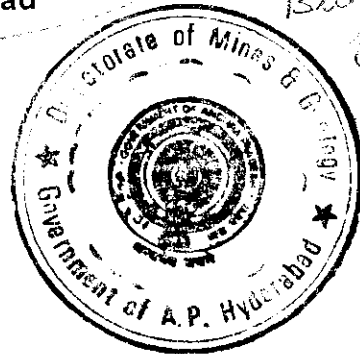


MINING PLAN ON COLOUR GRANITE
Over an extent of 4.00 Hectares in Sy.No 1
Adukonda (V), Tekkali (M), Srikakulam District, A.P.

For

M/s. Reliance Granites (P) Ltd.
Hyderabad



*Is approved for
Bharat
Hyderabad
5
conferred
Hyderabad*

APPROVED

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.

☎ : 55618351, 24068218 ✉ : 31056234

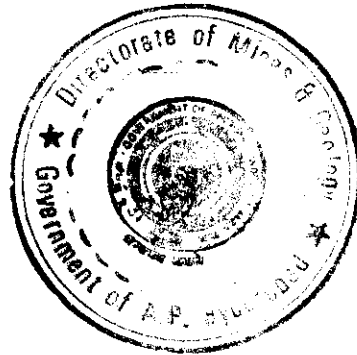
CERTIFICATE

This is to certify that mining plan in respect of Quarry Lease area over an extent of 4.00 Hectares in Sy. No. 1, of Addukonda (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 :

For Approval *[Signature]*

Applicant
Director



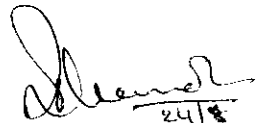
CERTIFICATE

The provision of Granite Conservation and Development Rules 1999 have been observed in the Mining Lease of Coloured Granite over an extent of 4.00 Hectares in Sy. No. 1, of Addukonda (V), Tekkali (M), Srikakulam District, Andhra Pradesh., for M/s Reliance Granites (P) Ltd, Hyderabad, whenever specific permissions are required the applicant will approach the concerned authorities.

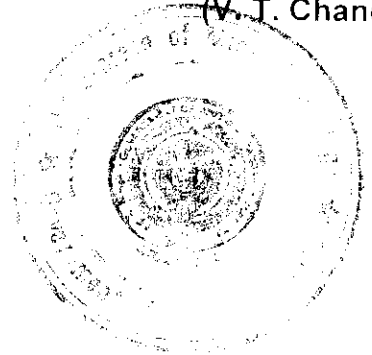
It is also certified that the information's furnished in the above mining plan are true and correct to the best of our knowledge

Date : 24-8-04

Place : Hyderabad

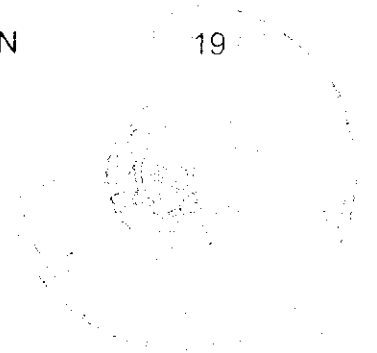

RQP 24/8

(V. T. Chander)



INDEX

S.NO	CONTENTS	PAGE NO
01	INTRODUCTION	01
02	GENERAL	02
03	GEOLOGY	03
04	EXPLORATION / MINING ACTIVITY	05
05	RESERVES	07
06	MINING	08
07	STORAGE & HANDLING EXPLOSIVES	11
08	SCHEME OF WASTE MANAGEMENT PLAN	11
09	DESCRIPTION OF GRANITE PROCESSING PLANT	14
10	MARKET ANALYSIS	14
11	ORGANISATION CHART	14
12	ENVIRONMENT MANAGEMENT PLAN	14
13	ANY OTHER RELEVANT INFORMATION	19



LIST OF PLATES

PLATE	TITLE	SCALE
I	LOCATION & KEY PLAN	1 : 50,000
II	LEASE AREA PLAN	1 : 8000
III	GEOLOGICAL PLAN	1 : 500
IV	GEOLOGICAL CROSS SECTIONS	1 : 500
V	MINE LAY OUT & YEAR WISE PRODUCTION PLAN	1 : 500
VI	MINE LAY OUT & YEAR WISE PRODUCTION PLAN & CROSS SECTIONS	1 : 500
VII	ENVIRONMENTAL PLAN	1 : 5,000

LIST OF ANNEXURES

- I
Copy of the Asst. Director, Srikakulam,
Proceedings No. 1849 / Q / 93 dated 27-07-1993.

Lx

MINING PLAN ON COLOUR GRANITE
Over an extent of 4.00 Hectares in Sy.No. 1
Adukonda (V), Tekkali (M), Srikakulam District, A.P.

