

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

MCDR INSPECTION REPORT

Goa regional office

Mine file No : GOA/FE/146-1

Mine code : 30GOA02048

- (i) Name of the Inspecting Officer and ID No. : J003) JANGID G K
- (ii) Designation : Deputy Controller Mines
- (iii) Accompanying mine Official with Designation : Shri Vijay Mehta, Mines Manager
- (iv) Date of Inspection : 31/05/2016
- (v) Prev.inspection date :

PART-I : GENERAL INFORMATION

1. (a) **Mine Name** : GADIA SODO
- (b) **Registration NO.** : IBM/327/2011
- (c) **Category** : A Fully Mechanised
- (d) **Type of Working** : Opencast
- (e) **Postal address**
- State : GOA
- District : SOUTH GOA
- Village : CODLI
- Taluka : SANGUEM
- Post office : KIRLAPAL
- Pin Code : 403727
- FAX No. :
- E-mail : vijay.mehta@vedanta.co.in
- Phone : 832-2617200, 9923597238
- (f) **Police Station** : DHARBANDORA
- (g) **First opening date** : 01/01/1973
- (h) **Weekly day of rest** : SUN
2. **Address for correspondance** : Village: Codli, Post: Kirlapale, Dabal,
Taluka: Sanguem
Dist.: South Goa
3. (a) **Lease Number** : GOA0124
- (b) **Lease area** : 83.98
- (c) **Period of lease** :
- (d) **Date of Expiry** : 21/11/2027
4. **Mineral worked** : IRON ORE Main

5. Name and Address of the

Lessee : VEDANTA LIMITED
P.O.Box 125 Sesa Ghor, 20
EDC Complex Patto Plaza,
Panajim NORTH GOA GOA
Phone:0832-6713600
FAX :0832-6713721

Owner : D. D. JALAN
SESA GHOR, 20 EDC COMPLEX
PATTO PLAZA, PANJIM NORTH
GOA GOA
Phone: 9892800505, 083
FAX : 0832-2460690

Agent : SAUVICK MAJUMDAR
M/s V. S. DEMPO & CO. PVT.
LTD DEMPO HOUSE, PANAJI GOA
NORTH GOA GOA
Phone:
FAX :

Mining Engineer

Name : DHIRAJKUMAR NAMDEV JAGDISH, Full Time
Qualification : B.E (MINING)
Appointment/ : 29/02/2016
Termination date

Geologist

Name : MAHESH S. PATANKAR, Full Time
Qualification : M. Sc. Geology
Appointment/ : 01/08/2012
Termination date

Manager

Name : VIJAY MEHTA
Qualification : B Tech (Mining)
Appointment/ : 01/04/2012
Termination date

6. Date of approval of Mining Plan/Scheme of Mining	:	Renewal under rule 24 MCR1960	24/01/2007
		Modif.of approved Mining Plan	19/05/2008
		Modif.of approved Mining Plan	17/11/2009
		MP modif under MCR 1960	10/07/2015

PART - II : OBSERVATION/COMMENTS OF INSPECTING OFFICERS

Exploration :

Sl.No.	Item	Proposals	Actual work	Remarks
1a	Backlog of previous year	Nil, Mining operations were temporary closed as per Supreme Court Order in WP 435/2012.	Nil	
1b	Exploration over lease area for geological axis 1 or 2	Additional exploration was not proposed in modified mining plan.	Additional exploration is not carried out after re-commencement of mining operations in August 2015. Area explored under G-1 category. Total 253 boreholes were drilled with 17409m drilling with max depth of 222m.	
1c	Exploration Agencies and Expenditure in lakh rupees during the year	No proposal during the year.	Earlier exploration was carried out by company own exploration team.	
1d	Balance area to be explored to bring Geological axis in 1 or 2	Nil	Nil	
1e	Balance reserve as on 01/04/20	Reserves as on 01.04.2015 were 12.521 million tonnes under 111, 4.349 million tonnes under 211 category.	Reserves as on 01.04.2015 were 12.521 million tonnes under 111, 4.349 million tonnes under 211 category as per modified mining plan dated 10.07.2015.	
1f	General remarks of inspecting officers on geology, exploration etc	Nil	Nil	

Development :

