory pit opened in center side of the area gives 150 m³. On inspection of the excavations revealed that the southern side of the pits contain good quality of marketable granite. The southern side appears to be a promising zone. Keeping this in view, longer length mine faces is opened by removing commercial granite blocks.



b) Prospecting Pits Dimensions Are as Follows

Table-1

| Pit No. | Length m | Width m | A. Depth m | Lithology | Recovery (Size of the Blocks) | Wastage |
|--------------|----------|---------|------------|-------------------------------|------------------------------------|------------|
| 1 | 40 | 15 | 4 | Top to bottom Granite boulder | 150 m ³ | 450 |
| 2 | 20 | 15 | 4 | | (3.08x2.02x1.52 to 1.20x0.75x0.48) | |
| TOTAL | | | | | 150 m³ | 450 |

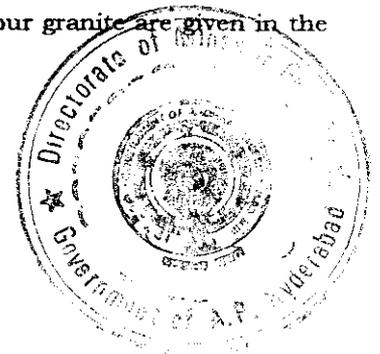
It will be observed from the above table that the granite is available from the surface consists of large boulder formation. The recovery of the marketable blocks from this zone is about 25% and it may reach up to 30% as working goes down from ground levels. Therefore, about 70% of the granite material will have to be scrapped and dumped in the waste yard. During the exploratory activity, a total volume of 600m³ of rock mass was excavated out of, which salable granite won amounted to 150m³. But recovery by and large, has been observed to improve as depth advances. And this inference has been substantiated by observations made from the adjoining working quarries, which have advanced to about 15m depth, from top of the hill. Since the geological set up is identical, recovery factor of 0.30, which has been assumed not far from the ground truth, exists in this region.

- c) **Proposed Exploration:** Since the area is covered by the soil and float material on northern side, it is proposed to dig two trial pits in northern portion of the area to know the thickness of O.B. and the availability of the granite. The proposed exploration will be carried during 1st year, where the locations are shown on plate-3 as PTP-1 & 2.

3.2 ESTIMATION AND CALCULATION OF GEOLOGICAL RESOURCES:

The Prospecting pits has been putdown to an average depth of 6m. The pit sections show there is no weathered rock & soil on top of the area on southern side and 4m height of granite rock is exposed in the form of granite. The pit depth is shown on plate No. 3A. The colour granite reserves are calculated by cross sectional method under Proved, Probable, and Possible categories. The sectional area calculated by the graphical method.

Adequate reserves of granite are available in this area. As stated earlier this area form as a hillock where the outcrops of the granite is exposed to a maximum thickness of 8m under section B-B' and to a maximum thickness of 5m under section C-C' and there are no exposures of granite under section A-A'. So these reserves of 8m to 5m thickness in the section B-B' & C-C' only are considered under proved zone. Since the granite is extending further depth from pit bottom another 2m thickness is taken for each category of probable & possible reserves below proved zone. The reserves are estimated by multiplying the cross sectional area with influence distance of sections. In this is-situe rock, reserve recovery is taken as 25% for proved zone and 30% for probable & possible zones. The recovery is taken as 25% for top layer and 30% for 2nd & 3rd layers after leaving the remaining percentage as waste which includes soil bands and weathered rock, defected rock and voids. The calculations of geological reserves for colour granite are given in the following table.



| Section | Influence Distance m | Sectional Area m ² | Volume m ³ | Tonnage factor | Reserves m ³ | |
|----------|----------------------|-------------------------------|-----------------------|----------------|-------------------------|-------|
| | | | | | Granite Blocks | Waste |
| Proved | | | | | | |
| B - B' | 45 | 420 | 18900 | 0.25 | 4725 | 14175 |
| C - C' | 40 | 425 | 17000 | 0.25 | 4250 | 12750 |
| | | | | Total | 8975 | 26925 |
| Probable | | | | | | |
| B - B' | 45 | 260 | 11700 | 0.3 | 3510 | 8190 |
| C - C' | 40 | 260 | 10400 | 0.3 | 3120 | 7280 |
| | | | | Total | 6630 | 15470 |
| Possible | | | | | | |
| B - B' | 45 | 260 | 11700 | 0.3 | 3510 | 8190 |
| C - C' | 40 | 260 | 10400 | 0.3 | 3120 | 7280 |
| | | | | Total | 6630 | 15470 |

