Brief Description of Tarmi OCP

1 Introduction

Tarmi Opencast Project (1.0 MTPA) is an operating coal mine under Dhori Area of Central Coalfields Limited, which was started after obtaining Environmental Clearance vide letter No.J-11015/219/2007-IA.II(M) dated 20.04.2010 in project area of 258.70 Ha.

In the preceding two years (2015-16 & 2016-17), coal production was nil on account of land related issues including forest land. Prior to that from 2010-11 to 2014-15 total 3.99 MT coal was produced. The previous coal production is given below.

Sl No	Year	Coal Production (MT)	OB (Mm^3)
1	2010-2011	0.17	0.48
2	2011-2012	1.16	2.41
3	2012-2013	1.70	2.60
4	2013-2014	0.87	1.61
5	2014-2015	0.095	0.06
6	2015-2016	0.00	0.00
7	2016-2017	0.00	0.00
Total		3.99	7.17

2 Purpose of present proposal

This project has attained prior environmental clearance of 1.0 MTPA vide letter No.J-11015/219/2007-IA.II(M) dated 20.04.2010. However, the project has come under violation as production exceeded the approved EC limit in the years 2011-12 and 2012-13. This proposal is being submitted to obtain clearance due to violation as per MoEF notification no: S.O. 804 (E) dt. 14.03.2017.

3 Present Status of Mine

The mine management stopped coal production with effect from financial year 2015-16 onwards till data mainly on account of forest land related issues.

4 Identification of project & project proponent

The project under consideration, i.e. Tarmi OCP is administratively under Dhori Area of CCL headed by General Manager, Dhori Area. Geologically, it falls in East Bokaro Coalfield in Bokaro District of Jharkhand.

The mailing address of the Project Officer is given below:

Project Officer
Tarmi OCP, Dhori Area, CCL
Post- Turiyo, Dist.-Bokaro, State- Jharkhand, PIN-829132

5 Location & Communication

Tarmi block is located in eastern part of East Bokaro Coalfield. It occupies an area of 3.0 km2 and lies between the latitudes 23o45'25" & 23o46'45" N and longitudes 86o02'55" & 86o03'35" E.

Bhandaridah railway station of South Eastern Railway on Gomoh-Barkakana-Dehri-On-Sone Loop Line of Eastern Railway is located just outside this block. The Chandrapura and Phusro Railway Stations are located to the East and West of Tarmi Block at distances of 6.0 kms and 10 kms respectively.

The East-West running Gomia-Jarangdih-Phusro-Jaina More road, which meets the Bisnugarh-Petarwar Road and Dhanbad Ramgarh Road, connects the Coalfield with Hazaribagh, Dhanbad and Ranchi. This road is located to the south of Tarmi Block. The nearest commercial Air Port is at Ranchi at a distance of about 130 km. Hazaribagh is at a distance of about 80 km from the project. Refer location plan & topo-sheet plan.

6 Climate & Rainfall

The climate is extreme. The summer, which is between April and June, is very hot. The maximum temperature reaches upto 46^0C during summer and the minimum temperature reaches 4^0C during winter months of December and January. The average annual rainfall is usually about 1250 mm.

7 Topography & Drainage

The surface topography of the Block is rugged and is represented by the presence of pronounced hills and valleys. The ground level varies from 330 m. in the north-west to 215 m. in the south near the Railway line. The drainage of the block is controlled by two nallas flowing north to south and located in the western and central parts of the block. The nallas join river Damodar in the south. This river serves as a perennial source of water to the area.

8 Importance of project

Central Coalfields Limited is facing increasing demand of coal because of increased demand from industry and power sector. Continuing and augmentation of coal production from the mines of CCL will help to bridge the gap of demand and supply of coal in India. To meet the growing demand of coal, especially in power and steel sectors, CCL has planned to increase its production capacity from 67.04 Mt. of coal during 2016-17 to 133.50 MTPA by 2019-20. Augmentation of capacity at Tarmi OCP will help CCL in meeting

the growing demand of power grade coal in country and to fulfill the target of one billion tonne coal production of CIL.

