DISTRICT SURVEY REPORT (DSR)

OF

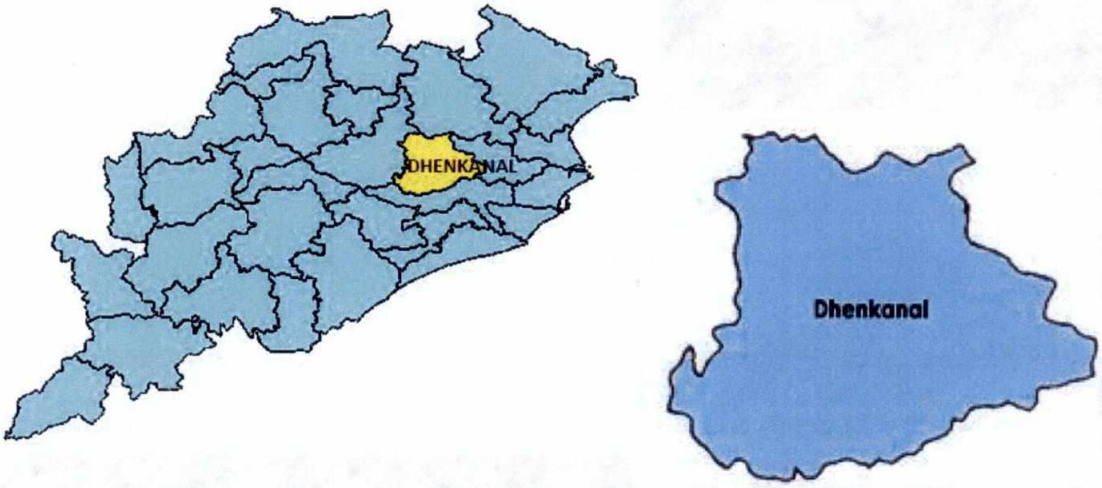
DHENKANAL DISTRICT, ODISHA

FOR

QUARTZ & QUARTZITE

(FOR PLANNING & EXPLOITING OF MINOR MINERAL RESOURCES)

ODISHA



As per Notification No. S.O. 3611(E) New Delhi,
25th July, 2018
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(MoEF & CC)

COLLECTORATE, DHENKANAL

OFFICE OF THE COLLECTOR & DISTRICT MAGISTRATE, DHENKANAL.
(TOUZI SECTION)

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No. IX-19/2019- 8081 /Touzi. Dated 24.12.19

Proceedings of the meeting of DEIAA, Dhenkanal held on 24.12.2019 at 4.00 P.M. in the Office Chamber of the Collector & District Magistrate, Dhenkanal.

A meeting was convened on 24.12.2019 at 4.00 P.M. under the Chairmanship of the Collector & District Magistrate, Dhenkanal-cum-Chairperson, DEIAA, Dhenkanal for approval of District Survey Report in respect of Dhenkanal District for grant of Environmental Clearance for specified/other than specified minor minerals. The members present in the meeting is at Annexure-A.

At the outset, the SDM & Sub-Collector, Dhenkanal-cum-Member Convener, DEIAA welcomed all the members and placed the District Survey Report (DSR) for Quartz and Quartzite prepared for the district, before the DEIAA for discussion and approval.

In pursuance of Notification No.S.O.3611(E)/Dtd.25.07.2018 and the amended Notification No.S.O.3977(E)/Dtd.14.08.2018 of MoEF & CC, Govt. of India, the sites having probable potentiality of minor minerals were duly visited by the Tahasildars of the district and the RQP. Basing on the field visit report, the draft District Survey Report had been prepared and published in the district's website for twenty-one days vide District Office, Dhenkanal L.No.6271/Touzi/Dt.22.10.2019 inviting objections/comments thereon. Again the objection period was extended from 11th Nov,2019 to 18th Nov,2019 with due permission.

Accordingly, 7 No.s of objections were received from different quarters. Further, revised reports seeking modification in the draft DSR were also received from various departments.

As per the objections/comments received within the objection period, the same were considered through joint field visit by the Tahasildars and RQP and

Contd....P/2.

incorporated in the final District Survey Report following the guidelines as prescribed in the notification of MoEF & CC, Govt. of India.

After a threadbare discussion, the draft District Survey Report (Final) of Dhenkanal District for Quartz and Quartzite in respect of Dhenkanal District is hereby approved.

The meeting was ended with vote of thanks to the Chair and members of the DEIAA, Dhenkanal.

24/12/19

SDM & Sub-Collector, Dhenkanal-cum-Member Convener, DEIAA,

24.12.2019

Sri Nilamani Maharana, Member, DEIAA, Dhenkanal

24.12.19

Divisional Forest Officer, Dhenkanal, Member, DEIAA, Dhenkanal

24/12/2019

DM & Collector, Dhenkanal-cum-Chairperson, DEIAA, Dhenkanal

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PREFACE

In compliance to the notification issued by the Ministry of Environment and Forest and Climate Change Notification no. S.O.3611 (E) New Delhi dated 25-07-2018, the preparation of district survey report of quartz and quartzite mining has been prepared in accordance with Clause II of Appendix X of the notification. Every effort has been made to cover quartz and quartzite mining locations, future potential areas and overview of quartz and quartzite mining activities in the district with all its relevant features pertaining to geology and mineral wealth. This report will act as a compendium of available mineral resources, geological set up, environmental and ecological set up of the district and is based on data of various departments like Revenue, Water Resources, Forest, Geology and Mining in the district as well as statistical data uploaded by various state Government departments. The main purpose of preparation of District Survey Report is to identify the mineral resources and developing the mining activities along with other relevant data of the District.

1. INTRODUCTION

Centrally located on the Geo-Political map of Odisha, Dhenkanal district is surrounded by beautiful wild lives and forest. The district is situated on the Cuttack-Sambalpur road (NH 55) and on the Cuttack-Sambalpur or Baranga-Sambalpur railway line. The Dhenkanal district touches the boundary of Keonjhar district on its north, Cuttack district on south and bounded by Jajpur district on the east and Angul district on its west. It is commonly believed that the Dhenkanal district owes its name to a Savara chief named 'DHENKA' who formerly ruled over in this tract. Dhenkanal district covers an area of 4950 Sq Km. It has a vast area covered with dense forests and a long range of hills. This is the reason of calling the district as 'Home of Elephants and tigers of the country'. The district lies between 85 degree 58' E to 86 degree to 02' E longitude and between 20 degree 29' N to 21 degree 11' N latitude. Dhenkanal district has a moderate climate. The District experiences hot with high humidity during April and May and cold during the winter months, i.e. December and January. The monsoon generally breaks during the month of June with the average annual rainfall being 1421.1 mm. As far as agriculture is concerned, the district produces a substantial agricultural yield and paddy, ground nut, cashew

nut, potato, mango, jackfruit, sugarcane and some vegetables being its primary agricultural products.