Sl.No.	Item	Propasals	Actual work	Remarks
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2a	Location of development w.r.t.lease area	Development and production for insitu mining was proposed in southern face of pit-3.	Development and production for insitu mining is carried out in southern face of pit-3.
2b	Separate benches in topsoil, overburden and minerals (Rule 15)	Topsoil is not present in area. Separate benches in waste and ore are planned in pit-3.	Topsoil is not present in area. Separate benches in waste and ore are developed.
2c	Stripping ratio or ore to OB ratio	Planned Ore to OB ratio is 1.00.	Planned Ore to OB ratio is 2.01.
2d	Quantity of topsoil generation in m3	Nil	Nil
2e	Quantity of overburden generation in m3	Waste generation of 17.98 lacs m3 was planned.	Waste generation of 7.79 lacs m3 was achieved.
2f	General remarks of inspecting officers on development of pit w.r.t. type of deposit etc	Nil	The development above 56mRL is lacking or not carried out due to hard lateritic strata. Development in Pit-3 was carried out from 56mRL to -12mRL and advancement of benches is lacking on all development benches from top to bottom.

Exploitation:

Sl.No.	Item	Proposals	Actual work	Remarks
3a	Number of pit proposed for production	Development and production in one pit was proposed.	Development and production in pit-3 is carried out.	

3b	Quantity of ROM mineral production proposed	The total target of ROM production was 2880640 tonnes during 2015-16 as per capping on Environment clearance quantity. Quantity was increased to 3990723 tonnes during the year by DMG and therefore, modified mining plan was approved on 23.03.2016 for additional quantity.	Total 3460930 tonnes of ROM production was reported during the year.
3c	Recovery of sailable/usable mineral from ROM production	The recovery of ore from ROM was planned 100% after screening.	ROM quantity of 1462970 tonnes was despatched for processing and 1242884 tonnes of grade-wise production is reported after dry/wet process beneficiation. The recovery of ore from ROM is 84.95%.
3d	Quantity of mineral reject generation	Mineral reject of 210581 tonnes was proposed below 54% Fe.	Mineral reject is not reported in monthly return and salable grade is reported. Grade-wise despatch is 133110 tonnes.
3e	Grade of mineral rejects generation and threshold value declared.	Mineral reject of below 54% Fe was considered in modified mining plan. Threshold value is +45% Fe.	Wet processing of ore was carried out at plant located in Gurmel lease and recovery was 85%.
3f	Quantity of sub grade mineral generation.	Nil	Nil
3g	Grade of sub grade mineral generation	Nil	Nil

3h	Manual / Mechanised method adopted for segregating from ROM	Nil	Electric operated mechanical screen plants and wet process plant are in use for grade wise production of iron ore in lumps and fines in adjoining Gurmel lease.
3i	Any analysis or beneficiation study proposed and carried out for sub grade mineral and rejects.	Nil	Nil
3j	Provision of drilling and blasting in mineral benches	Occasional drilling and blasting was proposed for hard strata in laterite.	Hard strata in laterite encountered on southern face and it hampered advancement of face. 100mm dia holes have been drilled; but explosive is not available for blasting due to pending renewal of explosive magazine.
3k	Provision of mining machineries in mineral benches	Yes, backhoe excavators were proposed for excavation of ROM material. Dozer with ripper attachment is also used in hard strata.	Backhoe excavators of 1.1m ³ to 3.9 cum bucket capacity are used for excavation of ROM material. Development in waste is also without drilling & blasting with the use of dozers. There are two dozers of 405hp, 4 backhoe of 672hp, 3 wheel loaders of 223 & 318 hp, 25 dumpers of 55t and 20 dumpers of 39t.
3l	Whether height of benches in overburden and mineral suitable for method of mining proposed in MP/SOM	Bench height of 7m was proposed in waste and Ore.	Yes, maximum bench height is upto 6-7m. There are 12 benches in waste/OB and 10 benches in ore of which few are common due to trend of mineralisation. Working Pit top RL is 74m and bottom RL is -12m.
3m	Total area covered under excavation/pits	It is within existing pit and total 53.51ha area was proposed under different pits.	Total 53.96ha area is put in use under pit and additional area is not reported for degradation under pit.

3n	Ore to OB ratio for the pit/mine during the year.	Planned Ore to OB ratio is 1.00.	Planned Ore to OB ratio is 2.01.
3o	Total area put in use under different heads at the end of year	Area under pit- 53.51ha, area under dump-18.80ha, roads - 0.00ha.	Area under pit- 53.96ha, area under dump-23.28ha, plants 3.09ha, mineral stacks (State property) - 7.03ha and roads - 0.0a at the end of 2015-16.
3p	Production of ROM mineral during the last five year period as applicable	Proposed production was 9318000t, 5639000t, 0t, 0t, 3993723t from 2011-12 to 2015-16 respectively.	Actual production was 5161254t, 1953009t, 0t,0t, 3460930t from 2011-12 to 2015-16 respectively.
3q	General remarks of inspecting officers on method of mining etc.		