Total Reserves of the Granite available in this area = 22,235 m³

Total Mineral Waste available in this area = 57,865 m³

Reserve Blocked under Final Pit slopes on southern, western & eastern side:

Length of boundary X Cross sectional area of the pit slope x R.F = 215 x 48 x 0.28 = 2,889m³

Total Mineable reserves = Total reserves - Non-Mineable reserves = 22,235 - 2,889 = **19,346m³**

3.3 MINEABLE RESERVES AND THE LIFE OF THE MINE:

Initially, the total quantity of mineable reserves is considered as (economic) marketable reserves. In this way a total mineable reserves of 19,346m³ is available in this Q.L. area. The production is proposed to obtain 850m³ per year. At this rate of production, the expected life of the mine is calculated as given below.

Life of the Mine: Mineable Reserves / Annual production = 19,346/850= 22.76 years

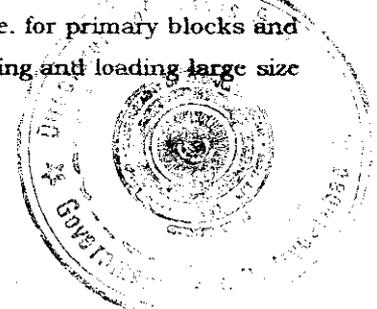
4.0 MINING :

a) Selection of mining quarry site:

The southern side of the area is the prominent one for Granite out crops. So the prospected area will be developed towards south in coming Q.L. period.

b) Method of Working:

To cut down cost and for achieving targeted production of granite, the operations are planned to carry out by semi mechanisation with the machinery listed in para 4.6. The use of various machinery is explained under method of working. The excavator is to be deployed for removal small boulder and waste material from working face. The excavator will be also used for shifting the granite blocks from working face to the stockyard. The other pneumatic tools like Jackhammers, etc will be deployed for shot hole drilling in granite rock i.e. for primary blocks and as well as secondary blocks cutting. The crane will be deployed for removing and loading large size blocks into trucks.



4.1 Stages / Cycle Time of quarry development:

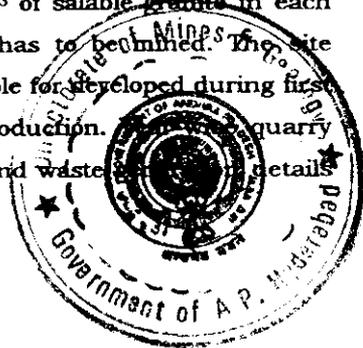
- a) The southern part of the granite is seen to be good for mining, Which is having large size boulders have to be removed to expose the full width of rock of colour granite. The workings will be commenced on southern portion of the exploratory Pits and will be extended up to lease boundary.
- b) The removal of side burden consisting of small size boulders will be followed by extraction of large size boulders by cutting them into blocks by conventional methods. To develop the mine, the loose and small size boulders will be removed from working face about 3400m³ of granite material has to be excavated per year. During 3 hours operation of the excavator in each shift about 14m³ of waste will be removed. The applicant will deploy one hire tippers at his mine to transport the waste from quarry site to dumping yard.
- c) Extraction of large size boulders by modern method likes developing benches in working face.
- d) Dressing of marketable blocks.
- e) **Waste removal and extraction of large Boulders:** After removal of the waste from working face, the large size boulders will be made exposed. Usually advantage of natural joints present in boulders is taken for Splitting. A line of drill holes will be drilled and split by mild blasting. For this operation, pneumatic hammer drills and stationary Air Compressor will be used.
- f) **Extraction of Primary Block:**

After the removal of waste rock around boulders, it will be exposed and clearly visible to the naked eye. Based on the size and shape of the boulder, the jackhammer holes will be drilled vertically across the boulder from one end to other end at close interval to $\frac{1}{2}$ to $\frac{3}{4}$ th depth of the boulder. Later the drill holes will be filled with light explosives (aluminum Nitrate, Gelatin & Gunpowder) and blasted to separate the primary block from mother rock. The size of the primary block will be depend on the size of the boulder and the size will be around from 8mx 4 x 3 to 4mx 2m x 1m based on the boulder size. The primary block will be separated from the mother rock and it will be observed for all type of defects. If the primary block is free from defects, it will be cut in to secondary blocks with the help of jackhammer drilling and blasting. Based on the size of the primary block, the drill holes will be drilled across the primary block to its half of the thickness from one end to other end and later it will be separated from primary blocks by using offset cutting. The size of the primary blocks will be around 8mx 4 x 3 to 4mx 2m x 1m.