For

M/s Reliance Granites (P) Ltd.
Hyderabad

By

V. T. Chander
Consultant Geologist & RQP

This Mining Plan is Approved subject to the
Conditions/Stipulations indicated in the
Mining Plan Approval Letter No.....
22689 / V-1/2004, dated 9-9-2004

1.0 INTRODUCTION

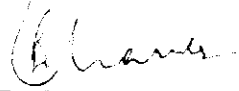
M/s Reliance Granites (P) Ltd, Hyderabad, was granted Quarry Lease of 15 years for Colour Granite over an extent of 4.00 Hectares in Sy. No. 1 of Addukonda (V), Tekkali (M), Srikakulam District, Andhra Pradesh., vide Director of Mines & Geology, Hyderabad., Proceedings No. 19831 / K1 / 93 dated 30-06-1993. The lease deed was executed on 27-07-1993, vide Asst. Director, Mines & Geology, Tekkali, Srikakulam District., Proceedings No. 1849 / Q / 93 dated 27-07-1993 for a period from 27-07-1993 to 26-07-2008

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

M/s Reliance Granites (P) Ltd, Hyderabad, approached Sri V. T. Chander, Consultant Geologist and RQP (RQP / DMG / Hyd / 02 / 2001) for preparation of mining plan in the above mentioned quarry. Accordingly mining plan is prepared as per the guidelines given by Govt. India, Ministry of Steel & Mines, GCDR Rules 1999, for the existing quarry.



APPROVED


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

2.0 GENERAL

- 2.1 **Name and address of the applicant** : M/s Reliance Granites (P) Ltd,
Plot No 33,
Hindi Nagar,
Panjagutta,
Hyderabad.
- 2.2 **Status of the applicant** : Private Limited Company
- 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.
☎ : 55618351, 24068218
✉ : 31056234
- 2.5 **Name and address of the Prospecting Agency** : M/s Reliance Granites (P) Ltd
Hyderabad
- 2.6 **Details of the Area :**

The quarry area falls in the Survey of India Toposheet No.74 B/2 and is bounded East Longitude : 84° - 12' - 45" and North Latitude : 18° - 36' - 43". It is situated 5 Kms North West of Tekkali. The road leading from Tekkali to Temburu will lead to the Site. The location of the area is indicated in Key Cum Location Map (Plate - I).

The details of the area are as tabulated below :

District State	Mandal	Village	Sy.No.	Extent	Ownership of Occupancy
Srikakulam Andhra Pradesh	Tekkali	Addukonda	1	4.00	Govt. Land (Existing Quarry)

- 2.7 **Period for which Quarry Lease Granted = 15 Years**

Cadastral Map certified by the Asst. Director of Mines & Geology, Srikakulam, in favor of M/s Reliance Granites (P) Ltd, is given as Plate No II.



2.8 Infrastructure and Communication

Availability of Water	The Ground Water level is about 6 to 7.0 Mts. below ground level at the foot hill.
Availability of Electricity	Electricity is available at the Quarry area.
Communication Network	The applied area is 5 Kms North West of Tekkali. The road leading from Tekkali to Temburu will lead to the Site. 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.

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.

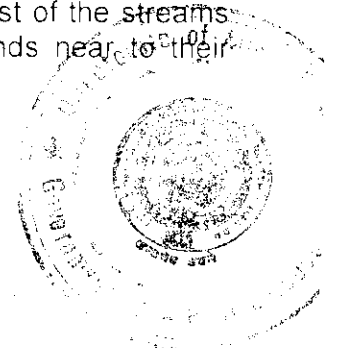
Boundaries

North	Lease area of M/s. Gomathi Minerals & Granites
South	Agricultural Lands of Tirlangi Village
East	Lease area of M/s. V. V. A. Granites
West	Applied area of M/s. Sun Granites

3.0 GEOLOGY

3.1 Physiography

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 nearby hill ranges merge into the tanks and ponds near to their origin. The tanks are the main source of irrigation.



The applied area forms a part of the southern edge of the hill "Addukonda" steeply sloping due south East, the relief of the area is 60 M above with in the applied area. Vegetation is developed in between the boulders. Drainage is well developed (Dendritic Drainage Pattern) in general, all these streams developed on the hills culminate in the tank located 2.5 Kms West of Tekkali Town & Mandal HQ's.

Regional Geology

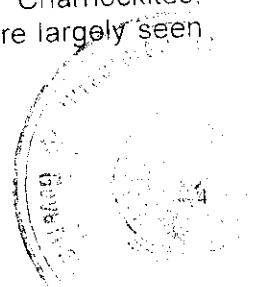
The Eastern Ghat Mobile Belt (EGMB) is more than 600 Km in length from Srikakulam in the North to Ongole in the South. This belt is more than 100 Km in width in Northern part and tapers down to less than 20Km in the South. it has broad actuate trend with west ward convexity. The NNE -SSW trend in the southern part of the belt changes 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. The stratigraphic succession of EGMB is as follows :

INTRUSIVES	Layered Anorthisites and associated Mafics and Chromiferous Ultra Mafics.
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
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.