Solid Waste Management - Dumping:

Sl.No.	Item	Proposals	Actual work	Remarks
4a	Separate dumping of topsoil, OB and mineral rejects (Rule 32,33)	Separate temporary backfilling of waste inside the western pit was proposed.	Separate temporary backfilling of waste inside the western pit is carried out during the year 2015-16.	
4b	Location of topsoil, OB and mineral reject dumps	Separate temporary backfilling of waste inside the western pit was proposed.	Separate temporary backfilling of waste inside the western pit is carried out during the year 2015-16.	
4c	Number of dumps within lease area and outside of lease area	There is one dump within lease area and it is rehabilitated with plantation. Temporary backfilling is proposed for waste management.	No proposal for dumping of waste and temporary backfilling is carried out. Part southern dump has to be handled for advancement of faces as per proposal of 2015-16.	

4d	Location of dumps w.r.t. ultimate pit limit (Rule 16)	Proposal was to temporary backfill the waste inside the western pit to work in Pit-3. It is as per manual of mining plan to keep all the activities within lease area.	No proposal for dumping of waste and temporary backfilling is carried out in western pit due to existence pits lease area and limited area available for dumping.
4e	Number of active and alive dumps.	There is no active and alive dump.	There is no active dump within lease area for waste dumping.
4f	Number of dead dumps.	Southern Dump is matured and plantation has been done on it.	Southern Dump is matured and plantation has been done on it.
4g	Number of dumps established.	One	One
4h	Whether Retaining wall or garland drain all along dumps are there.	No proposal for 2015-16.	Yes, it is there on slope side of dump. Further handling of dump is proposed to advance the working benches of Pit-3.
4i	Length of Retaining wall or garland drain all along dumps	Nil	Nil
4j	Number of settling ponds	Nil	Nil
4k	Specific comments of inspecting officer on waste dump management	Nil	Nil

Solid Waste Management - Backfilling:

Sl.No.	Item	Proposals	Actual work	Remarks
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5a	Status of part or full extraction of mineral from mined out area before starting backfilling.	Due to paucity of area and restriction to dump the waste within lease area, it is proposed for temporary backfilling within western Pit.	Temporary backfilling has been carry out in western pit.
5b	Area under backfilling of mined out area	Mineral is persisting in all three pits and temporary backfilling is proposed in western pit. Void available in this pit is 440m X 170m x 24m.	Temporary backfilling is carried out in western pit from one end upto surface level. Total 1715952 t waste was backfilled. It is over 320m X 120m area and advancing upto surface level.
5c	Concurrent use of topsoil for restoration or rehabilitation of mineral out area (Rule 32)	Nil	Nil
5d	Total area fully reclaimed and rehabilitated	Nil	Nil
5e	General remarks of inspecting officers on backfilling and reclamation etc.	Nil	Southern dump was fully reclaimed and rehabilitated in the past. But it has to be re-handled for advancement of faces in Pit-3.

Progressive Mine Clousre Plan:

Sl.No.	Item	Propasals	Actual work	Remarks
6a	Whether Annual report on PMCP submitted on time and correctly. Rule 23 E(2).	There was no working in 2014-15 and PMCP report is submitted. It should be on or before 1st July every year.	PMCP report of 2015-16 is not became due as on date of report writing and it is not submitted for scrutiny.	

6b	Area available for rehabilitation (ha) .	Mineral is persisting in all three pits and temporary backfilling is proposed in western pit. Void available in this pit is 440m X 170m x 24m.	PMCP report of 2015-16 is not became due as on date of report writing and it is not submitted for scrutiny. Temporary backfilling is carried out in western pit from one end upto surface level.
6c	afforestation done (ha) .	Not proposed.	Not carried out.
6d	No. of saplings planted during the year	Nil	Nil
6e	Cumulative no .of plants	Nil	Plantation in Codli mine was reported in the past and separate information for Gadia Sodo lease is not available.
6f	Any other method of rehabilitation	Nil	Nil
6g	Cost incurred on watch and care during the year	Nil	Nil
6h	Compliance on reclamation and rehabilitation by backfilling (i) Voids available for backfilling (Lx B x D	Mineral is persisting in all three pits and temporary backfilling is proposed in western pit. Void available in this pit is 440m X 170m x 24m.	Temporary backfilling is carried out in western pit from one end upto surface level. Total 1715952 t waste was backfilled.
6i	Compliance on reclamation and rehabilitation by backfilling (ii) Voids filled by waste / tailings	Tailing disposal in pit was not proposed with Gadia Sodo lease. It was proposed in adjoining Maindvolicho lease TC 69/51 of Codli mine.	Tailing has been disposed in adjoining Maindvolicho lease TC 69/51 of Codli mine.
6j	Compliance on reclamation and rehabilitation by backfilling (iii)Afforestation on backfilled area	Nil	It is temporary backfilling.