2. OVERVIEW OF MINING ACTIVITIES IN THE DISTRICT.

Dhenkanal district is enriched with some valuable economic minerals like coal, chromite, Kyanite, china clay, semi-precious stone, decorative and dimension stone and graphite.

Coal:

Brahmani Block of Talcher coalfield covers 13.1 km^2 area around Khalpal, Paramhanspur and Ramachandrapur villages. Seam I & II belonging to Karharbari and Barakar Formations are known to occur in this block 58.9 million tonnes of F to B grade coal has been estimated in this block.

Chromite:

Chromite occurs around Kathapal, Sendhasar (Dandakota) Samal, Tangarpada, Lokanathpur, Mahulpal, Badamuktaposi, Bamuan, Godachhak, Jamunakot, Mohulabhanj hill, Bhuasuni hill, Asurabandha, Tulasiposi etc. of Kamakhyanagar sub-division in Dhenkanal district. About 0.589 million tonnes of chromite has been estimated at Kathapal. Analysis of samples collected from pits, trenches and dumps (other than Kathapal area) revealed the presence of chromite. The Cr_2O_3 content varies from 28.6% to 58.75%. SiO_2 varies from 3.20% to 43.30%. Reserve of the above areas has not been estimated to far. Presence of chromiferous bands in quartzite and ultrabasics is also reported from Ghuturigaon and Umundira villages of Kamakhyanagar sub-division. Geo-chemical analysis of soil samples of these areas indicated presence of chromite (about 1% Cr_2O_3) in the soil.

Kyanite:

Important Kyanite occurrences are reported around Torodanali, Kodabasanta and Jhilli. The Al_2O_3 and Fe_2O_3 content of Kyanite varies from 20% to 61.11% and 5% to 26.6% respectively. SiO_2 varies from 31.46% to 69.0%. Reserve of Kyanite has been estimated at 0.64 million tonnes in these areas.

China Clay:

China clay occurrences in shape of small pockets has been located at Karanda, Babandha and Dudurkot I Hindol sub-division of Dhenkanal district. The percentage of Al_2O_3, SiO_2 and Fe_2O_3 vary from 11.4 to 14.3, 18.22 to 23.6 and 5.6 to 7.2 respectively. These are not suitable for refractory industries.

Decorative and Dimension Stones:

Decorative and Dimension stones of economic importance are reported around Karanda (granite gneiss), Babandha (Augen gneiss), Haripur (Charnockite) Kukuta (Augen gneiss) of Hindol sub-division and Latadeipur. Radhadeipur (granite gneiss) of Dhenkanal sub-division. 25,8000 cubic metre of dimension stone has been estimated in these area.

Graphite:

Occurrence of graphite has been located around Karabira and Bandhabhuin villages of Hindol sub-division. The low grade disseminated variety of graphite in migmatised khondalite located 250 metre east of Karabira village extends over a length of 250 m with average width of 100 m. The fixed carbon content of graphite varies from 8.74% to 11.79%.

Semi-precious Stone:

Semi-precious stones like garnet (almandine, rhodolite, hessonite) moon stone and beryl are reported from Gotarei, Ghagarmunda, Katumunda, Asanabahal, Tiperijharan and Nakanaki area of Kamakhyanagar sub-division.

Other than the above mentioned minerals, minor minerals such as river sand, laterite slabs, building stone/black stone/road metals, morrum, brick earth etc. are also available in the district.

Status of Mining:

There are four numbers of Mining Leases for Chromite granted in favour of Private and PSU in Kamakshyanagar Sub Division (one lease held by M/s FACOR Ltd. another belongs to M/s Real India Consultancy Ltd. & the other two are held by M/s O.M.C.Ltd). Other than these chrome zone area some sporadic patches of

Quartz, Fireclay and Graphite deposits have also been located in the Hindol and Kamakshyanagar Sub- Division.

One Mining Lease for Quartz & Quartzite in village Chandpur has been granted in favour of A.C.Rout, subsequently the mining lease has been transferred in the name of Smt. Sumitra Rout, W/o ex-lessee A.C.Rout, after his death and presently is in operation.

Sl. No.	Name of the Mines	Name of Lessee.	Area in hects.	Mineral	Period of Lease		Type of mines	Status of lease.
1.	Kathpal Chromite Mines	M/s FACOR Ltd.	113.312	Chromite	07.10.1992	06.10.2012	Under ground	Non working.
2.	Kathpal Chromite Mines	M/s OMC Ltd	386.879	Chromite	10.02.1969	09.02.2039 (Not executed)	Opencast	Non working.
3.	Birasal Chromite Mines.	M/s OMC Ltd	583.021	Chromite	04.11.1976	03.11.2026 (Not executed)	Opencast	Non working.
4.	Asurabandha Chromite Mines	M/s. Real India Consultancy Ltd.	91.827	Chromite	25.05.2015	24.05.2035	Opencast	Working.
5.	Chandpur Quartz & Quartzite Mines	Smt. Sumitra Rout	4.653	Quartz & Quartzite	08.04.2007	07.04.2027	Opencast	Working.

Also, there are running quarries for production of road metal, sand, laterite slab and moorrum.

Collection of Mining Revenue in respect of Dhenkanal District.