4.2 **Scheme of Development and Production for the First Five Years Plan Period:**

The scheme of development and production for the first five years has been planned taking into consideration the nature of the deposit within the lease area. It is observed form existing pits that larger boulders cover the southern part of the area and therefore the development of the quarry is confined towards south from existing pits. The proposed year wise working area is demarcated on plan and section and it is enclosed as plate No. 4.

Year Wise Development: As a first step towards regular production schedule, the side burden consisting of small and shapeless boulders and soil will be scrapped and removed. In this manner the large size boulders will exposed. It is envisaged to produce 850m³ of salable granite in each year. To raise this target production about 3400m³ of rock mass has to be removed. The site inspection reveals that the southern portion of the existing pits is suitable for developed during first five years programmme. Most of the south zone will give good production. quarry development schedule is described below and year wise production and waste details are given in Annexure-III.



1st Year: During first year operations, it is proposed to develop the area on southern side of pit-1 & 2 in two benches of 3m height each. The workings will be carried out over a length of 60 and to a width of 10m. The benches will be oriented in E-W direction and obtain about 877m³ of granite blocks and 2631 m³ of waste granite in this year.

2nd Year: In second year, the production of granite blocks will be obtained by advancing the southern face of first year workings towards south to a width of 9m and over a length of 64m. In this year and about 843 m³ of granite blocks and 2531 m³ of granite waste will generate.

3rd Year: In third year, the production of granite blocks will be obtained by advancing the southern side two benches of second year workings towards south to a distance of 9m without changing the orientation of the benches and obtain the production of about 856 m³ of granite blocks and 2671m³ of granite waste will generate.

4th Year: In third year, the production of granite blocks will be obtained by advancing the southern side two benches of third year workings towards south to a distance of 8m without changing the orientation of the benches and obtain the production of about 822 m³ of granite blocks and 2466m³ of granite waste will generate.

5th year: The production of 771 m³ granite blocks will be obtained in 5th year from southern side of the area by advancing the fourth year workings towards south to a distance of 7m.

During this five years operations a total rock mass of 22,234m³ will be excavated and 4,169m³ of granite blocks will be recoverable from this rock mass and the remaining material of 12,514m³ of material will be treated as waste.

4.3 Separation Of Primary Blocks By Pre-Splitting (Primary Cut)

a) Line Drilling Method:

During the Prospecting period, the applicant has used line-drilling method for separation of primary blocks from mother rock. In future quarry operations also, the same method will be adopted.

- i) Once the waste is removed around the large boulders, the primary cuts is taken up depend on the size of the boulder and it will be around from 8mx 4 x 3 to 4mx2m x 1m. These primary blocks will be cut by jackhammer drilling and blasting and these blocks will be dislodged from in-situe position by an excavator.
- ii) Presently the applicant is using line-drilling method for cutting the primary blocks, which involve drilling and blasting.
- iii) The holes are charged with low explosive cartridge like gunpowder and non-delay detonators for smooth blasting.
- iv) The use of delay detonators causes fragmentation and cracks in rocks. The non-detonating cords are inserted into the holes and then the holes are water stemmed or air stemmed and plugged at the mouth and fired.
- v) Thus the blocks will be separated from the mother rock, which are pulled off from the face with cranes or shovel.



4.4 Sub Division of Large (Primary) Block Into Secondary Block (Secondary Cuts):

- i) Once the primary blocks are dislodged form large boulders, depending upon the dislodged material, secondary blocks are cut in to a size of 2m x 2m x 3m to 2m x 1.5m x 1m blocks with the help of jackhammer drilling and offset cutting.
- ii) The commercial blocks shall be trimmed so as to form right angles to each other. Defects like black lines, fractures and penetrative cracks are taken care of this stage for forming commercially marketable blocks.
- iii) The sizes of the blocks that could be formed from the ROM of this property will be in the following dimensional ranges.

| | | |
|--------|---|---------------|
| Length | : | 100 to 310cm. |
| Width | : | 75 to 250cm. |
| Height | : | 50 to 150cm. |

4.5 LIST OF MACHINERY:

- a) Since it has been decided to undertake semi-mechanized mining operations, the following mentioned mine machinery would be deployed.
 - i. Excavator - One (Bucket capacity: 1m³, Boom length: 7m, Model: Tata Hitachi 200 LC)
 - ii. 50 CFM - AIR compressors - One
 - iii. Jack Hammers - Three units
 - iv. 10 tonnes Crane - 1
- b) Minor Tools: Chisels, Crowbars, Pick axes spades and hammers of different sizes (including, sledgehammers).

