
FEASIBILITY REPORT

1. INTRODUCTION OF THE PROJECT/BACK GROUND INFORMATION

Sri.No. Farid Basha, Proddatur, possess a mining lease for Quartz mineral over an extent of 149 Hectares in S. No 01 of Thumukunta Village, Galiveedu Mandal, Y.S.R. District, Andhra Pradesh. The Mining Lease was granted vide G.O Ms. No. 42 of Ind & Comm (MIII) Dept, dated 06/02/2009 for 20 years and executed vide proceedings No. 2818/M3/2007 dated 07-01-2010 valid upto 04-01-2030. And obtained EC vide F.No.J-11015/53/2009-1A.IIM Dated: December 8,2009.

Subsequently, the Lessee has applied for transfer of mining lease on 03-03-2014. The mining lease was transferred to **M/s. Rayalaseema Quartz Pvt Ltd.**, vide proceedings No. 138/TML/2013 dated 04-03-2014 .The transfer of Mining lease was executed on 04-03-2014 for the unexpired portion of the lease period i.e., upto 04-01-2030. The present directors of the company are Sri.K. Nageswara Rao & Smt K. Sunitha. The company resolution copy is enclosed.

The present Managing Director, Sri K. Nageswara Rao has vast experience in the mining field since 20 years and has good financial capability including mining machinery which is required for mechanized mining operations. Before expiry of the mining scheme period the lessee as applied for modified mining plan for increase in production for one year period i.e, 2014-2015 of the approved mining plan period. The scheme of Mining is prepared for 2017-2018 to 2019-2020 i.e, 3 years and is submitted under Rule 7 (A) of AP Minor Minerals Rule 1966 (G.O.Ms.No. 56, Industries and commerce (Mines-II) 30th April 2016).

The company has prepared the mining scheme for a production of 3.05 million tons enhancing the production from 50,000/- TPA. The increase in the production is due to change in the use of minerals as a Premix in Cement and for construction as Quartz sand apart from its use in Metallurgical industry.

The lease area is found to have prominent exposures of Quartz covering most of the Mine lease area. Detailed exploration has been carried out by the Lessee by drilling boreholes to know the continuity of the Quartz body and also the quality, which is explained in the Mining scheme. In view of the proposal for development and production of Quartz , the lessee intends to produce 30,42,725 TPA by carrying out medium scale mining by engaging machinery i.e. Semi-mechanized Open cast method of mining.

Need for the project:

Based on the demand for Quartz, the Company intends to increase the production to meet their required quantum of Quartz. As per EIA notification 2006 project proponent is submitting the proposal to obtain Environmental Clearance for enhancement of production to 30,42,725 TPA of Quartz from MoEF&CC, GOI, New Delhi.

Employment Potential:

The proposed Manpower is around 150 including a I class Mines Manager, Mining Engineer, Safety officer, Geologist, Foreman and other Staff. About 150 peoples will be assigned job relating to the drilling, excavation, loading and transport of the quartz mineral and waste. The Mine shall provide indirect employment for 150 people. The working hours at the mines will be 8 hours/day for 300days/year in a single shifts.

2. PROJECT DESCRIPTION

The Mine Lease Area (MLA) is located between North Latitude $14^{\circ} 03'9.7''$ to $14^{\circ} 03'55.3''$ and East Longitude $78^{\circ} 27'17.1''$ to $78^{\circ} 28'17.3''$. The project site and 50% of its 10kms buffer zone falls in the Survey of India Toposheet No. 58 J/B. The MLA is in the form of three consecutive Mounds/ hills. The area is devoid of any forest or tree cover. It comprises shrubs only.

There are no prominent natural drainage channels in the area. In general the drainage pattern is dendritic and there are no conspicuous nallahs.