Year	Collection of Mining Revenue from Dhenkanal District (In Rs.)
2014-15	Rs.6,01,60,864/-
2015-16	Rs.10,26,76,212/-
2016-17	Rs.6,77,49,348/-
2017-18	Rs.5,48,83,181/-
2018-19	Rs.8,57,53,030/-

3. GENERAL PROFILE

a. Administrative set up:

Sl No	Item	Unit	Magnitude
1	Location		
	Longitude	Degree	85^{0}58' to 86^{0}02'East
	Latitude	Degree	20^0 29' to 21^{0}11' North
2	Geographical area	Sq.Km.	4452
3	Sub-division	Numbers	3

4	Tahasils	Numbers	8
5	C D Blocks	Numbers	8
6	Municipalities	Numbers	1
7	NACs	Numbers	3
8	Police Stations	Numbers	15
9	Gram Panchayats	Numbers	212
10	Villages	Numbers	1208
	Inhabited	Numbers	1081
	Uninhabited	Numbers	127
11	Assembly constituencies	Numbers	4

b. Area and Population:

The district has an area of 4452 sq.kms and 11.93 lakhs of population as per 2011 census. The district accounts for 2.86 percent of the states territory and shares 2.84 percent of the state's population. The density of population of the district is 268 per sq. km as against 270 person per sq.km of the state. It has 1208 villages (including 127 un-inhabited villages) covering 8 blocks, 8 Tahasils and 3 Subdivisions. As per 2011 census the schedule caste population is 2.34 lakhs (19.6%) and schedule tribe population 1.62 lakhs (13.6%). The literacy percentage of the district covers 78.8 against 72.9 of the state.

c. Climate :

The climate condition of the district is generally hot with high humidity during April to May and cold during December to January. The monsoon generally breaks during the month of June. Annual rainfall of the district was 1109.68 mm in 2018-19 which is less than the normal rainfall (1421.1 mm).

d. Economy:

Agriculture occupies a vital place in the economy of the district, as it provides direct and indirect employment to around 70 % of its total work force, as per the 2001 census. The total cultivable area of this District is 115000 hectares, covering 30.0 % of its total geographical area. The major crops of the Kharif season are paddy, maize, ragi, oilseeds, pulses, small millets and vegetables

etc. Paddy, wheat, maize, field pea, sunflower, garlic, ginger, potato, onion, tobacco, sugarcane and coriander etc are the major Rabi crops.

The last decade has witnessed a tremendous improvement in the industrial scenario of the District. Besides various kinds of handicraft works like Dhokra, Brass and bell metal, horn works, straw works and wood carving have been developed by the skilled workers and artisans of the district.

e. Industry:

M/s Scaw Industries (P) Ltd., M/s Tata Bhusan Steel & Strips,, M/s Rana Sponge Ltd. & BRG iron & Steel Ltd. Are some of the major plants within Dhenkanal district established during 2006-07.

Till 2005-06, seven chrome ore beneficiation plants (COBP) are operating within Dhenkanal. The quantity of low grade chrome ore utilized by these plants during 2005-06 varied between 96 MT to 532 MT.

No. of MSME units set up	Investment (In Rs. crores)	Employment Generated				Employment of women
		SC	ST	General	Total	
1482	9486.22	52	12	1636	1700	20

f. Agriculture:

During the year 2017-18 the net area sown was 111 thousand hectares against 5356 thousand hectares of the state. The production of was as below:

Name	Paddy	Wheat	Maize	Mung	Biri	Kulthi	Till	Groundnut	Mustard	Potatoes	Jute	Sugar cane
Production in 000 MT	131.53	0.00	5.33	14.99	12.57	3.40	7.28	21.8	1.28	0.00	11.91	50.98

During 2017-18, the total fertilizers used in the district was about

Type of fertiliser	Nitrogenous	Phosphatic	Pottasic	Total	Consumption per Ha
Quantity in MT	3421	1537	799	5757	28.16

g. Power:

Consumption of electricity in Dhenkanal district during the year 2011 covers 266.250 million units and villages so far electrified as on February, 2011 is 1053 which constitutes 97.4 % to the total inhabited villages of the district.

h. Transport & Communication:

Railway route length (14-15) km	50.60
No of Rly stations and PH(14-15)	8
Forest road (17-18) km	272.28
National Highway (16-17) km	159.11
State Highway (17-18) km	2.04
Major district road (17-18) km	101.55
Other dist road (17-18) km	489.28
Rural road(17-18) km	1225.71
Inter village road (16-17) km	1888.60
Intra village road (16-17) km	2016.32

i. Health:

The medical facilities are provided by different agencies like Govt., Private individuals and voluntary organizations in the district.

Sub divisional hospitals including mobile	11 No
Beds facilities	487 No
Homoeopathic dispensaries	22 No
Ayurvedic dispensaries	19 No

j. Tourist places:

There are 9 nos. of tourist center such as Kapilas, Joranda, Jibankhol, saptasaiya, Saranga, Kualo, Ladagarh, Dandadhar and Tentuliapada identified by department of Tourism and Culture, Odisha. During 2011, the numbers of Domestic tourists were 1046050 and foreign tourists were 79 who visited the tourists spots of the district.

k. Forest areas:

Category of forest	Area in sq km
Reserve Forest	1141.02
Unclassified Forest	0.04
Demarcated Protected Forest (DRF)	13.78
Undemarcated Protected Forest	0
Other forest under Revenue Dept	582.78
Total	1737.6

l. Education:

Primary School (2017-18)	No. of Schools	887
	Enrolment (No)	97099
	Pupil Teacher Ratio	17.43
Upper Primary School 2017-18	No. of Schools	709
	Enrolment (No)	57358
	Pupil Teacher Ratio	18.46
Gerneral College 2017-18	Junior	51
	Degree	31
Secondary School	No. of Schools	279
	Enrolment (No)	36090
	Pupil Teacher Ratio	22.84
Literacy Rate, 2011	Male	86.2
	Female	71.0
	Total	78.8

m. Culture & Heritage:

Dhenkanal is very rich in case of eminent personalities. Baji Rout (freedom fighter), Bira Baishnaba Pattanaik (Freedom Fighter), Brajanath Badajena (Eminent Poet), Sarangadhar Dash, Nandini Satpathy (First and only woman Chief Minister of Odisha), Kalpana Das (First woman from Odisha to scale Mt Everest) are some of the prominent personalities born in this district.

Dhenkanal district is very much famous for its fairs and festivals. Gajalaxmi Puja is very much popularly known festival to be celebrated in the District. Every year this festival begins from Kumar Purnima and continues for eleven days. Kapilash is the abode of Lord Chandra Sekhar which is one

of the famous tourist spot of Odisha. Every year during Mahashiv Ratri "Jagar Yatra" is being observed. Dussehera festival of Kamakhyanagar bears a special significance in the culture of Dhenkanal District. Maghamela at Joronda is yet another most famous festival of 'Mahima Dharma'. Every year it begins on 'Magha Purnima' and continues for four days at Jorondo. Bullock festival of Bhuban has a special identity. Racing competition is held among the bullocks and prizes are awarded to the owners.