9 Mining System

The quarry is proposed to be worked by inclined slicing method. The benching would be made parallel to the roof and floor of the seam. The height of the OB benches would be 10-12m and the height of the coal benches would be equal to the thickness of the seam. Considering the technical parameters of the quarry, i.e. gentle gradient of the seam (5-10 degree), moderate strike length and a total life of the project (13 years), shovel Dumper Mining System was proposed for this project as per approved PR of 1.0 MTPA capacity.

The width of the working and non-working benches is 40 m and 25 m respectively. With this system of mining, the running slope of the quarry will be 12 degree To 15 degree corresponding to an ultimate slope of 37 degree.

10 O.B Dumps

O.B Dump for Quarry-1

The total volume of OB to be removed from the Quarry-1 is 7.84 M.Cu.m. Out of this, 1.85 M.Cu.m was to be dumped externally and the balance 5.99 M.Cu.m was to be dumped internally. The external dump marked as 'A' on the above plan was proposed to be made in the non-forest area, as shown in the plan. The external dumping was to be made up to 4^{th} year of quarry operation, after which only internal dumping was to be done. However, due to non-acquisition of site for external dump, the dumping was done in the void of Selected Dhori OC, lying just East of Quarry-1.

Dumping for Quarry-2

The total volume of OB to be removed from Quarry-2 is 16.45 M.Cu.m. Out of this, 2.35 M.Cu.m will be dumped externally and the balance 14.10 M.Cu.m will be dumped internally partly inside the void of its own and partly in the void of quarry-1. Out of this, 7.60 M.Cu.m of OB will be dumped in the decoaled area of Quarry No.1 and the balance 6.50 M.Cu.m will be dumped internally in Quarry No.2 itself.

Dumping for Quarry-3

The total volume of OB to be removed from Quarry-3 is 5.12 M.Cu.m. The entire volume of 5.12 M.Cu.m will be dumped internally partly inside the void of its own and partly in the void of quarry2. Out of this, 3.90 M.Cu.m of OB will be dumped in the decoaled area of Quarry-2 and the balance 1.22 M.Cu.m will be dumped internally in Quarry-2 itself.

The top RL of external dump 'A' is +310m. with a total area being 0.25 Sq.Km. The top RL's of the internal dumps B, C and D are +290m, +290m and +230m respectively.

The minimum quantity of OB which is to be dumped externally before internal dumping can be started in Quarry-1 is 4.20 M.Cu.m

Capacity of OB Dumps

Dump	Type	Capacity(Mcum)	Top RL(m)
A	External	4.20	+310
B	Internal	13.59	+290
C	Internal	10.40	+290
D	Internal	1.22	+230

Quarry Wise Dump Management Plan

Quarry	Total OBR (MCum)	Dump-A (Max RL +310m)	Dump-B (Max RL +290m)	Dump-C (Max RL +290m)	Dump-D (Max RL +230m)
1	7.84	1.85	5.99	-	-
2	16.45	2.35	7.60	6.50	-
3	5.12	-	-	3.90	1.22
Total	29.41	4.20	13.59	10.40	1.22

11 Mine boundary

Northern Boundary	The quarry floor in the north for quarry No.1, 2 and 3 has been fixed along the outcrop of Seam which is the bottom-most seam of the quarry.
Southern Boundary	**Quarry-1** The quarry floor in the south for quarry No.1 has been fixed partly along fault F7 in the area where working width between fault F7 and F8 is more than 100m and partly along fault F8 where surface boundary is more than 60m from Selected Dhori quarry 3. In the remaining part of the quarry1 the surface boundary has been fixed leaving a surface barrier of 60m from Selected Dhori quarry 3. **Quarry-2** The quarry floor in the south for quarry No.2 has been fixed along fault F5. **Quarry-3** The quarry surface in the south for quarry No.3 has been partly fixed leaving a surface barrier of 60 m from Ambakocha OCP. The remaining southern surface boundary is the resultant of floor boundary fixed along fault F4 due to presence of a hillock near borehole MBT-5.
Eastern Boundary	The quarry floor boundary in the east for quarries.1,2 & 3 has been fixed along the outcrop of seam-III. In case of quarry 2 &

	3, part of the eastern floor boundary lies along the faults F1 and F5 respectively.
Western Boundary	**Quarry-1** The quarry floor in the west for quarry No.1 has been fixed along the block boundary. **Quarry-2 & 3** The quarry floor in the west for quarry No.2&3 has been fixed leaving a surface barrier of 60m from Selected Dhori Quarry 2&3.