The Other details are given below:

Toposheet NO.	58 J/B
Latitudes	$14^{\circ} 03'9.7''$ to $14^{\circ} 03'55.3''$
Longitudes	$78^{\circ} 27'17.1''$ to $78^{\circ} 28'17.3''$
Survey No. & Villages	01 –Thumukunta village
Mandal & District	Galiveedu Mandal, Y.S.R. District
Extent Area	149 Ha.
Type of Land	Govt. Revenue waste Land
Road Connectivity	A Bitumin Topped road of 2.5 km length is connecting the area to Thumukunta village
Nearest Railway station	38 Kms of Kadiri is the nearest Railway Station
Method of Quarry	Semi Mechanized Opencast quarrying

LOCAL GEOLOGY: The Quartz of the subject area is a tabular body intruded within the Vellagallu schist belt and exposed on peak of the hills/mounds. Four mounds were formed along the ridge of the schist belt and four discontinuous quartz bodies/veins were exposed on top of the mounds in the strike direction of NW-SE. Out of these four mounds, the SE mound is the more prominent ore and the Quartz vein is exposed as vertical wall to a width of 60m and height of 36m (max) on top of this mound. As the quartz body traverses from SE to NW it reduces its height and width to 5m & 40m respectively.

Quartz: Quartz occurs as semi glassy variety on SE side and it turns as granular Quartz on NW side of the area. It is fine to medium grain size. It is white in colour. But, at some places it appears in brown colour due to surface weathering. It has well developed joints.

Schist: Sporadic outcrops of the schist can be seen on the slope of the hills and as well as in nala cuttings of the area. It is gray in colour and it does not have any economic importance.

Soil: Red soil with scree is covering the slopes of the applied area on either side of the quartz vein to a thickness of more than 1.0m.

Excavation:

Mine development: Year-wise proposed & achieved development details are given below

Year	Proposed in tones	Achieved in Tonnes
2010-2011	6250	500
2011-2012	5482	600
2012-2013	5482	600
2013-2014	5400	800
2014-2015	5550	650
2015-2016	Nil	3000
2016-2017	Nil	4000
Total	28,164	10,150

Exploitation: The proposed and achieved production of White Quartz with, as given below:

Year	Proposed in tones	Achieved in Tonnes
2010-2011	56,520	2233
2011-2012	49,342	2163
2012-2013	49,342	2080
2013-2014	48,600	4337

2014-2015	49,950	3100
2015-2016	Nil	15,650
2016-2017	Nil	29,650
Total	2,53,754	59,063

MINERAL RESERVES: The reserves are tabulated below:

Category	Quartz in Reef, Tons	Quartz in Float Tons	Total Qty in Tons	Under UNFC
Proved	24459175	7076165	31535340	111
Probable	10888995	-	10888995	122
Total	35348170	7076165	42424335	

TOTAL MINERAL RESERVES: white quartz reserves & resources

Category	Quartz in Reef, Tons	Quartz in Float Tons	Total Qty in Tons	Under UNFC
Proved	24459175	7076165	31535340	111
Probable	10888995	-	10888995	122
Resources Blocked	2098076	222700	2320776	221
Total	37446246	7298865	44745111	

The Total mineable geological reserves are as follows:

Total mineable reserves 44745111 Tons

Proposed max production/annum 30,42,725 Tons

Total life of the mine is $44745111/30,42,725 = 14.70$ or say 15 years

After the proposed exploration during scheme period the dimensions of the quartz vein and the reserves will be re-assessed and the life of the mine will be changed as per the re assessed reserves.

Projected productions of ROM and Marketable blocks during the plan period-

PRODUCTION			
Year	White Float Quartz	White Reef Quartz	Total Quantity in Tonne
2017-2018	1719975	1220394	2940369
2018-2019	1322175	1630200	2952375
2019-2020	877200	2165525	3042725
Total	3919350	5016119	8935469

Method of Quarry:

The mining was carried out by Systematic & Scientific method. Now the method of mining is proposed for fully mechanised open cast method. A bench height of 10m is proposed. Drilling and blasting will be required for the quartz. The quartz and waste are removed by hydraulic shovel/wheel loaders and loaded into tippers and total ROM is transported to plant. The bulk density of quartz is considered as 2.5 Tons/Cu.m. The recovery is physically verified after processing and weighing and found to be 95% of ROM.

Solid Waste Management:

The total waste handling in the next 3 years will be about 14,02,596 cu.m and this waste material will be dumped in float worked out area on the north and south side slope of reef area. At the foot of the waste dumps retaining walls will be constructed to avoid surface runoff and spillage of waste material from lease area. The same dumps will be stabilized concurrent to mining operations. Check dams and gully plugs will be constructed in the foothills of nalahs. The table below shows the proposed development for the successive block of 3 years:

Blocks of five years	Proposed Development in tonnes
Ensuing plan period	
1 st Block (2017-18 to 2019-20)	2805190
2 nd Block (2020-21 to 2024-25)	1000000
3 rd Block (2025-25 to 2029-30)	1000000

The waste rock consists of schist rock and intercalated waste. Presently this intercalated waste will be disposed off in slope side in the float worked out areas towards northern and southern side within the mining lease area ear marked for the purpose.