4. GEOLOGY

Geologically the district exposes various lithostratigraphic units having varied litho assemblages. The oldest units are Singbhum Granite and Gorumahishani Group of Archaean age, followed by rocks of Easternghat Super Group, Bonai Granite Complex and ultramafics of Sukhinda/Baula Nuashi of Archaean to Proterozoic age, intrusives of Proterozoic age, Gondwana Super Group of Upper Carboniferous to Permian, laterite of Cainozoic and Quarternary of Pleistocene to Recent age. Singbhum granite is the oldest rock of the area. A small patch of this rock is found northern part of the area. Gorumahishani Group of rocks is exposed in the northern part of the district especially to the north of Bramhani river. The Group comprises hornblende schist, quartzite, quartz sericite schist, grit and conglomerate. They are marked by the development of quartzite horizon and associated with metabasic rocks. The field relationship between these rocks and the charnockite is obscured by the extensive development of laterite. Rocks of Easternghat Super Group mainly fall within three distinctive groups, viz; Khondalite Charnockite and Migmatite. Charnockite is associated with Khondalite and ranges from acid charnockite to basic charnockite Khondalite Group comprises quartz-garnet-sillimanite schist and Migmatite group includes augen gneiss, garnetiferous gneiss and garnetiferous leucogranite Overlying the Easternghat Suprgroup exists granite of Bonai Granite Complex. This rock association mainly consists of granite, biotite gneiss, biotite-hornblende granite gneiss and granodiorite with polycyclic remobilization. Small rafts of chromite bearing ultramafics are noted in the granite gneiss of Migmatite Group and Gorumahishani Group near Moulabonja Parbat in the north and around Kandhara area. The intrusives include dolerite dykes and granophyre. Dolerite cut across the granite and ultramafic enclaves. The granite and gneiss are also intruded

by granophyre at places. The western part of the area is occupied by Gondwana Group of rocks. The lower Gondwana Rocks i.e. Talchir Formation comprises boulder bed, tillite, sandstone and shale. In association to this formation, white to reddish sandstone with purple shale, carbonaceous shale and coal occur which is designated as Barakar Formation. Patches of laterite occur mainly at the top of the hills that is made up of khondalite and ultramafics. Laterisation is very common in the north where it is mostly thick and ferrugeneous. Residual soil and alluvium with or without impersistent laterite cover banks of Bramhani river and the river basin. The age of the quaternary deposits varies from Pleistocene to recent.

Both primary and secondary structures are exposed in the area. Bedding is common in the Gondwana rocks. The strike of the bedding plane varies from N20°W to S20°E to N40°E to S 40°W with gentle east-notheasterly dip. The Gondwana formations are flanked towards north by granite with enclaves of quartzite trending NW-SE with dip varying from 30° to 70° towards northeast. Foliation is common secondary structure in Gorumahishani and Easternghat Group of rocks. Dip of the foliation varies from very low 5° to almost vertical. Faults and lineaments are common in the area. Most of the faults are of Proterozoic age whereas faults found at the boundary of Gondwana rocks are much younger.

The geological succession in the district is as follows:

STRATIGRAPHY:

Age	Geological Unit		Lithology
Pleistocene to Recent	Quaternary (undifferentiated) sediments		Residual soil and alluvium Alluvium with impersistent laterite
Cainozoic			Laterite
Permian	Gondwana Supergroup	Barakar Formation	Sandstone, shale, coal
Upper Carboniferous to Permian		Talchir Formation	Boulder bed, tillite, sandstone and shale
Proterozoic		Intrusives	Granophyre Dolerite
			Ultramafics of Sukinda/Baula Naushi
		Bonai Granite	Granite

		Complex	
Archaean to Proterozoic		Migmatite Group	Augen gneiss, garnetiferous gneiss, garnetiferous leucogranite
	Easternghat Supergroup	Charnockite Group	Acid Charnockite Basic Charnockite
		Khondalite Group	Quartz-garnet-silimanite-graphite schist/gneiss Quatzite
Archaean		Gorumahishani Group	Hornblende schist Quartzite/quartz-sericite schist Grit, conglomerate and quartzite/sandstone
		Singbhum Granite complex	Granite

5. DRAINAGE AND IRRIGATION PATTERN.

The river Brahmani and it's tributaries control the drainage of the district. Brahmani is the second longest river in Odisha and flows through the district in a general east-west direction. It divides the district into two halves. Initially, the river flows in a north-south direction, then follows a northwest-southeast course and subsequently changes to northeast-southwest direction. Finally, it changes to a northwest-southeast course near the eastern border of the district. Most part of the district falls within it's basin. The Brahmani is perennial in nature with a nominal flow during the summer season. It's important tributaries are Ramiala Nadi, Nigre Nadi, Purajhor Nadi etc. The smaller streams show dendritic pattern while the major river and it's tributaries show sub-parallel drainage, indicating structural control.

Major part of the district is irrigated through canal irrigation from the dam at Rengali.

6. LANDUSE PATTERN

Sl No	Landuse	Area in '000Ha
1	Forest Area	174
2	Misc. trees & Grooves	6
3	Permanent Pasture	8
4	Culturable Waste	4
5	Land put to Non Agril Use	40

6	Barren & Unculturable Land	5
7	Current Fallow	75
8	Other Fallow	20
9	Net Area Sown	111
10	Mining	2
	Geographical Area	445

7. SURFACE WATER & GROUND WATER SCENARIO

The drainage systems i.e. rivers of the district gets filled with water during the monsoon and the gradually it decreases from the month of January to June of each year. In the summer season all rivers become almost dry excepting narrow flow of water within the basin.

The variation of ground water table in the district is as follows:

Depth of water level (mbgl)/ Period	**April**	**August**	**November**	**January**
Minimum	2.5	0.15	1.25	1.80
Maximum	12.5	5.80	7.69	9.0

8. RAINFALL & CLIMATIC CONDITION

The district is generally hot with high humidity during April and May and cold during December and January. The monsoon generally breaks during the month of July and continues till end of October. The temperature goes as high as up to 45^0C in the summer and up to 7^0-8^0 C during peak winter.