5.0 DRILLING & BLASTING:

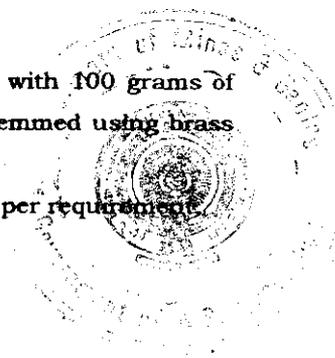
Drilling and blasting plays vital role in determining the size and shape of rough blocks. Drilling pattern is important in developing a working face and also is preparing the rough blocks suitable for their use in appropriate processing units.

a) Broad Blasting Parameters:

Drill-Hole patterns for primary and secondary smooth blasting. Uniform single line, equidistant holes (line drilling) will be deployed for separation of blocks from mother rock depending up on the boulder size. The same technique is deployed in the sheet rock zone also. In the case of large boulder the primary drilling will be in the form of equidistant vertical holes to take out blocks of Gang Saw.

b) Drilling Parameters:

- i. Drill holes diameter: 74/Pmm
- ii. Depth and inclination of the blast holes: 1m to 2m depth of the vertical will be drilled depend on the thickness of the boulder in case of separation primary blocks.
- iii. Spacing and burden: 3 x 1.6 to 2m
- iv. Stemming and charging of the blast hole: The blast hole will be charged with 100 grams of explosives and filled with clan pills subsequently, the shot hole will be stemmed using brass stemming rods.
- v. Explosive type: (1) Packed aluminum Nitrate, (2) Gelatin, (3) Gunpowder as per requirement.



- c) **Safety precautions to be taken for protection of public & private properties of adjacent to the lease:**

Since muffled blasting technique -only will be used in this area, no effect will be there on environment. More ever there are no important monuments or public properties like roads and power lines. The distance is maintains as per DGMS

- d) **Handling of blocks within the Quarry: safety rules and GCDR 1999.**

The applicant will deploy an excavator with a bucket capacity: 1m^3 , Boom length: 7m, Model: Tata Hitachi-200 and 10 tonnes capacity crane at his mine to handle primary and secondary blocks.

- e) **Transportation of the blocks from quarry to yard and to the destination:**

The applicant will deploy one tipper at mine to transport the waste blocks, unfinished and finished blocks from quarry site to yard and trucks will be hired to transport sized dimensional blocks from yard to destination. The loading of blocks will be done by cranes.

- f) **Storage and Handling of the Explosives:**

The applicant has proposed to go for M&S type portable magazine to store explosives required for blasting. An area is located for the magazine and it is shown on plate-4. The site is located at a safe distance from the quarry, strictly adhering to the rules and regulations laid down for safe storage and handling of the explosives as per the explosives Act the location of the magazine is shown in plate IV. The applicant at the moment is not in possession of blasting license. He has, however, applied for a license and it is under stood form the applicant that the papers are being processed at the appropriate level and expected to be granted license with in two months.

6.0 WASTE MANAGEMENT PLANT :

6.1 Dumping Yard:

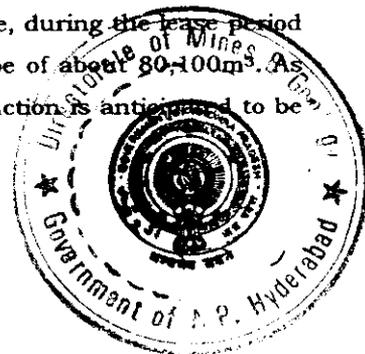
During P.L period, a small amount of waste was dumped on NW side of the area, in non-Mineralised zone. During this five years about 12514m^3 of waste granite will be generated from this lease area. This waste will be stocked over a length of 75m, width of 45m and to a height of 4m on NW side of the area as shown on plate 4.

6.2 Solid Wastes For First Five Years:

As explained in the previous para, it is planned to produce about 850m^3 of marketable dimensional granite blocks per year. As recovery rate of only 25% is considered, to win possible 850m^3 Granite Blocks, it will be necessary to handle 3400m^3 of granite. Thus about 75% of production amounting to about 2550m^3 of waste will be generated over period of one year. Such kind of waste will be dumped at the dumping yard. So in first five years the quantity of such kinds of waste will be about 12514m^3 . Much of the solid waste will be disposed for road construction and building material.