Hydrology:

In the Quarry lease there is one borewell and it is used for drinking purpose and it can be stored in tanks. The analysis of this borewell water is done and the parameters are within the permissible limits. The surface water is in the form of seasonal rainfall and the ground water bodies are encountered below 50-60 m depth in the area, from the surface. In the absence of soluble minerals like sulphides in the mineral, there shall not be any kind of acid mine drainage.

3. SITE ANALYSIS

Topography: The terrain is hilly and undulating. The highest & lowest elevation of the M.L area is 355m & 548m. Except, some thorny bushes in isolated patches, the area is mostly devoid of any thick vegetation. The Mine is about 2.5 km from Thumukunta. The quartz produced from mine will be dispatched to domestic market. The subject area belongs to a ridge which is elongated in NW-SE direction. The area is elevated in the middle and steeply sloping towards NNE-SW. There are no perennial water courses in the area. Since the area is barren land it does not have much vegetation or trees except some scattered thorny scrub on the slopes of the mines lease area.

Existing Infrastructure:

The construction of temporary structures for Mines office, Rest shelter, First aid station, sanitation & etc., are provided in the non mineralized area of Quarry lease.

The details are collected from the core and Buffer zone of the lease. The Drinking water, electricity and primary education facilities are available in almost all the villages. The Police Stations, Post Offices, Dispensary facilities, Phones, College, and Railway station are present in Mandal and District head quarters of YSR Kadapa district. There are good all weather roads present in the buffer zone of the Mine Lease Area. State highway is passing through major towns and near by villages. No Sensitive areas for ecological reasons are present within 10 kms.

4. PLANNING BRIEF

Conceptual Quarry Plan:

The entire strike length of the deposit of the Quartz bodies, running parallel are exposed & the mine is working forming benches of 5.0 mtrs height with a general pit slope of 45°. The ultimate pit limit is marked as shown on the Geological Plan & Sections. Conceptual plan period production & development details as furnished in the Conceptual Mine Plan. However, when the Quartz is proved to its full depth, the conceptual plan will be duly modified. Dumping will be done in the worked out pit area within the lease area. At the end of the Conceptual Period complete dumps will be afforested and wherever possible and along road sides afforestation will be carried out. Safety bunds, fencing & retaining walls shall be constructed as per the directions and guidelines of Directorate General of Mines Safety.

Population Projection:

The man power of mines includes Mines manager, Engineer, Geologist, skilled and unskilled Labours and medical officers etc. Due to the mining activity nearby villagers shall get direct employment as skilled unskilled labour apart from the qualified persons. The direct employment envisaged from this activity is for about 150 persons. The proposed Quarry activities also shall bring the positive change in the villages as the mine shall provide indirect employment to more than 100 people.

Afforestation:

Afforestation has already been taken up on a large scale in the buffer and non mineralized area. The afforestation taken up provides the requisite floral biodiversity. At the end of the conceptual period filled dumps will be afforested and wherever possible and along roadsides afforestation will be carried out. About 1500-2000 saplings on an average consisting of Neem, Teak will be planted per year over an area of 50m x 6m at 3m grid interval. Details of the afforestation program are given below:

PROPOSED PLANTATION			
Blocks of five years	No. of saplings proposed to plant	Proposed to be covered in Hect.	Location/Remark
1 st Block (2017-18 to 2019-20)	1500	1.50	Lease periphery & Inactive dumps
2 nd Block (2020-21 to 2024-25)	2500	2.50	Lease periphery & Inactive dumps
3 rd Block (2025-25 to 2029-30)	2500	2.50	Lease periphery & Inactive dumps

Assessment of Infrastructure Demand:

The existing road network will be sufficient to meet the proposed production capacity. However, required infrastructure for transport within the leasehold area will be further strengthened and improved. No new routes or alternations are required in this regards.