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.	Nil	Nil
6m	Compliance of rehabilitation of waste land within lease (i) afforestation	Nil	Nil
6n	Compliance of rehabilitation of waste land within lease (ii) Area rehabilitation (ha)	Nil	Nil
6o	Compliance of rehabilitation of waste land within lease (iii) Method of rehabilitation	Nil	Nil
6p	Compliance of environmental monitoring (core zone and buffer zone)	Quarterly environment monitoring is required and report has to be sent to IBM Regional office.	Quarterly environment monitoring is carried out through own as well as private agency.

6q	General remarks of inspecting officers on PMCP compliance and progressive closure operations etc.	Mineral is persisiting in all the three pits and temporary backfilling is proposed in western pit. Production planning is in Pit-3. Therefore, specific proposals relevant to progressive mine closure plan are not there.	Nil
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Mineral Conservation:

Sl.No.	Item	Propasals	Actual work	Remarks
7a	ROM Mineral dispatch or grade-wise sorting within lease area	As per approved mining plan proposed ROM was classified as +60% Fe, +58-60% Fe, +55-58% Fe, +50-55% Fe, +45-50% Fe and below 54% Fe is considered as mineral reject due to market price.	The ROM ore was dispatched to Gurmel lease of Codli mine for wet process beneficiation and thereafter grade-wise production and despatch is reported in Monthly returns from December 2015 to March 2016. After amendment in rule 45 on 19th April 2016, lessee has not reproted grade-wise production, despatch and stock in April 2016 return. ROM production , despatch is reported along with grade-wise sale quantity.	
7b	Method of grade-wise mineral sorting i.e. manual or mechanical.	Mechanical processing i.e. dry screening and wet process beneficiation was proposed for grade-wise production and to upgrade the low grade ore respectively.	The ROM ore was dispatched to Gurmel lease of Codli mine for wet process mechanical beneficiation.	

7c	Different grade of mineral sorted out at mines.	The grade-wise production of -54% Fe and +54% Fe was proposed in modified mining plan.	The grade-wise production of below 55% Fe, +55-58%Fe, +58-60% Fe, +60-62% Fe and +62-65% Fe is reported in the monthly returns.
7d	Any beneficiation process at mines .	Mechanical processing i.e. dry screening and wet process beneficiation was proposed for grade-wise production and to upgrade the low grade ore respectively. It is located in Gurmel lease of Codli mine.	The ROM ore was dispatched to Gurmel lease of Codli mine for wet process mechanical beneficiation.
7e	General remarks of inspecting officer on Mineral conservation and beneficiation issues	Nil	Wet process beneficiation is carried out to upgrade the ore and tailing generated during operation has been dumped in the adjoining lease. The total quantity of tailing generation is 220086 tonnes as per monthly return by estimating from ROM despatch quantity (1462970t) and grade-wise production (1242884t).

Environment:

Sl.No.	Item	Proposals	Actual work	Remarks
8a	Separate removal and utilization of topsoil (Rule 32)	Nil, Topsoil generation is not there in the area.	Nil, Topsoil generation is not there.	
8b	Concurrent use or storage of topsoil	Nil	Nil	

8c	Separate dumps for overburden, waste rock, rejects and fines (Rule 33)	Proposal was to temporary backfill the waste inside the pit due to non-availability of other area for dumping and mineral is persisting in all the pits.	Temporary backfilling is started during the year.
8d	Use of overburden, waste rock, rejects and fines dumps for restoring the land to its original use	Nil	Nil
8e	Phased restoration, reclamation and rehabilitation of lands affected by mining operations (Pits, dumps etc)	Nil	Southern Dump has been planted with trees and not being used for additional waste dumping. Part of the waste material from southern dump has to be handled for face advancement as per planning; but it is lacking.
8f	Baseline information on existence of plantation and additional plantation done (Rule 41)	Existence of plantation is there on slopes of the dump, along the office road and other part of lease area. Additional plantation is not proposed during the year.	Additional plantation is not carried out during the year 2015-16.
8g	Survival rate	Not applicable.	Not applicable.
8h	Water sprinkling on roads to control airborne dust	Yes, it is proposed for waster sprinkling on haul roads.	There are nine water tankers in Codli mine of different capacity. Seven are of 8000-9000 litres and two are of 28000 litres. Water sprilknlng on road is observed during the inspection.