6.3 Estimated Waste that will be generated over the Entire Lease Period of 20 Years:

Envisaging a production of anticipating $20,025\text{m}^3$ of dimensional granite, during the lease period of 20 years, the material to be handled for winning this quantity will be of about $80,100\text{m}^3$. As explained in previous para about 75% of the material handled for production is anticipated to be waste, i.e. $60,075\text{m}^3$.



6.4 Measures to be Adopted for Solid Waste:

1. **Reduction of waste of source:** Even though the percentage of recovery is only 25% to 30%. The applicant has proposed to improve the recovery by implementing technical development in cutting and handling the dimensional granites besides exploring market for small blocks.
2. **Good operating practices:** As explained above the good operating practices will be maintained by the applicant.
3. **Technology change:** It is also planned to review the technological developments from time to time to augment production of improved goods.
4. **Products Change:** It is also planned to make small blocks and reduce the quantum of solid wastes, there in.
5. **Disposal of waste as last resort:** As explained already, the waste will be dumped at yard earmarked on northern side of the area.

6.5 Liquid Waste:

The operation of the mine will not generate any appreciable quantity of liquid waste. The ground water table in this belt is 20m, below from the surface and since the quarry depth will not reach up to this depth in the near future, flooding by ground water is not anticipated. Even the rainwater will flow through the slopes of the area and no water will remain in the pit.

7.0 USES OF GRANITE:

(1) Rough Blocks, (2) Slabs, (3) Panels, (4) Tiles, (5) Monuments, (6) Other fancy and decorative items like pen stand, (7) Flower vases, (8) Table Tops - Teapoys and others, (9) High precision products like surface plates for engineering applications.

7.1 Market Analysis:

The owner has contacted the buyers at Chennai and other important trade centers to export the rough blocks of colour Granite from this area. The agents come from Chennai, Bangalore, Jaipur and purchase the raw blocks. The applicant has invested some money and deployed necessary machinery and men at mine. Thereby he will be able to supply granite in time to his consumers. Presently the applicant is concentrating his market in India. Marketing of granite in International Trade is entirely different from local market. The International Market is mostly dependent on the agents of buyers. The buyers imposed restrictions on Quality and on the sizes. The lessee will stand to face international market demands. International market is mainly through personalized approach with assurance of quality and "After sales service" periodical visits to the buyer countries will not only help in sustaining the clientele, but also enable us to measure up to competition and assess international market trends. The above details are well known to the applicant & all efforts will be made to face the market trend and demand to ensure that the venture is a profitable one.

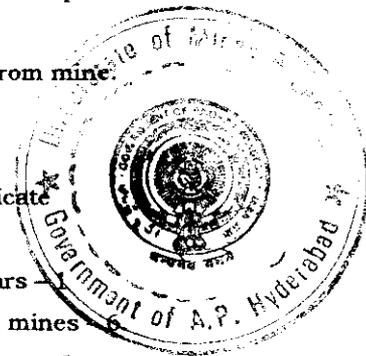
7.2 Description of Processing Plant If Any:

The applicant produces only rough blocks and directly sells them to buyers from mine.

7.3 Organization Chart for the Quarry:

The applicant has appointed following employees at his mine.

- | | |
|---|--|
| i) Mines Manger Diploma in Mining - with second class mines manager certificate | |
| ii) Blaster Cum Mate | S.S.C. with blaster certificate holder |
| iii) Mines Supervisor | SSLC, Experience in Granite Mine for 10 years |
| iv) Skilled workers | experience for more than 10 years in granite mines |
| v) Unskilled workers | For helping the Mines Manager and Supervisor - 6. |
| vi) Machine Operators | ITI qualified persons - 2. |



8.0 SITE SERVICE:

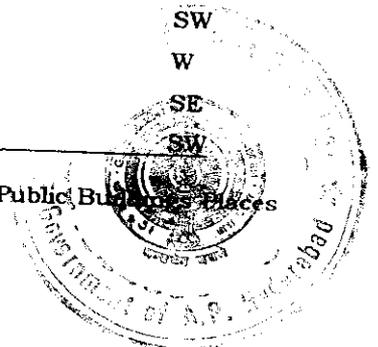
The details of employment are already covered in above para. Regarding site services, a mine office is established in lease area and other statutory requirement like rest shelter, drinking water and first aid facility shall be provided. Routine maintenance and minor repairs shall be undertaken at the mine itself. The workers shall be commuting for work from the adjoining villages and therefore no colony shall be maintained in the Q.L area.

