

**INDIAN BUREAU OF MINES
MINERALS DEVELOPEMMENT AND REGULATION DIVISION**

MCDR INSPECTION REPORT

Nagpur regional office

Mine file No : MAH/CND/LST-20/NGP

Mine code : 38MSH08022

- (i) Name of the Inspecting : M017) ASHISH MISHRA
Officer and ID No.
- (ii) Designation : Assistant Controller Mine
- (iii) Accompanying mine : Shri R.R.PRASAD, GM Mines
Official with
Designation
- (iv) Date of Inspection : 07/10/2017
- (v) Prev.inspection date : 28/09/2016

PART-I : GENERAL INFORMATION

1. (a) **Mine Name** : **MARATHA (579.90 HA)**
- (b) **Registration NO.** :
- (c) **Category** : A Fully Mechanised
- (d) **Type of Working** :
- (e) **Postal address**
- State : MAHARASHTRA
- District : CHANDRAPUR
- Village : SONAPUR
- Taluka : RAJURA
- Post office : UPPARWAHI
- Pin Code : 442908
- FAX No. :
- E-mail :
- Phone :
- (f) **Police Station** :
- (g) **First opening date** :
- (h) **Weekly day of rest** :
2. **Address for** :
- correspondance**
3. (a) **Lease Number** : MSH0012
- (b) **Lease area** : 579.9
- (c) **Period of lease** : 50
- (d) **Date of Expiry** : 30/12/2034
4. **Mineral worked** : LIMESTONE Main

5. Name and Address of the

Lessee : M/S AMBUJA CEMENTS LTD.
ELEGANT BUSINESS PARK
GREATER BOMBAY MAHARASHTRA
Phone:
FAX :

6. Date of approval of Mining	:	Mining Scheme rule 12 MCDR1988	11/06/2009
Plan/Scheme of Mining	:	Mining Scheme rule 12 MCDR1988	20/02/2015

PART - II : OBSERVATION/COMMENTS OF INSPECTING OFFICERS

Exploration :

Sl.No.	Item	Proposals	Actual work	Remarks
1a	Backlog of previous year	For the SOM for period 2014-15 to 2018-19, exploration through 89 boreholes with meterage of 3940m was proposed at a grid interval 100m X 100m or closer to understand the geology of the intricate deposit and behavior of floor of limestone.	The proposed exploration was completed in the year 2014-15 itself. Total 86 boreholes with a meterage of 4456 m were drilled in that year at 100m X 100m grid interval.	Hence no backlog is pending for exploration.
1b	Exploration over lease area for geological axis 1 or 2	G1 level detailed exploration over entire potentially mineralized area has been completed.	G1 level exploration.	
1c	Exploration Agencies and Expenditure in lakh rupees during the year	Exploration was carried out by the lessee himself in the year 2014-15. For 2016-17, no exploration was done, hence expenditure on exploration for 2016-17 is Nil.	Nil for the year 2016-17.	For 2014-15, as per the Annual Returns, cost of exploration is Rs 3.07 per T. This derives to expenditure on exploration activities to about Rs 40 Lakhs.

1d	Balance area to be explored to bring Geological axis in 1 or 2	Nil	Nil	Detailed exploration over the potentially mineralized area has been completed. Exploration for depth persistency beyond the explored depth, if required, shall be done in future.
1e	Balance reserve as on 01/04/20	Balance Reserves as on 01/04/2017:	111: 36 MT 121: 11 MT 211: 28 MT 221: 25 MT 332: 6 MT	
1f	General remarks of inspecting officers on geology, exploration etc			Limestone occurring in the lease area is of good quality (Avg CaO 45% and above). There are shale partings and clay bands but overall grade is good and as per the reported reserves, Grade is 'Lumpy Medium Grade' (Cement Grade). Exploration done is upto the mark and the area has been proved upto 210 mRL (clearance limit). Further, previously, one state highway was passing nearby the area due to which resources were blocked, but presently, the highway has been shifted.