The rainfall statistics of the district for last four years is given below:

Year/ Month	APRIL	MAY	JUNE	JULY	AUGUST	SEPT.	OCT	NOV	DEC	JAN	FEB	MARCH	TOTAL	AVG
2015-16	592.2	372.6	1259.1	2615.7	1674	998.4	257.4	0	185	13	257	256.2	8480.6	706.72
2016-17	17.3	778.2	950.2	2959.8	2754.4	964.2	542.2	168.8	0	0	0	304.2	9439.3	786.61

2017-18	47.1	594	1010.8	1575.8	1935	1792.6	1342.5	450.6	15.1	0	0	3.9	8767.4	730.62
2018-19	774.7	927.5	1369.3	3379.1	2122.6	2871.9	1237.1	0	274.5	0	185	175	13316	1109.68

9. DETAILS OF MINING LEASES

Sl. No.	Name of the Concession	Type of concession (PL/ML/Composite)	Status (Running/Temp Closed)	Name of Concession Holder	Village	Tahasil	Co-ordinates of all Boundary points						Area (Ha)	Validity of Concession	
							Latitude			Longitude					
							Deg	Min	Sec	Deg	Min	Sec		From	To
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Chandpur Quartz & Quartzite Mines	ML	Running	Sumitra Rout	Chandpur	Parjang	21	5	27.39	85	19	14.390	4.653	08.04.2007	07.04.2027
							21	5	23.13	85	19	13.509			
							21	5	17.35	85	19	13.548			
							21	5	17.07	85	19	16.947			
							21	5	20.9	85	19	17.657			
							21	5	21.19	85	19	19.263			
							21	5	22.39	85	19	19.801			
							21	5	23.89	85	19	17.699			
							21	5	25.22	85	19	18.848			
							21	5	25.79	85	19	21.690			
							21	5	27.13	85	19	21.767			

10. DETAILS OF ROYALTY COLLECTED

Name of the Concession	FY	Collection of Royalty (Rs)	Collection of Other Revenue (Rs)	Production (Ton)
Chandpur Quartz & Quartzite Mines	15-16	-	13960	-
	16-17	-	13960	-
	17-18	225000	13960	2085.000
	18-19	240000	13960	3494.010

11. DETAILS OF PRODUCTION OF MINOR MINERAL

Please refer the above table.

12. MINERAL MAP OF THE DISTRICT

Attached as Plate No 4.

13. LIST OF LOI HOLDERS ALONG WITH VALIDITY

Not applicable

14. TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT

Total mineral resource of quartzite of the existing mine is 8,28,397 cum which may increase after detail investigation of other parts of the district.

15. QUALITY/GRADE OF MINERAL

The cut-off grade for refractory grade quartzite in general can be taken as +98% SiO_2. This quartzite is used by the lessees in their Refractory plants for making of refractory bricks.

Similarly, quartzite having 97 % to 98% SiO_2 can be categorized as steel grade quartzite used in steel plants as flux.

Quartzite having <97% SiO_2 has no metallurgical use at present and can be used as road metal.

16. USE OF MINERAL

Quartzite having +98% SiO_2 is used in Refractory plants for making of refractory bricks.

Quartzite having 97 % to 98% SiO_2 is used in steel plants as flux.

Quartzite having <97% SiO_2 has no metallurgical use at present and can be used as road metal.

17. DEMAND & SUPPLY OF THE MINERAL

The tentative annual demand of quartzite for steel grade is to the tune of 1.5 lakh cum and is mainly supplied from the existing mining lease of the district and from Mayurbhanj and Keonjhar districts.

18. MINING LEASES MARKED ON THE MAP OF THE DISTRICT.

Attached as Plate No 5.

19. DETAILS OF AREAS WHERE THERE IS A CLUSTER OF MINING LEASES

Not applicable.

20. DETAILS OF ECO-SENSITIVE AREA

Kapilash Sanctuary and its eco-sensitive zone are located within the district.

21.IMPACT ON THE ENVIRONMENT (AIR, WATER, NOISE, SOIL FLORA & FAUNAL , LAND USE , AGRICULTURE, FOREST ETC.) DUE TO MINING

Activities attributed to Mining:-

Generally, the environment impact can be categorized as either primary or secondary. Primary Impacts are those, which are attributed directly by the project. Secondary impacts are those which are indirectly induced and typically include the associated investment and changed pattern of social and economic activities by the proposed action.

The impact has been ascertained for the project assuming that the pollution due to mining activity has been completely spelled out under the base line environmental status for the entire ROM which is proposed to be exploited from the mines.

Impact on Ambient Air

Mining operation are carried out by opencast manual, semi mechanized/ mechanized methods generating dust particles due to various activities likes, excavation, loading, handling of mineral and transportation. The air quality in the mining areas depends upon the nature and concentration of emissions and meteorological conditions.

The major air pollutants due to mining activities include:-

- Particulate matter (dust) of various sizes.
- Gases, such as sulphur dioxide, oxides of nitrogen, carbon monoxide etc from machine & vehicular exhaust.

Dust is the single air pollutant observed in the open cast mines. Diesel operating drilling machines, blasting and movement of machineries/ vehicles produce NOx , SO2 and CO emissions, usually at low levels. Dust can be of significant nuance surrounding land user and potential health risk in some circumstances.

Water Impact

Sometimes the mining operation leads to intersect the water table causing ground water depletion. Due to the interference with surface water sources like river, nallah etc drainage pattern of the area is altered.

Noise Impact

Noise pollution mainly due to operation of machineries and occasional plying of machineries. These actives will create noise pollution in the surrounding area.

Impact on Land environment

The topography of the area will change certain changes due to mining activity which may cause some alteration to the entire eco system.

Impact on Flora & Fauna

The impact on biodiversity is difficult to quantify because of it's diverse and dynamic characteristics.

Mining activities generally result in the deforestation, land degradation, water, air and noise pollution which directly or indirectly affect the faunal and flora status of the project area.

However, occurrence and magnitude of these impacts are entirely dependent upon the project location, mode of operation and technology involved.