Amenities/Facilities:

Lessee proposes to employ about 150 persons. This employment has a positive impact on the socio-economic conditions of the surrounding areas as most of the work force employed will be from the nearby areas. Local persons will be hired for meeting the requirement of trucks loading, plantation, construction of check dams, retaining walls etc.

The following are the benefits due to Quarry to the local population:

-  Direct and indirect employment opportunities.
-  Improved road and communication network.

5. PROPOSED INFRASTRUCTURE

An extent of lease area of 149 Ha., Government barren land is recommended for Quartz mining. The proposed method of mining is proposed for Semi mechanized open cast method. A bench height of 10m is proposed. Drilling and blasting will be required for the quartz. The lease area does not have any public roads, railways lines, telephone lines, public buildings etc.

Present infrastructure will meet the requirement of the project. The conditions of the roads in the buffer zone are unlikely to be impacted due to the proposed small scale expansion. The project authorities in association with the adjacent mine/quarry owners & district administration will also contribute to development & maintenance of roads.

Green belt Development:

It is proposed to develop a green belt of the portion of the non mineralized areas and in addition, the place around the haul road and slopes of the dumps shall have plantation. Every year it is proposed to carry out afforestation by planting about 1500 saplings within & about 1000 saplings outside the lease area. The species chosen for green belt are fast growing with good canopy and dense leaf density, and some ornamental plants to give good aesthetic look. Varieties like Neem, Teak, Tamarind, Subabul, Rain tree, Badam, Ficus will be used to develop green belt in the surrounding & Quarry area. More emphasis will be given for planting local species. Each year some part of the 7.5 m barrier zone will be subjected to afforestation and care will be taken to protect the sapling. Fruit growing trees are proposed to be planted.

Drinking Water Management:

There are no Water courses within or adjacent to the quarry lease and hence there is no possibility of disturbance & rainwater will continue to flow in the same direction as it is in existence. Since the water is not withdrawn (from any sources outside the lease area) for Mining purpose, no adverse impact is foreseen on the existing water regime. The rainwater stored in the pits shall be utilized for mitigating dust and other activities.

The surface water in the buffer zone is in the form of seasonal rainfall and the ground water bodies encountered below 50-60 m depth in the area from the surface level. The area is small, and no hydrological study has been carried out in the Mine Lease Area. There is no hazard of acid mine drainage. The drinking water is available from nearby bore wells and water can be stored in tanks. During the course of Quarry operation no diversion of water course is considered as it doesn't exist.

Sewerage System:

The existing watercourses shall not be disturbed and rain water will continue to flow in the same direction. Check dams have been constructed by the side of the O.B Dumps, water will percolate in the premises of the mines area. There is no generation of domestic sewage.

Industrial Waste management:

There is no generation of affluent/toxic substance; hence treatment of mine water doesn't arise.

Solid waste management:

There is little top-soil in the Quarry area proposed. As such there is no generation of waste, whatever little is produced may be of low grade Quartz and intercalated waste to the tune of 10%, is being dumped and some portion of material is used to make road & bund around the lease area. Defective Quartz produced shall be stacked separately and marketed for metallurgy industry as and when the demand arises. No toxic or hazardous elements are reported in the waste & hence, no effect on the surface/ground water.

Power requirement and Supply:

There will not be any requirement of power supply to the project site. The Quarry activities are envisaged to be carried out only during day time by machine drilling and deployment of machinery for excavation, loading and transportation.

6. RECLAMATION & REHABILITATION

Surface mining will alteration in the topography of the area by way of excavation and surface dumps. This will lead to water pollution, silting of agricultural lands, air pollution etc. The primary objectives of reclamation are to restore the affected area to the original state as near as possible.

The various reclamation proposals planned during the plan period as well, rest of the Quarry period such as broad working benches with safe angle of slope, stabilization of dumps, installation of effective drainage system, prevention of erosion and excessive run off, & Revegetation or afforestation.

As far as Quarry area is concerned, so far none of the proposed Quarry area is matured or completely exhausted. Hence, the measures like Retention walls, drainage system and afforestation works etc., shall be taken up.

7. PROJECT SCHEDULE AND COST ESTIMATES

The estimated total cost of the project is Rs. 30.00 crores. The land belongs to the government i.e. revenue land including the cost of the machinery and additional preliminary works and working capital i.e. for the application and processing fee, etc ,.