Development :

Sl.No.	Item	Propasals	Actual work	Remarks
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2a	Location of development w.r.t.lease area	As per the proposals, locations of development are as follows:- 1. N2179100 to N2179800, E311600 to E312500 2. N2179000 to N2179200, E311200 to E311400 3. N2179700 to N2180000, E311500 to E311800 4. N2180500 to N2180900, E310500 to E310700	Location for the development are as per the proposals.
2b	Separate benches in topsoil, overburden and minerals (Rule 15)	Yes	There are separate benches in top soil, overburden/waste and minerals.
2c	Stripping ratio or ore to OB ratio	0.17 (Ore= 1.50 MT, Waste/OB=0.252 MT)	0.37 (Ore= 1231200T, Waste/OB= 455987T)
2d	Quantity of topsoil generation in m3	150000 cuM	132715 cuM
2e	Quantity of overburden generation in m3	0.252 MT	0.456 MT

2f	General remarks of inspecting officers on development of pit w.r.t. type of deposit etc	The deposit of this belt falls under simple to complex category with inherent quality variation since it comprises bands of limestone, shaly limestone and shale. Therefore, development of pits have been planned accordingly to meet quality and quantity requirements. As the Cement Plant has 3 captive leases of which, other two are adjoining to this lease, development has been made considering overall feed from all the 3 leases.
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Exploitation:

Sl.No.	Item	Propasals	Actual work	Remarks
3a	Number of pit proposed for production	3 existing pits with one more pit proposed to be open in Southern part of the lease area	4 pits, as per the proposals.	
3b	Quantity of ROM mineral production proposed	1.5 MT for 2016-17	1.2312 MT	
3c	Recovery of sailable/usable mineral from ROM production	1.5 MT (100%)	1.2312 MT (100%)	ROM after crushing is being fed to kiln. There is no separation of sub-grade or mineral rejects and whatever is excavated as ROM is consumed.
3d	Quantity of mineral reject generation	Nil for the year 2016-17.	Nil	

3e	Grade of mineral rejects generation and threshold value declared.	Not Applicable	Not Applicable	Mineral having $\text{CaO} < 34\%$ i.e., threshold value declared by IBM is being dumped as waste.
3f	Quantity of sub grade mineral generation.	Nil for the year 2016-17.	Nil	
3g	Grade of sub grade mineral generation	Not Applicable	Not Applicable	Mineral having 34-40% CaO is being stacked as sub-grade mineral.
3h	Manual / Mechanised method adopted for segregating from ROM	Mechanized crushing.	Mechanized crushing.	The mechanical crushing of limestone is undertaken wherein the size of limestone is reduced to -80 mm to make it amenable for use as raw feed. A rotary impact crusher of L&T make has been installed with a rated capacity of 1200 TPH. The maximum input size of the boulder is 1 m while the output size is 70 mm.

3i	Any analysis or beneficiation study proposed and carried out for sub grade mineral and rejects.	No	No specific study was proposed but studies are underway to determine the feasibility of putting up a screening plant comprising a wobbler and screens which will help to improvise the sub grade limestone quality and to further reduce the rejects.	No R & D facilities. Though, sophisticated physical and chemical laboratories where elemental analysis, chemical analysis, microscopic analysis and particle size distribution are being carried out using x-ray florescence apparatus and aser beam apparatus and to ensure desired quality of raw mix and the cement as well, are installed/available.
3j	Provision of drilling and blasting in mineral benches	Yes. As per the present practice, down the hole drill machine of 150 mm size drill bit are deployed for drilling the blast holes. Rock breakers are also being used for breaking oversized boulders. Explosives used are Aquadyne, Energel, Kelvex-600, Kelvex-Extra (trade name).	As per the proposals.	

3k	Provision of mining machineries in mineral benches	Yes.	All the operations are through mechanical means as the mine is fully mechanized Category A mine.	The sequence of operations is dozing, drilling, blasting, loading and transportation. The equipment for the existing operating mines have been selected considering the factors like availability, utilization, scale of operation, type of material, size of deposit, topography, geological features, safety requirements, environmental considerations, capital requirements, availability of equipment and spares from indigenous sources.
3l	Whether height of benches in overburden and mineral suitable for method of mining proposed in MP/SOM	Yes.	Top soil is occurring in the lease area with average thickness of 2-3 m. This top soil is soft and being scrapped by using Dozers. After opening up the area for development and production, 8 m bench height is being maintained. Whereever required, sub-bench of 4 m height is also developed.	Based on the mechanization and geology of the deposit, bench height is suitable for the mine.