22. REMEDIAL MEASURES TO MITIGATE THE IMPACT OF MINING ON THE ENVIRONMENT:-

Air

Mitigation measures suggested for air pollution controls are to be based on the baseline ambient air quality of the project/cluster area and would include measures such as:

- Dust generation shall be reduced by using sharp teeth of shovels.
- Wet drilling shall be carried out to contain the dust particles.
- Controlled blasting techniques shall be adopted.
- Water spraying on haul roads, service roads and overburden dumps will help in reducing considerable dust pollution.
- Proper and regular maintenance of mining equipment's have to be undertaken.
- Transport of materials in trucks are to be covered with tarpaulin.
- The mine pit water can be utilized for dust suppression in and around mine area.
- Information on wind diction and meteorology are to be considered during planning, so that pollutants, which cannot be fully suppressed by engineering techniques, will be prevented from reaching the nearby agricultural land, if any.
- Comprehensive greenbelt around overburden dumps and periphery of the mining projects/clusters has to be carried out to reduce to fugitive dust transmission from the project area in order to create clean & healthy environment.

Water

- Construction of garland drains and settling tanks to divert surface run –off of the mining area to the natural drainage.
- Construction of checks dams/ gully plugs at strategic places to arrest silt wash off from broken up area.
- Retaining walls with weep hole are to be constructed around the mine boundaries to arrest silt wash off.

- The mined out pits shall be converted in to the water reservoir at the end of mine life. This will help in recharging ground water table by acting as a water harvesting structure.
- Periodic analysis of mine pit water and ground water quality in nearby villages are to be undertaken.
- Domestic sewage from site office & urinals/latrines provided within ML/QL areas is to be discharged in septic tank followed by soak pits.

NOISE

- Periodic maintenance of machineries, equipments shall be ensured to keep the noise generated within acceptable limit.
- Development of thick green belt around mining/cluster area, haul roads to reduce the noise.
- Provision of earplugs to workers exposed to high noise generating activities like blasting, excavtion site etc. Worker and operators at work sites will be provided with earmuffs.
- Conducting periodical medical checkup of all workers for any noise related health problems.
- Proper training to personnel to create awareness about adverse noise related effects.
- Periodic noise monitoring at locations within the mining area and nearby habitations to assess efficacy of adopted control measures.
- During blasting optimum spacing, burden and charging of holes will be made under the supervision of competent qualified mines foreman, mate etc.

Biological Environment

- Development of green belt/gap filling saplings in the safety barrier left around the quarry area/ cluster area.
- Carrying out thick greenbelt with local flora species predominantly with long canopy laves on the inactive mined out upper benches.
- Development of dense poly culture plantation using local floral species in the mining areas at conceptual stage if the mine is not continued much below the general ground level.
- Adoption of suitable air pollution control measures as suggested above.
- Transport of materials in trucks covered with tarpaulin.

23. RECLAMATION OF MINED OUT AREA (BEST PRACTICE ALREADY IMPLEMENTED IN THE DISTRICT, REQUIREMENT AS PER RULES AND REGULATION, PROPOSED RECLAMATION PLAN) :-

As per statute all mines/quarries are to be properly reclaimed before final closure of the mine. Reclamation of exhausted mines are planned to be undertaken in below three possible means:

1. If, substantial amount of waste is there, the exhausted quarry can be fully or partly backfilled using the stored waste. The backfilled areas are to be brought under plantation of local species.
2. If the generation of waste is much less as in the case of minor mineral mining, the exhausted quarries can be reclaimed by
   a. Plantation on the broken up surface if the depth of quarry is not much below the surrounding surface level.
   b. Converted to water reservoir after stabilization of the slopes if the exhausted quarry continues much below the surrounding surface level. It is preferred to cordon the water reservoir either through wire fencing or retaning wall with plantation from the safety point of view.

Most of the quarry/mining lease areas are yet to be exhausted from ore point of view. Hence, reclamation would be taken up only after exhaustion of the ore/mineral content from these areas. The exhausted minor mineral quarries of the district have been converted to water reservoirs.

24. RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

The only risk involved related to mining of minor mineral excepting natural calamities is slope failure and probable accidents due to high and ill maintained bench walls. This can only be addressed through making of regular benches and undertaking mining in benching pattern.

The disaster management plan (DMP) is supposed be a dynamic, changing, document focusing on continual improvement of emergency response planning and arrangements.

The disaster management plan is to be aimed to ensure safety of life, protection of environment, protection of installation, restoration of production

and savage operations in this same order of priorities. For effective implementation of the disaster management plan, it should be widely circulated through rehearsal/induction conducted by the respective department from time to time .

General responsibilities of employees' during an emergency:

During an emergency, it becomes more enhanced and pronounced when an emergency warning is raised, the worker in charge, should adopt safe and emergency shut down and attend to any prescribed duty. If no such responsibility is assigned, the workers should adopt a safe course to assembly point and wait instructions. He should not resort to spread panic. On the other hand, he must assist emergency personnel towards objectives of DMP.

Co-ordination with local authorities:

The Mine Manger who is responsible for emergency will always keep a jeep ready at site. In case of any eventuality, the victim will be taken to the nearby hospitals after carrying out the first aid at the site. The Manger should collect and have adequate information of the nearby hospitals, fire station, police station, village panchayat heads, taxi stands, medical shops, district revenue authorities etc. and use them efficiently during the case of emergency.

25. DETAILS OF THE OCCUPATION HEALTH ISSUES IN THE DISTRICT. (LAST FIVE- YEAR DATA OF NUMBER OF PATIENTS OF SILICOSIS & TUBERCULOSIS IS ALSO NEEDS TO BE SUBMITTED):-

As per the guidelines of the Mine Rules 1995, occupational health safety has been stipulated by the ILO/WHO. The proponent's will take necessary precautions to fulfil the stipulations. Normal sanitary facilities have to be provided within the lease area. The management will carry out periodic health checkup of workers.

Occupational hazards involved in mines are related to dust pollution, noise pollution, blasting and injuries from moving machineries & equipment and fall from high places. DGMS has given necessary guidelines for safety against these occupational hazards. The management has to strictly follow these guidelines.

All necessary first aid and medical facilities are to be provided to the workers. The mine shall be well equipped with personal protective equipment (PPE). Further, all the necessary ported equipments such as helmet, safety goggles, earplugs, earmuffs etc are to be provided to mine workers as per Mines Rules. All operators and mechanics are to be trained to handle fire fighting equipments.

TUBERCULOSIS DATA

YEAR	TOTAL
15-16	
16-17	
17-18	
18-19	

There is no case of Silicosis found in the district within the time frame mentioned above.