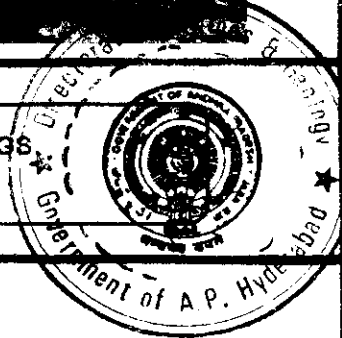
In Srikakulam district the EGMB is represented by vide range of litho units Viz Charnockites, Khondalites, Twopyroxene Granulites, Migmatites, Leptinites and Intrusive porphyroblastic Charnockites. Large enclaves of Acid Charnockites, Khondalites and Meta-Basic rocks occur within Migmatites, which are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



PHOTOGRAPH SHOWING THE VIEW OF THE WORKINGS
IN GRIDS E 50 - E 200 & N 150 - N 200



PHOTOGRAPH SHOWING THE VIEW OF THE WORKINGS
IN GRIDS E 150 - E 250 & N 100 - N 150



Local Geology

The hill range trending in a NE-SW direction for about 5 Km covering a total area of 933.24 Ha. Out of which about 529.24 Ha. falls under 'Reserved Forest' and the rest forms Revenue Poramboke Land. At present, about 40 leases have been granted and most of the leases are in operation. The rock type is light blue to dark blue in colour exhibiting gneissic texture. The leases granted in the eastern part yield light colour granite blocks and the leases granted in the western part hard yield dark blue colour blocks.

The **Migmatites** and Migmatized 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, Hornblende and Biotite. The rock displays wavy banding, pygmatic 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 oil patches) and healed hairline fractures (known as white and coloured lines) cutting across the wavy banding are considered defects.

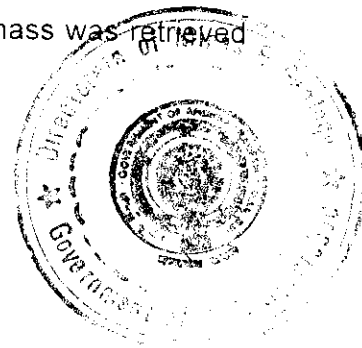
Two sets of major joints :

1. N 70° E - S70°W
2. N 20° E – S20°W

4.0 EXPLORATION / MINING ACTIVITY

4.1 Present Status

- The mining operations started in the year 1994.
- The development activities like laying Roads, creating the infrastructure like Site Services, Office was taken up.
- The sub grade rock mass was excavated and hauled to the dumping yard.
- The mining operations were carried out at central portion of the area, as the recovery was not good this pit was abandoned after developing the pit by 2 M between grids E 150 – E 250 & N 100 – N 150.
- A second pit was developed in the RL 145 in western part of the area between grids E 50 – E 200 & N 150 – N 200, where the percentage of recovery was encouraging.
- The exposed boulders were shaped to cuboids using Jack Hammers and the pit was developed to 4 M. The mining is of semi-mechanised type.
- In the quarry Pit 1, 30 x 20 x 2 M, a total of 1,200 M³ Rock Mass was retrieved from hill, nearly 95% of waste was reported by the company.
- In the quarry Pit 2, 30 x 20 x 4 M, a total of 2,400 M³ rock mass was retrieved from hill, nearly 85% of waste was reported by the company.



- Generation huge quantity of waste rock. In the area through coloured granite occurs as exposed deposit with loose undersized boulders on the surface. With the closely spaced joints and sheared joints contributed a great extent of waste generation in the form of defective boulders. Further natural defects like moles, dark patches and veins are present in the rock (observation from dumped material):
- After secondary cutting and dressing 243.491 M³ of economic grade rough blocks recovered and were dispatched.
- The mining operations were stopped due certain administrative problems during the year 1997.
- The mining activity is re-initiated recently.

DETAILS OF PRODUCTION SO FAR MINED FROM THE BEGINNING OF THE QUARRY AND DISPATCH DETAILS

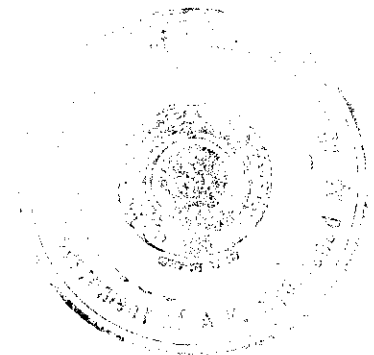
Year	Production(M ³)	Dispatch(M ³)
1994 – 1995	105.854	105.854
1995 – 1996	33.41	33.41
1997 – 1998	104.227	104.227
1999 – 2000	Nil	Nil
2000 – 2001	Nil	Nil
2001 – 2002	Nil	Nil
2002 – 2003	Nil	Nil
Total :	243.491	243.491

The following machines were used :

1. L & T Komatsu PC 200-6 - 1 No.
2. Compressor XA 175 - 2 No's.
3. Jack Hammers - 6 No's.
4. Tippers - 2 No's.

The Company employed the following :

1. Mines Manager - 1 No.
2. Supervisor - 1 No.
3. Skilled Workers - 10 No's.
4. Semi-Skilled Workers - 12 No's.
5. Labour - 10 No's.