3m	Total area covered under excavation/pits	As per the approved SOM for the period 2014-15 to 2018-19, area under excavation/pits as on 01.04.2014 was 48.54 ha and additional requirement during the five year proposal period was 40.64 ha. Net area under excavation/pits as per the proposals made will be 89.18 ha on 31.03.2019	As per the Annual Return submitted for the year 2016-17, area covered under excavation/ pits is 67.29 ha.
3n	Ore to OB ratio for the pit/mine during the year.	0.17 for 2016-17	0.37 for 2016-17
3o	Total area put in use under different heads at the end of year	Details are given under actual work:	Area under: Mining: 67.29 ha Roads: 9.92 ha Infrastructure: 0.14 ha OB/ Waste Dump: 11.97 ha Top Soil Dump: 2.78 ha Plantation: 20.02 ha Total Area put to use: 112.12 ha
3p	Production of ROM mineral during the last five year period as applicable	2015-16: 1.50 MT 2014-15: 1.50 MT 2013-14: 1.50 MT 2012-13: 1.50 MT 2011-12: 1.50 MT	2015-16: 1.2115 MT 2014-15: 1.21655 MT 2013-14: 1.23 MT 2012-13: 1.40 MT 2011-12: 1.45 MT

3q	General remarks of inspecting officers on method of mining etc.	Method of mining is Category A fully mechanised which is justified in terms of capital expenditure, production requirements for feeding the Cement Plant, type of the deposit & Geology of the area.
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Solid Waste Management - Dumping:

Sl.No.	Item	Propasals	Actual work	Remarks
4a	Separate dumping of topsoil, OB and mineral rejects (Rule 32,33)	Yes.	Separate dumping for top soil, mineral rejects, sub-grade and overburden/waste is proposed and implemented. For the year 2016-17, generation of sub-grade/mineral rejects is Nil but sub-grade dumps are available for previous years' generations.	
4b	Location of topsoil, OB and mineral reject dumps	4 Top Soil Dumps, 1 Waste Dump and 1 Subgrade dump	Top Soil Dump Location: 1. E 310250 to E310500, N2179400 to N2179600, 2. E311600 to E311800, N2179800 to N2180250, 3 & 4. E311900 to E312200, N2179000 to N2179500 Waste Dup Location: E311500 to E312000, N 2178700 to N219000 Sub-grade Dump Location: E311600 to E312000, N2178900 to N2179250	Apart from stacking of top soil, it is also being utilized for plantation purpose. Locations are as per the proposals.

4c	Number of dumps within lease area and outside of lease area	All dumps within the lease area.	All dumps are within the lease area.	In the approved SOM, proposal was there to dump generated waste/OB or mineral rejects/sub-grade in the adjoining lease areas of the same lessee, but no such activities have been done and after Supreme Court order, dumping outside the lease area is strictly prohibited.
4d	Location of dumps w.r.t. ultimate pit limit (Rule 16)	All dumps are on the non-mineralized area. Few Dumps are within the ultimate pit limits.	As lease area is contiguous to other two leases held by the same lessee, UPL has been drawn combining all three leases (common boundary working). In such case, Three Top soil dumps and part of sub-grade dump is falling within the pit limits.	Sub-grade is being used for blending as and when required. Also, top soil is being used for utilization. Therefore, the dumps are active as well as depleting. Further, the lease area has limitations such as HT line, state highway etc where no mining or allied activities can be taken up. Apart from this, the lease area is divided into two blocks and waste/OB/sub-grade/top soil can't be taken out of lease area to facilitate dumping in the other block.
4e	Number of active and alive dumps.	6 Active dumps one for top soil, 2 for Mineral rejects/sub-grade and 2 for waste.	6 Active dumps are available. All dumps are having height less than 30 m (as per safety norms).	
4f	Number of dead dumps.	Nil	Nil	
4g	Number of dumps established.	Not applicable.	Not applicable.	