26. PLANTATION OF GREEN BELT DEVELOPMENT IN RESPECT OF LEASES ALREADY GRANTED IN THE DISTRICT

As most of the minor mineral mines/quarries of the district are yet to be exhausted of their mineral content no sort of reclamation measures including plantation has been undertaken excluding gap plantation of local species in the peripheral safety zones of the quarries/ clusters and in some of the haul roads.

27. ANY OTHER INFORMATION

PLATE NO- 1

INDEX MAP

ODISHA

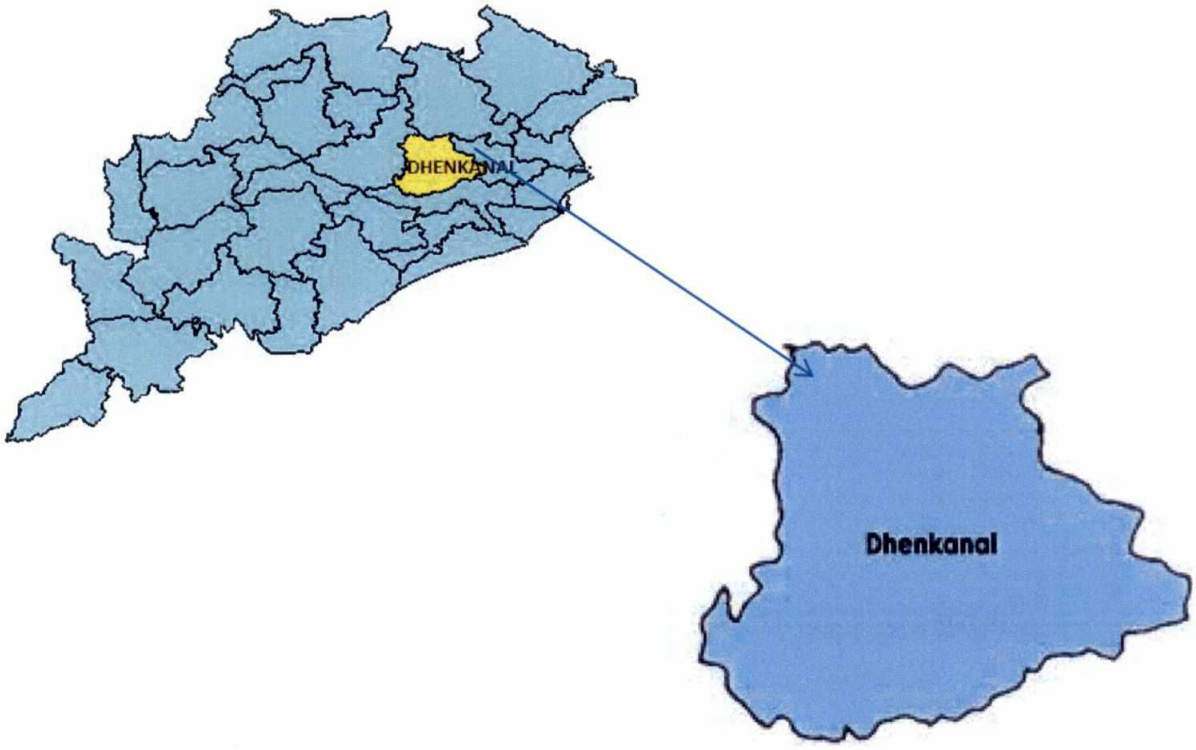


PLATE NO- 2

MAP SHOWING THE TAHASILS OF DHENKANAL DISTRICT

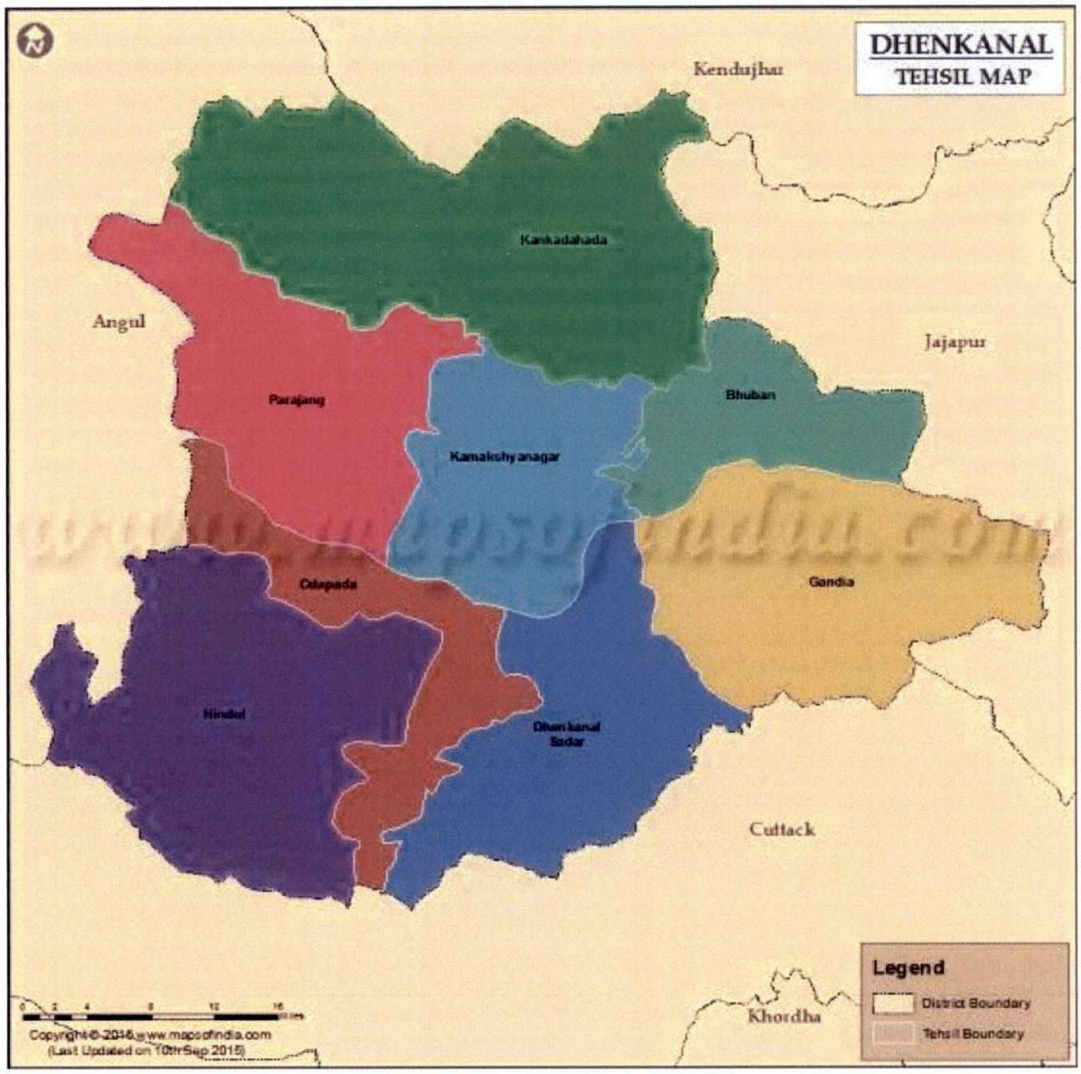
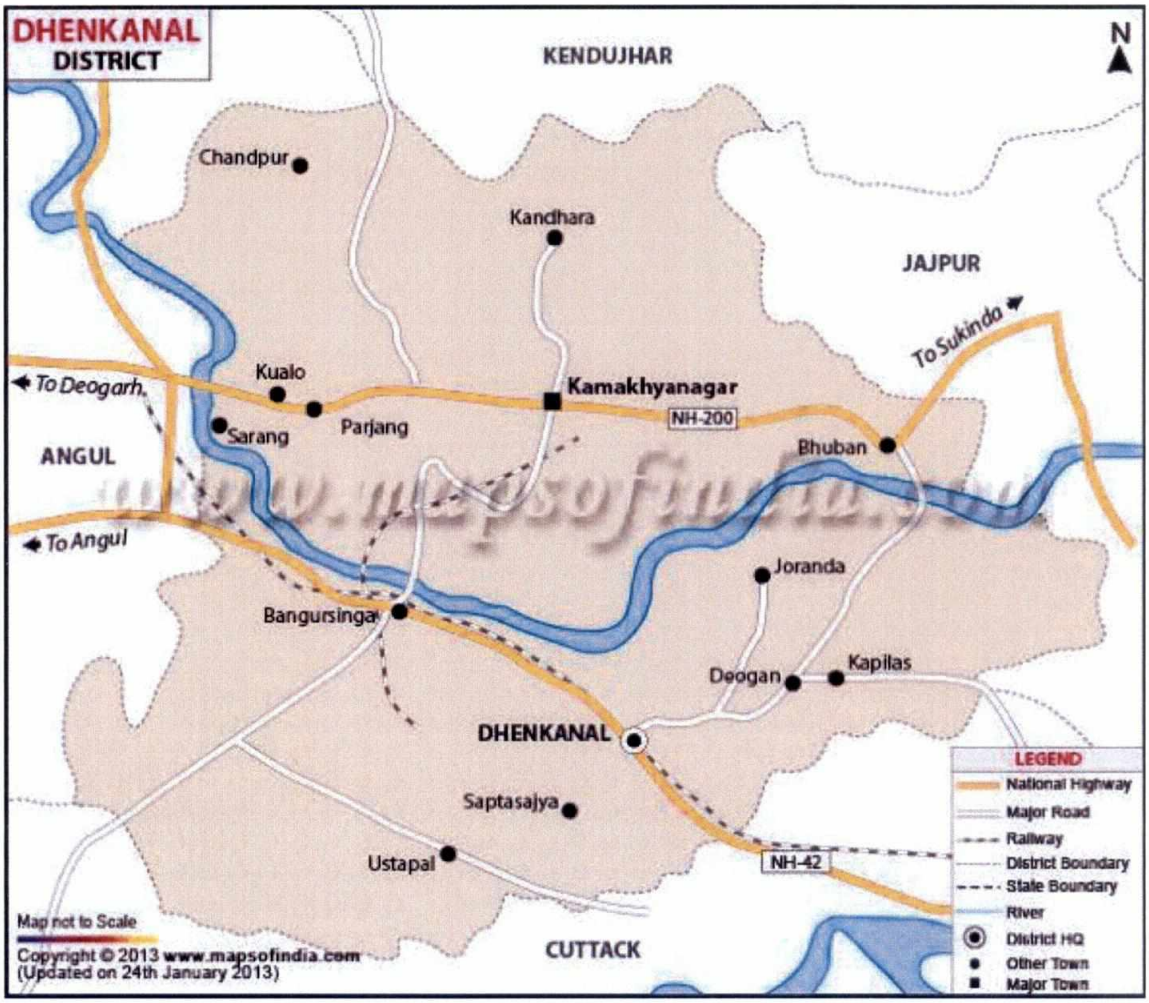


PLATE NO- 3

MAP SHOWING THE MAJOR ROADS OF DHENKANAL DISTRICT



MINERAL MAP OF DHENKANAL DISTRICT

SCALE :- 1:110,000

Kilometers

PLATE NO-4

KENDUJHAR DISTRICT

ANGUL DISTRICT

JAJPUR DISTRICT

CUTTACK DISTRICT

Toradaali

Dolia

Jhili

Gotadedia

Kandhara

Kamakhyanagar

Moulabhanja

Akulakondi

Brahmani River

NH-42

N.E. RAILWAY

DHENKANAL

Hendol

Legend

- Block Headquarter
- District Boundary
- NH Road / SH Road/Major District Road
- Railway Line
- River/Lake/Waterbody
- Acid Charnockite (Cha)
- Alluvium with impersistant laterite (Ql)
- Augen gneiss,garnetiferous gneiss, garnetiferous leucogranite
- Basic Charnockite (Chb)
- Boulder bed,tillite,sandstone and shale
- Dolerite
- Granite
- Granophyre
- Laterite
- Quartz-garnet-sllimanite-graphite schist/gness(Ks) Quatzite(Kq)
- Residual soil and alluvium(Qs)
- Sandstone,shale,coal
- Ultramafics of Sukinda/Baula Naushi
- Hornblende schist (Gh) Quartzite/quartz-sercite schist (Gq) Grit,conglomerate and quartzite/sandstone(Gc)

LEASE/POTENTIAL MAP OF QUARTZITE IN DHENKANAL DISTRICT

SCALE :- 1:110,000

PLATE NO-5