4.2 Future Programme

Since the deposit is proved no further exploratory programme is recommended.

5.0 RESERVES

5.1 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.

5.2 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 by taking 4 Cross Sections A-A1, B-B1, C-C1, & D-D1.

Cross Section	Cross Sectional Area (M ²)	Sectional Influence (M)	Volume of Rock Mass (M ³)	Recoverable Rock Mass for Blocks @ 40% (M ³)	Recoverable Rock Mass for Blocks @ 15% (M ³)
A - A1	2,526	100	2,52,600	1,01,040	15,156
B - B1	3,230	100	3,23,000	1,29,200	19,380
C - C1	2,452	100	2,45,200	98,080	14,712
D - D1	1,106	60	66,360	26,544	3,981.6
Total Rock Mass Estimated :			8,87,160	3,54,864	53,229.6

5.3 Categorization of Reserves

The entire deposit exposed on the surface is classified under "Proved".

5.4 Total Mineable Reserves

No rock mass will be blocked under safety slopes as it is hill deposit.

Total Rock Mass

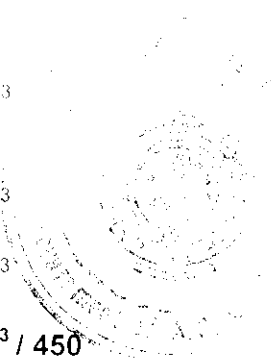
Mineable Rock Mass = 8,87,160 M³

Recoverable Rock mass 40%
(60% constitute Soil, Undersized Boulders) = 3,54,864 M³

Recoverable Market Grade Reserves @ 15% = 53,229.6 M³

Life of the Mine = 53,229.6 M³ / 450

= 118 Years



5.5 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 gang saw size are mostly preferred by exporters and international buyers. These are known as Economic or Market grade. The Srikakulam Blue Granite is totally export oriented. Hence, all the blocks of gang saw size are only demanded by the exporters. The estimated quantity of rough blocks from the total rock mass is calculated @ 40% = 3,54,864 M³. The recovery of marketable grade is further anticipated at 15% from the above. Hence, 15% of 3,54,864 M³.

Economic Marketable Reserves = 53,229.6 M³

6.0 MINING

6.1 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 to maximum height upto 60 M above ground level with in the applied area with boulders.

The following method of working is proposed

Stage 1

Over Burden Removal

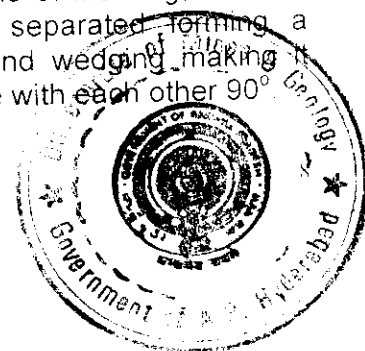
Consists of development which includes removal of weathered, undersized and defective boulders using proclain/excavator and haulage by tipper, this waste will dumped at dumping yard. A ramp already constructed during exploratory mining will be further developed to reach the working pits.

Stage 2

Extracting boulder and cutting them into blocks with conventional methods

After removal of Weathered, undersized and defective boulders the fresh boulders 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 drill 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 splitted with a AGFRACT chemical compound. Sometimes feather and wedges are placed in series of holes drilled for splitting the boulder.

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



Dressing

The blocks realized 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.

6.2 Scheme of Mining & Year Wise Production

During mining operations the applicant proposes to produce 2,247 M³ of Coloured Granite in next 5 years period with an average production of 450 M³ per year. In order to produce this quantity an area of 2,497 M² will be utilized.

1st Year

The mining operations start from Northern side of the existing Pit 2 in NW-SE located in the grids E 00 – E 100 and N 150 – N 250 forming a bench height of 6 M and the bench will advanced towards North West. During the first year a total area of 450 M² will be utilized.

In the First year it is planed to produce 405 M³ of economic grade rough blocks. To produce this quantity an area of 450 M² (30 x 15 M) will be utilised. Producing 2,700 M³ of rock from which 15% (405 M³) economic grade rough blocks will be obtained and 85% (2,295 M³) of waste rock will be realised.

2nd Year

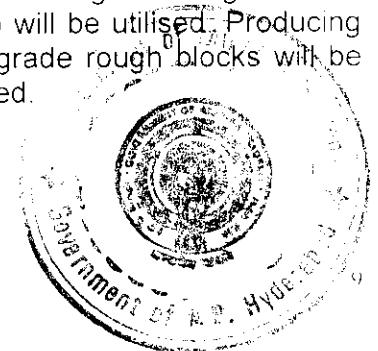
In the 2nd year the mining will start North West of 1st year workings in NW direction in the grids E 00 – E 100 and N 150 – N 250 with South East oriented faces advance North West maintaining average of 6 M bench height. An area of 450 M² will be covered during this year.