4h	Whether Retaining wall or garland drain all along dumps are there.	Yes.	Yes	Garland drain and retaining wall all along the dumps were found intact at the site.
4i	Length of Retaining wall or garland drain all along dumps	Yes	Around 1800 m around waste dump, 2500 m around top soil dumps and 1500 m around sub-grade dump.	
4j	Number of settling ponds	Nil	Nil	Deeper part of the pits convert into water reservoir during rainy season, apart from this, no settling pond is there within the lease area.
4k	Specific comments of inspecting officer on waste dump management			Presently, one waste dump is there in the lease area which is active with capacity of around 5 lakh cuM. It is spread over around 12 ha of area. Terraces are being developed at an interval of 10 m and presently one terrace is there. Dump is surrounded by garland drains and retaining wall as protective measure to avoid wash-off and degradation of adjacent land. This waste dump is located outside the UPL & overall waste dump management aspect is satisfactory for the lease area.

Solid Waste Management - Backfilling:

Sl.No.	Item	Propasals	Actual work	Remarks
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5a	Status of part or full extraction of mineral from mined out area before starting backfilling.	Not Applicable No backfilling is as mineral has proposed or done. not been exhausted.		At conceptual stage, no backfilling is proposed instead, the area is proposed for plantation on undisturbed land and conversion of pits into water reservoir. Also, dumps, if any, shall be stabilized through coir matting/ plantation.
5b	Area under backfilling of mined out area	Nil	Nil	
5c	Concurrent use of topsoil for restoration or rehabilitation of mineral out area (Rule 32)	Not Applicable.	Not Applicable.	Concurrent use of top soil is being done for plantation on dumps, top exploited benches & green belt building.
5d	Total area fully reclaimed and rehabilitated	Nil	Nil	
5e	General remarks of inspecting officers on backfilling and reclamation etc.			No backfilling has been proposed upto the conceptual period and pits developed are proposed to be converted into water reservoir. Further, waste dumps are proposed to be stabilized through plantation upon attaining maturity. Reclamation work is under process for non-mineralized barren land, waste lands, non-mining zone of 7.5 m or any other blocked area due to public structure through green belt development.

Progressive Mine Closure Plan:

Sl.No.	Item	Propasals	Actual work	Remarks
6a	Whether Annual report on PMCP submitted on time and correctly. Rule 23 E(2).	Yes	Yes	Compliance of Rule 26(2) of MCDR'2017
6b	Area available for rehabilitation (ha) .	Nil	Nil	
6c	afforestation done (ha).	1.0 ha of land is proposed to be converted into Green Belt.	3.0 ha land within the lease area has been converted into green belt by plantation of 5700 with tree density of 1900 saplings per ha.	Apart from plantation within lease area, 9500 saplings have been planted in nearby villages by ACF (Ambuja Cement Foundation) under CSR.
6d	No. of saplings planted during the year	No. of Saplings to be planted for 2016-17: Number of saplings not proposed, instead 1.0 ha area is proposed to be converted into Green Belt.	No. of Saplings planted for 2016-17: 15200 (5700 within lease and 9500 outside lease area)	
6e	Cumulative no .of plants	Not available.	As on 31.03.2017: Within lease area: 106737 Outside lease area: 159506	
6f	Any other method of rehabilitation	No	No	
6g	Cost incurred on watch and care during the year	Rs 70.89 Lakhs	Rs 84.46 lakh	
6h	Compliance on reclamation and rehabilitation by backfilling (i) Voids available for backfilling (L x B x D	Nil	Nil	

6i	Compliance on reclamation and rehabilitation by backfilling (ii) Voids filled by waste / tailings	Nil	Nil
6j	Compliance on reclamation and rehabilitation by backfilling (iii) Afforestation on on backfilled area	Nil	Nil
6k	Compliance on reclamation and rehabilitation by backfilling (iv) Rehabilitation by making water reservoir	Nil	Nil
6l	Compliance on reclamation and rehabilitation by backfilling (v) any other specific means.	No proposals	Nil
6m	Compliance of rehabilitation of waste land within lease (i) afforestation	Green belt development over 1.0 ha area was proposed to be done for the lease area (over 7.5 m non-mining zone).	3.0 ha of lease area covered through plantation for the year 2016-17 (within lease) and apart from within lease area, 9500 saplings have been planted for the development of greenbelt outside the lease area.
6n	Compliance of rehabilitation of waste land within lease (ii) Area rehabilitation (ha)	1.0 ha	3.0 ha
6o	Compliance of rehabilitation of waste land within lease (iii) Method of rehabilitation	No proposals	Nil