8i	General remarks of inspecting officer on aesthetic beauty in and around mines area	Nil	Surrounding area beyond lease area is lush green and lessee has carried out plantation on dump, near office building etc.
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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 return of mine for year 2014-15 submitted in hard copy. Monthly returns are submitted in online system upto April 2016.	All the monthly returns are submitted online and annual return in hard copy.	
9b	Scrutiny of Annual return for information on Mining Engineer, Geologist and Manager	The mine was closed during 2014-15 since last two years. Annual return of 2015-16 not yet became due and not received for scrutiny.	Shri Dhirajkumar Jagdish is mining engineer since 29.02.2016. Shri Mahesh Patankar is geologist since 01.08.2012 and Shri Vijay Kumar Mehta is Mines manager since 01.04.2012. Previously Shri Claerance Desouze was mining engineer in mines as per AR 2014-15. All these appointment are for the Codli mine and not for individual lease of Gadia Sodo. There are three-leases in Codli mine.	
9c	Scrutiny of Annual return on land use pattern for area under pits, reclaimed area, dumps etc.	Area under pit 53.5833ha, area under dump 22.2718ha and plant 3.4659ha, stacks 0.0ha.	Land use pattern as per approved modified mining plan. Area under pit 53.9656ha, area under dump 23.2813ha and plant 3.0946ha, road 0.4293ha.	
9d	Scrutiny of Annual return on afforestation	Common detail for Codli mine was indicated in AR 2014-15.	Total 30 trees with ML and 1725 outside ML were reported in AR 2014-15. Mine was temporary closed during 2014-15.	
9e	Scrutiny of Annual return on mineral reject generation (Grade and quantity)	It was zero during the year 2014-15.	Mine was temporary closed during 2014-15.	

9f	Scrutiny of Annual return on ROM stock and/or graded ore	ROM opening stock from opencast workings - 1787719t, Production - 0t and closing stock - 1787719t. Grade-wise opening stock of below 55% Fe lumps- 73364t, Production - 0t and closing stock - 72513t. below 55% Fe fines- 353181t, Production - 0t and closing stock - 349655t. 55% to 58% Fe lumps - 145305t, Production - 0t and closing stock - 10431t. 55% to 58% Fe fines - 375187t, Production - 0t and closing stock - 101651t.	All the stocks were taken under possession of State Government for e-auction as per Supreme Court Order.
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- 9g Scrutiny of Annual return on sale value, Ex. Mine price and production cost AR of 2014-15 is having Ex mine price of Rs. 714 and 1484 for lumps and fines below 55% Fe. Ex mine price of Rs. 627 and 270 for lumps and fines +55-58% Fe. Ex mine price of Rs. 1078 and -0 for lumps and fines +58-60% Fe. Ex mine price of Rs. 759 and 1471 for lumps and fines +60-62% Fe. All the stocks were taken under possession of State Government for e-auction as per Supreme Court Order. Ex. mine price is estimating after deducting transport cost, loading/unloading charges and other charges; which looks on higher side. The transport cost of 200, 155, 155, 237, 194, loading/unloading charges of 135, 225, 135, 237 and 177 and other charges of 135, 50, 248, 281 and 187 were reported from December 2015 to April 2016.
- 9h Scrutiny of Annual return on fixed assets AR of 2014-15 is having Fixed assests detail is given for lands, industrial building and machineries and own capital as source of finance. Reserves and surplus amount was 1,20,824,639. It is common for Codli mine and capital structure is common for Vedanta Limited.
- 9k Scrutiny of Annual return on mining machineries AR 2014-15 has given 8 backhoe, 2 motor grader, 5 wheel loader. dumpers - 40, cranes - 4, dozer - 4 Following machinries are in use at mines. Dozer 2 Nos. of 405hp (contract), Back Hoe 4 Nos. of 672hp), Wheel loader 3 Nos. of 318hp, Dumper 25 Nos. of 55 tonner, Dumper 20 Nos. of 39 tonner, Water Tanker 9 Nos. of 8000 ltrs to 28000 liters, Utility Vehicle 2 Nos and Crushing/screening Nil
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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
Rule 13(1)	15/06/2016				
Rule 45(5)	15/06/2016				

Date :

(JANGID G K)

Indian Bureau of Mines