In the Second year it is planed to produce 405 M³ of economic grade rough blocks. To produce this quantity an area of 450 M² (30 x 15 M) will be utilised. Producing 2,700 M³ of rock from which 15% (405 M³) economic grade rough blocks will be obtained and 85% (2,295 M³) of waste rock will be realized.

3rd Year

In the 3rd year the mining will start West of the pit and 1st year workings in SW direction pit in the grids E 00 – E 100 and N 150 – E 250 with North East oriented faces advance South West maintaining average of 6 M bench height. An area of 450 M² will be covered during this year.

In the third year it is planed to produce 405 M³ of economic grade rough blocks. To produce this quantity an area of 450 M² (30 x 15 M) will be utilised. Producing 2,700 M³ of rock from which 15% (405 M³) economic grade rough blocks will be obtained and 85% (2,295 M³) of waste rock will be realized.



4th Year

In the 4th year the mining will shift to North of the 1st & 2nd year workings in the grids N 150 – N 250 & E 50 – E 150 maintaining an average of 6 M bench height. An area of 547 M² (Area arrived with Plano Meter) will be covered during this year.

In the fourth year it is planned to produce 492 M³ of economic grade rough blocks. To produce this quantity an area of 547 M² will be utilised. Producing 3,282 M³ of rock from which 15% (492 M³) economic grade rough blocks will be obtained and 85% (2,790 M³) of waste rock will be realized.

5th Year

In the 5th year the mining will shift to South West of 2nd & 3rd year workings in the grids E 00 – E 10 & N 150 – N 200, North East oriented faces advance further South West maintaining average of 6 M bench height. An area of 600 M² will be covered during this year.

In the fifth year it is planned to produce 540 M³ of economic grade rough blocks. To produce this quantity an area of 600 M² (40 x 15 M) will be utilised. Producing 3,600 M³ of rock from which 15% (540 M³) economic grade rough blocks will be obtained and 85% (3,060 M³) of waste rock will be realised.

YEAR WISE PRODUCTION FOR NEXT FIVE YEARS

Year	Dimensions L x W x Bench Height (M)	Volume (M ³)	Market Grade Rough Blocks @ 15% (M ³)	Waste Generation @ 85% (M ³)
1 st Year	30 x 15 x 6	2,700	405	2,295
2 nd Year	30 x 15 x 6	2,700	405	2,295
3 rd Year	45 x 10 x 6	2,700	405	2,295
4 th Year	547 x 6 (Area arrived with Plano Meter)	3,282	492	2,790
5 th Year	40 x 15 x 6	3,600	540	3,060
Total :		14,982	2,247	12,735
Average :		2,996.4	449.4	2,547

The mine layout for production of coloured granite rough blocks first five years is showed in Plate No. V.

Quantum of Excavation

The deposit occurs as large size boulders exposed on hill, hence no over burden removal is involved, however during production it is estimated that 2,247 M³ of Rock Mass will be removed per year with a total of 14,982 M³ in five years to retrieve 2,247 M³ market grade rough blocks, there by generating 12,735 M³ of waste rock.

6.3 Year Wise development for First Five Years

The deposit in this area is exposed to a maximum height of 60 M from the surface. In the first five year plan period the applicant proposes to produce 450 M³ of Coloured Granite per year. In order to produce this quantity an area of 2.497 M² will be utilized.

6.4 Drilling

Drill hole pattern will be of 3 M depths 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.

6.5 Handing of Blocks within the Quarry

Blocks from mother rock separated by excavator and since the quarry is located on the ridge, the rough blocks will be brought to the dressing yard by poclain.

Transportation of blocks from quarry to yard and to destination

The rough blocks in the mine area handled using poclain and brought to dressing yard. Here, after proper dressing blocks are transported to destination by trucks.

7.0 STORAGE AND HANDLING EXPLOSIVES

Not Applicable (No permission for storing the blasting material will be granted by the District Administration). The applicant proposes to use AGFRACT Chemical Compound whenever required.

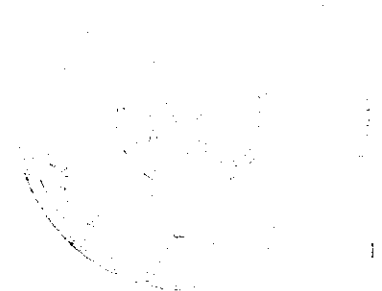
8.0 WASTE MANAGEMENT PLAN

8.1 Solid Waste

Mining of Coloured Granite is general, faces serious problem of generation huge quantity of waste rock. In the area though coloured granite occurs as exposed deposit with loose under sized boulders on the surface. With the closely spaced joints and sheared joints contribute a great extent of waste generation in the form of side burden. Further natural defects like moles, dark patches and veins are present in the rock, effects of blasting also contribute to generation of huge waste material during coloured granite mining.