12 Geological & Mining Characteristics of Quarriable Block

The geological and mining characteristics of the quarriable blocks are given below. From the table, it may be seen that the seams occurring within the quarriable blocks are gently dipping (5 deg.-10 deg.) with varying thickness and maximum depth being 35m, 75m and 40m in quarry No-1, 2 and 3 respectively.

Mining & Geological Characteristics of the Quarry

Sl. No.	Partriculars	Unit	Thickness Range	Average Value
1.	Seam Thickness	M		
Quarry-1				
A	Seam V	"	0.64-4.93	2.5
B	Seam III	"	3.84-7.22	4.50
Quarry-2				
A	Seam V	"	0.95-4.57	2.9
B	Seam III	"	3.05-6.3	4.7
Quarry-3				
A	Seam V	"	1-1.92	1.7
B	Seam III	"	3.15-6.34	4.8
2.	Seam Gradient	Degree		5-10 deg
3.	Specific Gravity of the seams	Te/m3		1.55-1.70
4.	OB Volume weight	Te/m3		2.40 (approx.)
5.	Av. Strike length of the quarry	Km		
	Quarry1	"		1.3
	Quarry2	"		1.2
	Quarry3	"		0.8
6.	Maximum depth of the quarry surface	M		
	Quarry1	"		35
	Quarry2	"		75
	Quarry3	"		40
7.	Surface quarry area	Ha.		
	Quarry1	"		53.54
	Quarry2	"		63.18
	Quarry3	"		30.77

12.1 Mineable Reserve & Life of Mine

Two seams namely, Seam-III and Seam-V are occurring within the quarriable blocks of Tarmi OCP. The mineable reserves of the above 2 seams for all three quarries are given below. A geological loss of 10% and a mining loss of 15 cm coal thickness in floor and roof of the seams have been considered in the estimation of the mineable reserves of the seam.

Quarry	**Mineable Reserve**		
	Seam-III	Seam-V	Total
Quarry-1	2.82	1.17	3.99
Quarry-2	4.01	1.67	5.68
Quarry-3	1.75	0.21	1.95
Total	8.58	3.05	11.63

Volume of OBR

Partriculars	**Quarry-1**	**Quarry-2**	**Quarry-3**	**Total**
Volume of O.B (MCum)	7.84	16.45	5.12	29.41

12.2 Void Creation & Management

The void left at the end of mine life is about 15.71 Ha , which is around 6.32 % of the project area of 248.70 Ha (project area excluding colony over 10 Ha, which is outside core zone). The void so formed will be left as water body. Please refer Final Stage Plan.

13 Water Demand

Purpose	Peak Demand (m3/day)
A. Mine site	Tarmi OCP
1.Mine operation	-
2.Land reclamation	180
3.Dust suppression	180
4.Drinking	7
5.Green belt	5
6.CHP	38
7.Washeries	-
8.Workshop	63
9.Fire service	77
10.Others (specify)	-
Total (A)	550
B. Township	
1.Green belt	12
2.Domestic	57

3.Other (Service Building like GM office, Guest house, Hospital, Club, School etc)	12
Total (B)	81
Grand Total (A+B)	631

(Source: mine water of Tarmi OCP)

Mine Water Seepage: The mine water seepage of Tarmi OCP in non-monsoon period is about 80.85 MGal/ annum (1006 cum/day).

14 Source of Electrical Power Supply

CCL Regional Sub-Station at Kargali is receiving power from DVC BTPS through a 15 km long ACSR 'DOG' conductor. Dhori area is receiving power from Kargali through 10 MVA 33/11 kV sub-station. The whole area is receiving power from this sub-station. Maximum demand of Dhori area is 8 MVA. It is proposed to feed power to Tarmi OCP at 11 KV by tapping the 11 KV OHT line of Dhori Check Post S/S.

15 Coal Handling & Dispatch System

ROM coal will be crushed (-100mm) at two pit top feeder breakers. Two separate streams are proposed for crushing and loading of washery grade and power grade coal with 1 feeder breaker each and Truck Loading Hoppers respectively. Crushed coal will be dispatched through existing nearby Railway Siding.