9.0 ENVIRONMENT MANAGEMENT PLAN:**a) Baseline Information:**

- i. **Existing land use pattern:** The subject area is a wasteland belonging to the Govt. and it was being used for grazing before getting the P.L.
- ii. **Water Regime:** There are no perennial water sources in and around the applied area within 500m radius. The rainwater flows through the slopes of the area and drained off through a seasonal nalas.
- iii. **Flora and Fauna:** The subject area is devoid of trees and but it is covered by the thorny bushes. Excepting for the presence of reptiles and other minor wild life like rabbits, field rats etc., no major wild life exists in this area.
- iv. **Quality of Air, Water and Ambient Noise Level:** The subject area is away from Industries and Human settlements. The impact of Granite mining by the applicant is not likely to have any serious adverse impact on the existing environment. Indeed Mining even on a small scale does cause some environmental hazard and efforts therefore, are necessary to mitigate the environmental hazard created. The management is well aware of this aspect and will take all action to mitigate the hazard.
- v. **Climate Conditions:** The peak summer will be in the month of May. A highest temperature of 45° C is recorded in the area during the month of May and the lowest temperature of 12° C is recorded in the month of January. During 2002 - 2003 the rainfall of the area was of the order of about 240mm.
- vi. **Human Settlement:** The following villages are within 5Km radius of the applied area. The population, distance and location of these villages with respect to Applied Area are given in the following table.

| S. No | Name of the Village | Population | Distance (Km) | Direction |
|-------|---------------------|------------|---------------|-----------|
| 1. | Tekkali | 8500 | 2.5 | SE |
| 2. | Polavaram | 2400 | 4.0 | SW |
| 3. | Sitapuram | 1200 | 2.0 | S |
| 4. | Peddasana | 1000 | 5.0 | SW |
| 5. | Tirlangi | 600 | 2.5 | SW |
| 6. | Ramakristnapuram | 500 | 1.5 | SW |
| 7. | Sativada | 300 | 3.5 | SW |
| 8. | Savarabanjarupeta | 450 | 3.5 | W |
| 9. | Ragunadhapuram | 650 | 2.0 | SE |
| 10. | Lakshmiapuram | 200 | 3.5 | SW |

- vii. **Public Building, Places of Worship and Monuments:** There are no Public Buildings, Places of Worship or monuments within or near the area.



viii. *Whether the area falls under the notified area of water act 1974:* No

b) **ENVIRONMENTAL IMPACT ASSESSMENT (NEXT FIVE YEARS)**

- (i) **Land Degradation:** During first five years there will be hill slicing over an extent of about 2846m² area, dumps will occupy the area of about 3375 m²
- (ii) **Quality of Air: Quality of Air:** There are chances for air pollution at the time of jackhammer drilling and at the time transportation of Mineral & waste. But this air pollution will be controlled to the ambient air quality standards (24 hours) i.e. SO₂ =120ug/m³, NO₂ = 120ug/m³, Suspended Particulate Mater (SPM) =500ug/m³, Respirable Particulate Mater (size <10um) (RPM)=150ug/m³, CO=5mg/m³ and Pb =1.5ug/m³ by keeping waste cloth around jackhammer road and the drill hole at the time drilling. The mine roads will be sprayed with water, before starting the transportation of Mineral & wastes for minimise air pollution
- (iii) **Water Quality:** There are no chances for change in quality of surface water or ground water because the quarry operations will be carried out on top of the hill in rocky terrain. There are no chances of ground water encounter in the quarry.
- (iv) **Noise Levels:** In the quarry, the machinery operations like jackhammer drilling, compressor and excavators will generate sound pollution. To minimise this sound pollution within the permissible limits, the machinery will be operated at different places at different times. The sound pollution can be reduced by conducting periodical maintenance to the mining equipment. The permissible limits of noise are given below.