6p	Compliance of environmental monitoring (core zone and buffer zone)	Yes, environment monitoring is proposed for core zone and buffer zone.	Environment monitoring, in the core as well as buffer zone is being done as per MoEF guidelines and real time data is being sent to MoEF.	
6q	General remarks of inspecting officers on PMCP compliance and progressive closure operations etc.			Afforestation and Environment Monitoring in the core zone and buffer zone are being done regularly. Further, afforestation done is beyond the proposals within the lease area and regarding Environment monitoring, real time data is being analyzed and source of pollution is removed or cured instantly. Also, protective measures are being maintained. Therefore, PMCP compliance is being ensured and progressive closure operations are being done well above in comparison to the proposals.

Mineral Conservation:

Sl.No.	Item	Propasals	Actual work	Remarks
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7a	ROM Mineral dispatch or grade-wise sorting within lease area	ROM is not dispatched, instead, ROM after crushing and sizing and blending with sub-grade (if required) is being dispatched to cement plant. Grade dispatched is Cement Grade Limestone.	As per the proposals.
7b	Method of grade-wise mineral sorting i.e. manual or mechanical.	Mechanical.	Mechanical.
7c	Different grade of mineral sorted out at mines.	Cement grade Limestone- 43-44.50% CaO & MgO<2% Sub-grade/Mineral Rejects: 40-34% CaO, MgO <2% & High Silica (>17%)	As reported in Annual Return for the year 2016-17, Cement grade Limestone- 44.25% CaO & MgO 1.18% Sub-grade/Mineral Rejects: Nil for the year

7d	Any beneficiation process at mines .	The mechanical crushing of limestone is being undertaken wherein the size of Limestone is reduced to -80 mm to make it amenable for use as raw feed. A rotary impact crusher of L&T make has been installed with a rated capacity of 1200 TPH. The maximum input size of the boulder is 1 m while the output size is 70 mm.	As per the proposals. Other than this, Dry beneficiation techniques such as preferential crushing and screening, magnetic separation, electrostatic separation and air classification etc. were employed to reduce the SiO ₂ and SO ₃ content from the limestone samples on lab scale. It was possible to enrich the CaO content of the samples by 2-3% by simple classification beneficiation techniques. But as of now, these are not required because of R & D in plant side.	Studies are underway to determine the feasibility of putting up a screening plant comprising a wobbler and screens which will help to improvise the sub grade limestone quality and to further reduce the rejects. Apart from this, studies were also undertaken by Institute of Minerals and Materials Technology (Council of Scientific and Industrial Research), Bhubaneswar for beneficiation of low grade or high Sulphur containing Limestone few years back.
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7e	General remarks of inspecting officer on Mineral conservation and beneficiation issues	Earlier, the cement plant requirements were for CaO content >45%. At that time, some beneficiation studies were taken up on lab scale to upgrade the quality of Limestone occurring in the lease area. Now, after R & D at plant level, ROM after crushing is being fed to kiln. Some studies are still underway to upgrade the quality alongwith higher yield. At the mine level, sub-grade is being stacked separately and is being used for blending as and when required.
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Environment:

Sl.No.	Item	Propasals	Actual work	Remarks
8a	Separate removal and utilization of topsoil (Rule 32)	Yes	Yes, top soil is seprataely removed by scraping through Dozers and is being stacked at earmarked locations. As and when required, the soil is used for plantation purposes.	
8b	Concurrent use or storage of topsoil	Both.	Top soil is being stacked separately as well as being used concurrently, if needed, for the purpose of plantation.	