16 Description of the Environment

Ambient Air Quality of main parameters as per routine monitoring is given below.

Year	Quarter	Concentration in μ gm/m^3				Remarks
		PM_{10}	$PM_{2.5}$	SO_2	NO_X	
2010-11	June'2010	166.33	67.33	10.33	37.33	0.17 MTPA coal production
	Sep'2010	71.00	39.33	10.00	38.00	
	Dec'2010	153.33	79.00	10.00	35.00	
	March'2011	280.00	107.00	10.00	39.66	
	Average for 4 Qtrs	**167.67**	**73.17**	**10.08**	**37.50**	
2011-12	June'2011	268.66	98.66	10.66	39.33	1.16 MTPA coal production
	Sep'2011	116.33	78.33	10.33	39.33	
	Dec'2011	243.66	127.00	10.00	42.00	
	March'2012	248.66	95.66	10.33	40.00	
	Average for 4 Qtrs	**219.33**	**99.91**	**10.33**	**40.17**	
2012-13	June'2012	288.66	84.66	10.00	40.33	1.70 MTPA coal production
	Sep'2012	115.00	49.33	10.66	44.33	
	Dec'2012	191.00	104.33	11.00	42.66	
	March'13	252.00	95.66	10.66	44.66	
	Average for 4 Qtrs	**211.67**	**83.50**	**10.58**	**43.00**	

2016-17	June'2016	83.33	40.33	<25	<6.00	No coal production
	Sept' 2016	87.33	32.33	<25	<6.00	
	Dec' 2016	85.66	35.00	<25	<6.00	
	March' 2017	91.58	46.83	<25	6.25	
	Average for 4 Qtrs	**86.98**	**38.62**	**<25**	**6.06**	

Ambient Noise Level Observations as per routine monitoring

Year	Type of station	Average ambient noise level in dB (A)					Permissible Limit dB (A)
		June	Sept	December	March	Average	
2010-11	Industrial	51.20	42.60	42.60	46.00	45.60	
	Residential	49.00	48.90	48.50	48.00	48.60	
2011-12	Industrial	47.00	47.80	42.50	47.20	46.13	
	Residential	46.00	49.90	48.70	49.30	48.48	
2012-13	Industrial	49.50	48.60	49.80	47.40	48.83	
	Residential	55.00	54.20	54.00	50.30	53.38	
2016-17	Industrial	49.50	48.60	49.80	47.40	48.83	
	Residential	55.00	54.20	54.00	50.30	53.38	

Present Water Quality Status as per on routine monitoring

Parameters	Annual average level as per on routine monitoring (mg/l)				MoEF Sch-VI Standard
	2010-11	2011-12	2012-13	2016-17	
pH	7.99	8.55	8.04	7.96	5.5-9.0
TSS	47.50	46.50	40.50	34.58	100.0
Oil & Grease	2.00	2.00	2.00	<2.00	10.0
COD	76.25	82.50	67.50	48.00	250.0
BOD(3 days at 27^0 C)	1.00	1.00	1.00	2.00	30.0
Iron as Fe	<0.06	BDL	BDL	<0.06	3.0
Fluoride	0.55	0.54	0.51	0.64	2.0

NOTE: The concentration of all parameters except pH is in mg/l.

Conclusion:

The above table indicates that the mine water discharged into the local drainage fully conforms with MoEF&CC Schedule-VI standard, for discharge into surface water bodies.

16 Stage-wise land-use and reclamation plan (Ha)

The final land use plan (Post mining) is given in Table below.

Land use during mining		Post-mining land use	
Particulars	Area (Ha)	Particulars	Area (Ha)
Quarry	147.51	Backfilled Area Reclaimed With Plantation	116.65
		Landscaped quarry batter	20.28
		Void Converted to shallow water body	10.58
Industrial Area	1.99	Future use of CCL/ public use	1.99
OB Dump	21.19	Undisturbed Land in Public Use	21.19
Haul Road	3.45	Future use of CCL/ public use	3.45
Other Roads	3.94	Public Use	3.94
Safety Zone	19.46	Green belt of 20 m width	19.46
Safety Zone	51.16	Ground Water Recharge Pit	1.32
		Undisturbed Land in Public Use	49.84
Colony outside core zone	10.00	Public use	10.00
Total	258.70	Total	258.70