Permissible noise exposure for different period of time is given below:

| Duration per day (Hrs) | Sound level dBA |
|------------------------|-----------------|
| 16 | 80 |
| 8 | 85 |
| 4 | 90 |
| 2 | 95 |
| 1 | 100 |
| ½ | 105 |
| ¼ | 110 |
| 1/8 | 115 |

- (v) **Vibration Levels:** The vibrations may be not caused due to shot hole drilling and since the operations are only for short duration. The impact of vibration will be negligible.
(Vibration tolerance limit is prescribed in Is 6922-1973 DGMS circulars.
Where maximum allowable limit of 70mm/sec
For soil and weathered rock and 100mm/sec
For hard rock as the peak particle velocity for safety and design of the strata.)
- (vi) **Water Regime:** Mining operations will be carried out on the top of the hill. Hence, neither ground water table nor the general surface drainage pattern is effected.
- (vii) **Socio-Economics:** The local inhabitants of the area live in the villages surrounding the mine area and their main occupation is Agriculture. In a small way they rear cattle and sheep for substance. The mining activity in this belt will benefit the locals both directly and indirectly. The direct beneficiaries will be those who get employed in the mines as skilled and un-skilled workers. The indirect beneficiaries will be those who open small business to sell goods required by the residents whose "Per Capita" income will be enhanced by the mining activity, and thereby their purchasing power. In the long run a lot of social goods is expected in the

comparatively backward area when the inhabitants will be able to send their children to school... the change, though slow, is bound to be perceptible.

(viii) **Historical Monuments Etc:** There are no historical monuments in vicinity of the area, and therefore their setting effected due to mining does not arise.

c) ENVIRONMENTLA MANAGEMENT PLAN

1. **Storage and Utilisation of Topsoil:** The waste consisting of the no topsoil in this area.
2. **Proposal for Reclamation of Land Effected by mining:** No reclamation is proposed in the first five years period because, the mining has to be continued further depths from five years pit bottom. The reclamation could be possible only after excavation of mineral from workings.
3. **Afforestation Programme:** In every year about 50m length and 7m width of buffer zone will be planted on eastern side of the area. About 38 saplings consisting of Neem, Teak will be planted per year over an area of 50m x 7m 3m grid interval. Year wise plantation area is shown in plate-4.
4. **Stabilization and vegetation of Dumps:** About 12514m³ of waste material will be generated during this plan period. This waste will be dumped on NW side of the area to a height of 4m and the dumps will be stabilized by the retaining wall.
5. **Measure to Control to Erosion / Sedimentation of Watercourses:** There will not be any erosion / sedimentation in the area because, there will not be any water discharge from mine workings.
6. **Treatment and Disposal of Water from Mine:** No water will be discharged from the mine.
7. **Measures for Minimizing Adverse Effects on Water Regime:** No adverse effects are anticipated on water regime.
8. **Measures for Ground Vibrations Due to Blasting:** In view of the smooth blasting technique adopted ground vibration will be minimal.
9. **Measures for Projection of Historical Monuments and Rehabilitation of Human Settlements likely to be disturbed due to Mining Activity:** Does not arise.
10. **Socio Economic benefits Arising out of Mining:** Few labors will get employment and the State Government will get royalty and sales tax due to mining and selling of the granite.

10.0 ANY OTHER RELEVANT INFORMATION:

- i) The applicant will strictly follow Mineral Concession Rules and Metaliferrous Mines Regulation Act of 1961 and Mines Rules of G.C.D.R 1999 while carrying out mining activity.
- ii) The Management will ensure good production and there is good revenue to the Government of Andhra Pradesh and Government of India through taxes. The industry is an asset to the nation.
- iii) The Mining Plan is prepared by recognized geologist to fulfill the requirement of rule 12 of the Granite Conservation and Development Rules 1999.

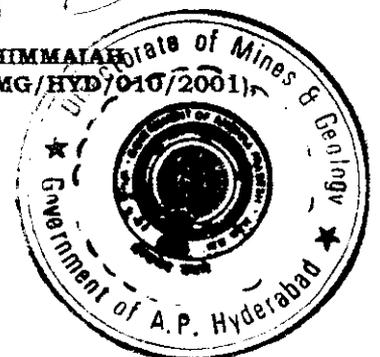
For BLUE WAVE GRANITES

B. Sankar Das
Signature of the applicant
Place : Srikakulam
Date :

APPROVED

Dr. P. DAYASANKAR
JOINT DIRECTOR
DEPT. OF MINES & GEOLOG
GOVT. OF A.P. HYDERABAD.

Y. THIMMAIAH
(Rg.No.RQP/DMG/HYD/010/2001)



GOVERNMENT OF ANDHRA PRADESH.
DEPARTMENT OF MINES AND GEOLOGY:: HYDERABAD.

NOTICE NO. 29733/R1-3/2003.

DATED: 18.10.2003.