8c	Separate dumps for overburden, waste rock, rejects and fines (Rule 33)	Yes	Yes. There are 6 dumps, 4 for top soil, 1 each for waste and sub-grade. Below threshold value mineral ($\text{CaO} < 34\%$) is being rejected as waste and 34-40% CaO containing mineral is being stacked as sub-grade. No fines stack is available as ROM after crushing and sizing is being fed to kiln.	
8d	Use of overburden, waste rock, rejects and fines dumps for restoring the land to its original use	No such proposals.	1. There is no such area available where mineral has been completely exhausted. 2. At the conceptual stage, it is proposed to convert the pit into water reservoir and barren/waste land available into green belt. Hence, the option is not applicable.	
8e	Phased restoration, reclamation and rehabilitation of lands affected by mining operations (Pits, dumps etc)	Dumps are stabilized through terracing and plantation.	As per the proposals, terrace at 10 m interval is being made and stabilization through plantation shall be done after maturity of the dumps. As on date, all dumps are active and alive.	
8f	Baseline information on existence of plantation and additional plantation done (Rule 41)	Yes.	Yes.	
8g	Survival rate	Survival rate as proposed is 80% and above.	Survival rate for plantation done within lease area is around 81.5% and outside the lease area is 82.4%.	
8h	Water sprinkling on roads to control airborne dust	Yes, being practiced.	Yes	2 Water sprinklers of 9000 Ltr capacity are being used for the purpose.

8i	General remarks of inspecting officer on aesthetic beauty in and around mines area	Aesthetic beauty apart from normal degradation due to mining and allied activities is good due to the plantation carried out within the lease area by the lessee. Also, workplace is clean and general cleanliness is being maintained.
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Compliance of Rule 45:

Sl.No.	Item	Propasals	Actual work	Remarks
9a	Status of submission of Monthly and Annual returns		Annual Returns submitted online upto 2016-17 Monthly Returns online submitted upto December'2017 as on date.	
9b	Scrutiny of Annual return for information on Mining Engineer, Geologist and Manager	Mining Engineer in charge: Shri R R Prasad Geologist in charge: Shri J. B. Thapa Manager: Shri T. Choudhary	Correct information mentioned.	Compliance of Rule 55(1) of MCDR'2017
9c	Scrutiny of Annual return on land use pattern for area under pits, reclaimed area, dumps etc.	Covered under O/C Workings: 67.290 ha Used for waste Disposal: 14.75 ha Occupied by Infrastructure etc.: 10.06 ha Other (Plantation): 20.02 ha Total: 112.12 ha	Area under: Mining: 67.29 ha Roads: 9.92 ha Infrastructure: 0.14 ha OB/ Waste Dump: 11.97 ha Top Soil Dump: 2.78 ha Plantation: 20.02 ha Total Area put to use: 112.12 ha	As per the sub-heads available in the AR format, the information has been provided. Lessee was suggested to mention top soil & sub-grade dump area separately in others option.

9d	Scrutiny of Annual return on afforestation	Plantation: Within lease: 5700 saplings with 83% survival Outside Lease: 9500 saplings with 95% survival	Plantation done within the lease area was checked on the ground. But plantation done outside the area was seen only upon visiting some nearby villages like Kukkudsath, Manhgi etc. and overall plantation done outside the lease area was not verified on ground. Office records for the same were checked and verified (work done by Ambuja Foundation under CSR).	
9e	Scrutiny of Annual return on mineral reject generation (Grade and quantity)	Mineral Rejects for 2016-17: Nil	ROM has been fed after crushing and there was no seprate generation or stacking of mineral rejects for the year 2016-17.	For previous years' generated sub-grade, dump was verified on ground.
9f	Scrutiny of Annual return on ROM stock and/or graded ore	ROM: Opening and Closing Stocks-Nil, Production-1231200 T Graded Ore: Opening and Closing Stocks-Nil, Production-1231200 T, Dispatch-1231200 T (Cement Grade)	Correct information furnished.	
9g	Scrutiny of Annual return on sale value, Ex. Mine price and production cost	Sale Value: Nil as the mine is captive Ex. Mine Price: 222.47 Rs per T Production cost: 222.47 Rs per T	Correct information furnished.	

9h	Scrutiny of Annual return on fixed assets	Nil information furnished.	Information is furnished in the Annual Return of other lease area (880.31 ha, Minecode-38MSH08021).	As three leases of the same lessee is contiguous, capital structure/ fixed asset details have been furnished for all three leases in on lease that is Maratha Limestone Mine (880.31 ha, Minecode-38MSH08021).
9k	Scrutiny of Annual return on mining machineries	Detailed information over the machineries deployed has been furnished.	Correct information furnished.	

Details of violations observed during current inspection and compliance position of violation pointed out

Violation observed			Show cause position		
Rule NO.	Issued on	Compliance on	Rule NO.	Issued on	Compliance on

Date :
(ASHISH MISHRA)

Indian Bureau of Mines