8.2 Estimated wastage quantities that will be generated over the entire the lease period

At the rate of 2,547 M³ average generation of waste per year for 5 years balance lease period the total volume of waste generated is estimated to be 12.735 M³.



Year	Waste Generated (M ³)
1 st	2,295
2 nd	2,295
3 rd	2,295
4 th	2,790
5 th	3,060
Total :	12,735

8.3 Measures to be adopted for solid waste

- 1) *Reduction of waste at source :*
 - a) Where the defect less and defective bands are distinct in the mine resorting to strip mining may be helpful in reduction of waste.
 - b) Controlled and cushion blasting may be helpful in generation of less blasting waste.
 - c) Employing experienced and skilled workers in the production and dressing of rough blocks may help in generation of less waste rock.
- 2) *Utilitisation of waste if not prevented*
 - i) Separation of over burden and side burden in to different categories such as soil, weathered rock and dumping separately so that:
 - Soil will be used for afforestation
 - Weathered rock if it is sufficiently soft and devoid of rock fragments can be utilized the filling of roads, side ditches, formation of approach roads to quarries, construction works etc.
 - ii) Waste rock of generated during production, blasting and dressing having large and medium sized can be used as break water stones, deep cut streams, river sections, for preventing the soil erosion.
 - iii) Recovery of waste material from the rejected block. Small size rough blocks can be obtained from large size rejected blocks and can be sold in the local market for the tiles etc.
 - iv) Disposal of waste as last resort

The waste, which is useless, has to be removed and stored in separate dumps. Dumping site is year marked between grids East 00 - 50, North 100 - 200 in the South - Western corner of the lease area. (Plate - V).



- v) Use for back fillings the quarried out mines and other landfill operation of a source of road building material etc.:

As the Coloured Granite in this area is an exposed deposit, underlain by thin veneer of overburden and as the life of the ultimate pit level will not be deep enough the waste generated during mining may be sufficient to back filling of the left over quarry. Granite waste generated during production and dressing after reducing to proper size can be utilized in the road construction, etc.

8.4 Liquid Waste

- i) Mine Drainage

The drainage system of mine in this area consists of only of surface run off generated from rainfall. As the deposit forms a ridge, the groundwater occurrence is absent, therefore mine drainage may not be a problem in this area.

- ii) Run off from waste dumps and measures proposed to arrest run off.

Rainfall over the lease area affected differently by waste dumps, mine pits, roads etc. The rain cuts the dumps small raills formed and there by a small amount of run off is generated.

The following measures proposed to arrest surface runoff.

- a) Garland drains around pit and waste dump
- b) Retention wall at the foot of the dump
- c) Growing vegetation on the slopes of the dumps

Excavation drainage ditches all around the quarry to direct surface drainage.

Garland drains proposed around pit to divert the runoff in to natural drainage channels.

Utilization of runoff for general surface use or discharge in to surface drainage networks only after meeting with prescribed discharge standards and further the agricultural purposes on the surface :

Surface runoff general during rainfall event cannot be utilized for the general use, hence through the garland drains proposed runoff will be diverted in to drainage network. Granite mines or dump have no pollutants or toxic substances, hence, no contamination is expected, except siltation

Further no agricultural lands exist surrounding the lease area hence water from the drains cannot be utilized for agricultural purpose

Treating waste - water to obtain the desired quality for industrial use as may be required :

No industries exist in the vicinity of the lease area. Hence no treatment is required for the runoff.



9.0 DESCRIPTION OF GRANITE PROCESSING PLANT

The Licensee doesn't possess Granite Processing Plant.

10.0 MARKET ANALYSIS

i) Assured and expected supply contracts :

During 1994 -1997 mining operations, the licensee has dispatched 578.34 M³ showing the recovery percentage of about 243.491 M³ of economic grade to the Market there by established the marketability of rough blocks from this mine.

ii) Ability to supply consumer in time :

Licensee is having sufficient men and machinery, 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 :

Coloured granite of this is having very good demand in both international as well as in domestic market. The prices of rough blocks of 120 up size ranging between Rs. 20,000 to 25,000 depending upon the colour of the rock.

11.0 ORGANIZATION CHART FOR THE QUARRY AND CAPTIVE PROCESSING PLANT IF ANY AND AT THE CORPORATE LEVEL

The organogram of the quarry in this area is as follows :

The Company employed the following

1. Mines Manager	-	1 No.
2. Supervisor	-	1 No.
3. Skilled Workers	-	10 No's.
4. Semi-Skilled Workers	-	12 No's.
5. Labour	-	10 No's.

Site Services

Office, Rest Room, Store Room, First-Aid Room & Drinking Water are existing at the Quarry Site.