The return on the investment is by way of sale of mineral. All the minerals shall be marketed. The machinery shall be purchased or shall be deployed on hire basis as per the requirement for production.

The proposed production of Quartz is 30,42,725 TPA . The major components required to project the financial status of a project are

-  Cost of the project
-  Means of financing
-  Cost of production
-  Tax burden and flows
-  Profitability

➤ Cost of the Project

The cost of the project consists of the following major components:

-  Land and site development
-  Buildings and civil works
-  Machinery
-  Processing charges and Consultancy charges for preparation of Quarry Plan, Environment Monitoring for generation of baseline data, EIA & EMP report, Public Consultation and other clearances and approvals.

✎ Provision for contingencies

✎ Margin money for working capital

S. No	Activity	Quantity	Recur. cost/ annum (Rs)
01	Afforestation work	2500 sapling/annum	25,000
02	Retaining wall	100 mtrs/annum	15,000
03	Check dam	01/annum	55,000
04	Dust suppression	15,000 lts/day	3,00,000
05	Environmental & Mitigative measures	Annual	1,00,000
06	Miscellaneous	Annum	3,00,000
Total			7,95,000

The total estimated cost of the project is Rupees 30.00 crores. The Quarry lease area is Government Revenue Lands.

Water Requirement:

Water consumption is around 50 KLD. The water source is outside the lease area for water requirement.

Cost of Production:

The maximum proposed production of Quartz during the first five years is around 30,42,725 TPA . The cost of the production includes the following components:

Parameters:

- 1) Mineable reserves – 44745111 TPA
- 2) Nature of ore – Quartz
- 3) Production: Quartz – 30,42,725 TPA

A) Direct costs of Quarry

Sl.No.	Particulars	Expenditure	Cost/Tonne Rs.
1	Production cost	Excavation cost & transportation	270.00
2	Power, water & fuel	Annual power, water & fuel	65.00
3	Development, repairs & maintenance cost		30.00
4	Royalty to Government		115.00

5	Admin & Miscellaneous expenses	50.00
	Total	530.00

B) Environmental Costs

Sl. No.	Particulars	Expenditure	Cost/Tonne Rs.
1	Air pollution control	Rs. 2,00,000	0.06
2	Environmental protective measures	Rs.3,00,000	0.09
3	Green belt / Afforestation	Rs.5,00,000	0.16
4	Miscellaneous	Rs.50,000	0.01
	Total	Rs. 10,50,000 i.e Rs.0.32/Tonne	

C) Health and Safety:

Sl. No.	Particulars	Expenditure	Cost/Tonne Rs.
1	Medical facilities	Rs. 50,000	0.06/Tonne
2	Health Check up & Medicines	Rs. 55,000	
3	Safety	Rs. 75,000	
	Total	Rs. 1,80,000	

D) Socio Economic:

Sl. No	Particulars	Expenditure	Cost/Tonne Rs.
1	Education i) School books, uniforms conveyance to school ii) Scholarships iii) Repairs & maintenance of school buildings	Rs. 3,00,000	0.09
2	Health camps	Rs. 50,000	0.01
	Total	Rs.3,50,000	Rs. 0.1

E) Capital cost Rs.30.00 Cr.

Total pit head cost per tonne of Quartz /tonne	:	Rs.530.00/-
Pit head realization for Quartz /tonne	:	Rs. 750/-
Profit/tonne	:	Rs. 220/-
Gross profit/annum for 30,42,725 TPA	:	Rs.6694 lakhs

Income Tax @ 35%	:	Rs. 2343 lakhs
Net profit after taxation @35%	:	Rs. 4351 lakhs
Profit/Tonne	:	Rs. 143/ton

8. ANALYSIS OF PROPOSAL (FINAL RECOMMENDATION)

M/s. RAYALASEEMA QUARTZ PVT.LTD., is proposed for annual production of 30,42,725 TPA of Quartz . The financial estimates reveal very high rate of returns. The project is economically viable. The estimates have also taken into consideration the occupational health expenses, environmental protective measures, social welfare activities etc., The Form-I and Mining Plan are submitted with this document.



Date: 18-08-2017
Place: Bangalore

**Signature of the applicant with
Name and Full Address
(Project Proponent /Authorised Signatory)**
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