Sub: Mines and Quarries -Quarry Lease application - Extent: 1.20 Hectares -
Sy.No. 1 - Village: Addukonda - Mandal: Tekkali -Dist: Srikakulam -
infavour of M/s. Blue Wave Granites for a period of 20 years - Approved
Mining Plan called for - Reg.

Ref: 1. From M/s. Blue Wave Granites, QL application dt: 5.8.2003.
2. From the ADM&G., Tekkali Lr/File No. 297/Q/2003, dt: 9.9.2003.

M/s. Blue Wave Granites in the reference 1st cited, have applied for grant of Quarry Lease for Colour Granite over an extent of 1.20 Hectares in Sy.No. 1 of Addukonda Village, Tekkali Mandal, Srikakulam District.

2. The Asst. Director of Mines and Geology, Srikakulam in the reference 2nd cited, has stated that the applied area is held under P.L. by the applicant. Further, the Asst. Director has recommended for grant of Quarry Lease for Colour Granite over an extent of 1.20 Hectares in Sy.NO. 1 of Addukonda Village, Tekkali Madnal, in Srikakulam District in favour of M/s. Blue Wave Granites for a period of 20 years.

3. The Director of Mines and Geology, Hyderabad after careful examinations of the above proposals of the Asst. Director of Mines and Geology, Srikakulam has proposed to grant the Quarry Lease over an extent of 1.20 Hectares in Sy.No. 1 of Addukonda Village, Tekkali Mandal, Srikakulam District in favour of M/s. Blue Wave Granites for a period of 20 years subject to the submission of Approved Mining Plan within six months from the date of receipt of this Memo.

4. Therefore, M/s. Blue Wave Granites are requested to submit the Approved Mining Plan for the bove area referred to Para 2 for a period of 20 years within a period of six months from the date of receipt of this notice for consideration of their Quarry Lease application.

5. Further, they are also informed that if they fail to submit the Approved Mining Plan within a period of six months from the date of receipt of notice it will be presumed that they have no interest in their Quarry Lease applicatiion and further action will be taken based on the material available with the Director of Mines and Geology.

Sd/- T. Devendranath,
DIRECTOR OF MINES AND GEOLOGY.

Attested
[Signature]

for DIRECTOR OF MINES AND GEOLOGY.

To:
[Signature]
M/s. Blue Wave Granites, Prop. B. Susheela Devi,
38-13-54, Laxmi Nagar, NH-5 Road,
Visakhapatnam-5430018.

Copy to Asst. Director of Mines and Geology, Srikakulam.
Copy to Approved Mining Plan Section.





Photograph shows the P.L. area of M/s Blue Wave Granites, Located in S.No:1 of Adunko, Srikakuli (Srikakulam Dist) (two prospecting pits can be seen in this photo)



Photo shows the Blue granite blocks, obtained from exploratory pits, located in above said P.L. area.

Year- Wise Granite Production

Annexure -III

| Year & FRLS | Working Areas m ² | Bench height | Volume m ³ | R.F | Production m ³ | |
|-------------|------------------------------|---------------|-----------------------|------|---------------------------|-------------|
| | | | | | Granite | Waste |
| I 106-103 | 60 x 10 = 600 | 3m | 1800 | 0.25 | 450 | 1350 |
| | 103-100 | 57 x 10 = 570 | 3m | 1710 | 0.25 | 427 |
| | | | | | <u>877</u> | <u>2631</u> |
| II 112-109 | 64 x 9 = 576 | 3m | 1728 | 0.25 | 432 | 1296 |
| | 109-106 | 61 x 9 = 549 | 3m | 1647 | 0.25 | 411 |
| | | | | | <u>843</u> | <u>2531</u> |
| III 112-109 | 65 x 9 = 585 | 3m | 1755 | 0.25 | 438 | 1316 |
| | 109-106 | 62 x 9 = 558 | 3m | 1674 | 0.25 | 418 |
| | | | | | <u>856</u> | <u>2571</u> |
| IV 109-106 | 70 x 8 = 560 | 3m | 1680 | 0.25 | 420 | 1260 |
| | 106-103 | 67 x 8 = 536 | 3m | 1608 | 0.25 | 402 |
| | | | | | <u>822</u> | <u>2466</u> |
| V 106-103 | 75 x 7 = 525 | 3m | 1575 | 0.25 | 393 | 1181 |
| | 103-100 | 72 x 7 = 504 | 3m | 1512 | 0.25 | 378 |
| | | | | | | <u>2315</u> |