12.0 ENVIRONMENTAL MANAGEMENT PLAN

12.1 Baseline Information

i) Existing Land Use Pattern

The applied area is a part of hill land, sloping due South East. The whole land is covered by sparse vegetation. The soil existing in the applied area is bouldery and unfertile. The deposit is exposed to a maximum height of 60 M above ground level in the North Western portion of the lease area and occupies entire quarry lease area. The entire Hill is active with quarrying. The plain areas around the hill are agricultural lands.

ii) Water Regime

No Streams or Drainage lines exist in Quarry Lease area excepting the sheet flows during the rainy days. Drainage is well developed around the hills in general, all these streams developed on the hills culminate in the tank located 2.5 Km West of Tekkali Town & Mandal HQ's.

iii) Flora and Fauna

The whole area is occupied by scattered 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 population, since 50 years.

iv) 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.

v) Human Settlement

The village Gopalapuram is situated 2 Km due South East of the quarry lease area. The population of this village is about 500. The village is surrounded by agricultural lands. The details of the villages in 2 Km, surrounding from the applied area is given in following table.

Table No. II : Human Settlement (Plate No - I)

S. No.	Village	Direction	Distance (Km)	Population
1.	Gopalapuram	South East	2	500
2.	Kothuru	North West	1.2	500
3.	Bheempuram	North West	2	500
4.	Dubbaguddi	North	1	300
5.	Sidipeta	South West	1.75	300

The main occupation of the local population is agriculture and sheep raring / Breeding.

vi) Public Building, Palace and Monuments

No of public buildings, palaces and monuments are witnessed in and at the vicinity of the area.

vii) Quality of Air and Water

The air and water of the area are free from any kind of pollution, since no industries are established in the area. The Mining in the area gives rise to dust. But as the mining is confined to Hill, Hence pollution is limited.

viii) Whether the area falls under notified area under water act. 1974

The area will not fall under notified area under water Act. 1974.

12.2 Environmental Impact Assessment

i) Landscape Changes

The mineral deposit. Is exposed, raising with a maximum height of 60 M above ground level. In 5 years plan period it is proposed to produce 2,247 M³ of rough blocks. To meet this production an area of 2,497 M² will be utilized. The mining will alter the shape of the present hill with the escarpments of 6 M.

ii) Aesthetic Environment

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

iii) Soil and Land Use Pattern

The soil is embedded in the interstices of boulders. However, soil mixed with boulders, which are unfertile, is deposited along the southern margin of the lease area. Hence, the land is not being used for agriculture purpose. Therefore the mining in this area will initiate utility of the land.

iv) Agriculture

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

v) Forest

The applied area is not coming under forest zone. However, the applicant is proposing to undertake afforestation in the area.

vi) Vegetation

The applied area is covered with scattered vegetation of small shrubs, herbs and thorny bushes. However, no cutting of trees is involved in mining activity.

vii) Water Environment

No Streams or Drainage lines exist in and around Quarry Lease area.

viii) Air Environment

a) Noise

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 muffers etc.) The machinery will be properly maintained.

b) Air

The mining in this area does not involve any dust creation. The air pollution occurred due to transportation in summer season would be suppressed by sprinkling the water on the roads and the dust generated while drilling will be suppressed by cloth covering the drill rods and dust extractors will be deployed.

ix) 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.

x) 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.

xi) Human Settlement

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

xii) Recreational Facility

The surrounding villages people will go to Tekkali Town for purchases, medical & recreation.

12.3 MANAGEMENT PLAN

1. Soil Conservation Methods

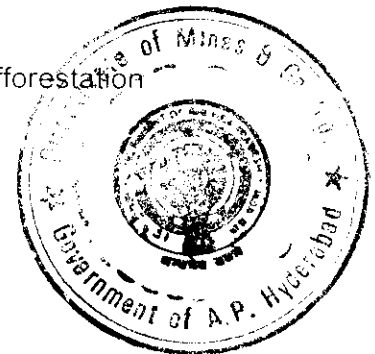
The soil is embedded in the interstices of boulders. This will be dumped all along the buffer zone for afforestation in the southern boundary

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

Even after 5 years the hill remains except the reduction of elevation and slopes by the escarpments 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

AIR QUALITY

Base Level	Alloable Level
SPM = 140 $\mu\text{g}/\text{m}^3$	360 $\mu\text{g}/\text{m}^3$
RSPM = 60 $\mu\text{g}/\text{m}^3$	120 $\mu\text{g}/\text{m}^3$
SO ₂ = 40 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$
NO ₂ = 40 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$
CO = 1.0 $\mu\text{g}/\text{m}^3$	5.0 $\mu\text{g}/\text{m}^3$

- The mining will not involve dust rising methods. The dust anticipated during dry seasons, by transportation on road will however be suppressed by sprinkling water on roads. For this purpose, tractor mounted sprinklings will be deployed at this place.
- The dust rises during blasting will be negligible because of less production and rare blasting.
- The mining in the area gives rise to dust. But as the mining is confined to Hill. Pollution is limited.
- The drill rods will be covered with the cloth to suppress the dust. Dust extractors will also be deployed.

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

No explosives are used.

Noise

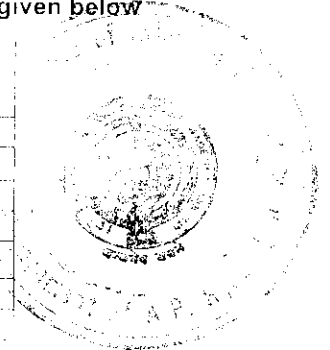
The noise generated by compressors, drilling & machinery like Proclaim / Excavators and Tippers will be high. The workers in the quarry area will be provided suitable headgear and noise reducing protective gear (like Cotton Mufflers etc.)

The noise levels for various activities are

1. Compressor - 84 to 98 dB(A)
2. Tipper Empty- 88 to 91 dB(A). Tipper Loaded - 95 – 103 dB(A)
3. Proclaim - 90 to 96 dB(A)
4. Blasting - 89 to 95 dB(A)

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



The lessee for protecting will maintain suitable precautions. The workers by providing suitable protective gear. And the machinery will be properly maintained.

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

Granite Mines does not require beneficiation.

- 7. Measures for minimising adverse effect on water regime

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

- 8. Afforestation Programme

Since the entire Quarry Lease area is occupied by the deposit excepts small part in the southern border of the applied area with soil mixed with boulders is deposited Afforestation program is proposed in this region by planting suitable type with 2 M spacing. (Plate V).

- 9. Preparation of dumping ground for stacking toxic mineral substance

No toxic minerals are present

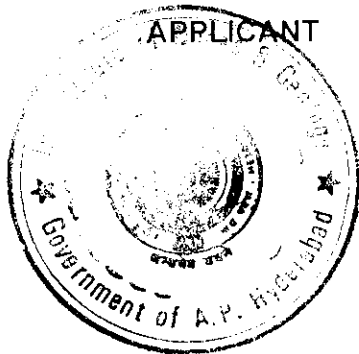
13.0 ANY OTHER RELEVANT INFORMATION

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, Indian explosive act, Payment and Wage act, Workmen Welfare act, Employees Provident fund act shall be adhered.

This Mining Plan Is Approved subject to the Conditions/Stipulations Indicated in the Mining Plan Approval Letter No..... 22689/MP-1/2004 dated 9-9-2004

b. b. b. b.

[Signature]
RQP



APPROVED

(V.T. CHANDER)

[Signature]
Dr. P. DAYASANKAR
DIRECTOR
DEPT. OF MINES & GEOLOGY
GOVT. OF A.P. HYDERABAD.

ANNEXURE - I

GOVERNMENT OF ANDHRA PRADESH
DEPARTMENT OF MINES AND GEOLOGY

PROCEEDINGS OF THE ASST. DIRECTOR OF MINES AND GEOLOGY,
SRIKAKULAM.

(Present: Sri P. Sanyasi Naidu, B.Sc., Assistant Director)

Proceedings No. 1849/0/93.

Dated: 27-7-93.

Sub: Mines and Quarries - Quarry Lease for colour granite over an extent of 4.00 Hectares in S.No.1 of Addukonda Village, Tekkali Mandal, Srikakulam District - Granted in favour of M/s Reliance Granites (P) Ltd - Execution of lease deed - Work Orders - Issued - Regarding.

- Ref: 1. Proc. No. 1351/Q1/93, dated 14.5.93 of the Dy. Director of Mines and Geology, Visakhapatnam.
2. Letter No. No. 1677/B4/93, dated 10.4.93 from the Collector, Srikakulam.
3. Letter dated 27-7-93 from M/s Reliance Granites (P) Ltd., Hyderabad.
4. Proc. No. 19831/K1/93, dated 30.6.93 of the Director of Mines and Geology, Hyderabad.

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ORDER:

The Quarry Lease granted in favour of M/s Reliance Granites (P) Ltd., Hyderabad for colour granite in S.No.1 of Addukonda Village, Tekkali Mandal, Srikakulam District over an extent of 4.00 Hectares for a period of 15 years has been executed on 27-7-93 by the undersigned. The Quarry Lease is valid for a period of 15 years from 27-7-93 to 26-7-2008.

M/s Reliance Granites (P) Ltd., Hyderabad 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 9.7.92 and subsequent instructions issued on the matter from time to time. The lessee should submit the quarterly returns and the progress in cutting and polishing unit to the concerned District Industries Centre, the Assistant Director of Mines and Geology, Srikakulam, the Deputy 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 Reliance Granites (P) Ltd.,
Plot No. 33, Hindi nagar,
Panjagutta, Hyderabad-34

- submitted
Copy to the Director of Mines and Geology, Hyderabad for favour of information.
Copy submitted to the Dy. Director of Mines and Geology, Visakhapatnam for favour of information.
Copy submitted to the District Collector, Srikakulam for favour of information.

Contd.....2



Copy to the District Development Officer, Srikakulam.

Copy to the Revenue Divisional Officer, Tekkali.

Copy to the Mandal Revenue Officer, Tekkali.

Copy to the Mandal Development Officer, Tekkali.

Copy to the Sarpanch, Addukonda Village, Tekkali Mandal,
Srikakulam District.