

MINUTES OF 50th EXPERT APPRAISAL COMMITTEE (EAC) (THERMAL & COAL MINING) MEETING HELD ON 18th-19th JUNE 2012 IN SCOPE COMPLEX, LODI ROAD, NEW DELHI.

COAL MINING PROJECTS

The 50th meeting of the reconstituted EAC (T &C) was held on 18th-19th June 2012 in SCOPE Convention Centre, SCOPE Complex, New Delhi to consider the projects of coal mining sector. The list of participants of EAC and the proponents are given at Annexure-1 and 2 respectively.

Confirmation of minutes

The minutes of the 49th meeting of EAC (T&C) held on 14th-15th May 2012 was confirmed.

The agenda items were taken up as given below:

1. Durgapur II/Sariya Coal Block (2 MTPA) of M/s DB Power Limited, located in Mand-Raigarh Coalfields, District Raigarh, Chhattisgarh (Further consideration of EC based on TOR granted on 23.10.2008)

The project was earlier considered in EAC meeting held on 23rd-24th April 2012 and issues therein were further considered. The proponent made a presentation. On the matter of progressive and final mine closure plan and habitat restoration, the proponent informed that the mined out area would be completely backfilled up to ground level and reclaimed with the plantation consisting of native species like Sal, Mahua, Neem, Siris, Acacia, Mango etc. It was informed that bamboo and grass would be planted as a part of Habitat Restoration for elephants occasionally visiting the study area. It was clarified that there would be two temporary OB dumps in the mineralised area with an estimated OB of 93.77Mm³ to be dumped externally, of which 86.87 Mm³ would be dumped in west pit and the balance 6.90 Mm³ dumped over east pit. The height of surface dump would be about 80m till the 14th year and would reach 100m during 15th year and reduced to 80m again during the 16th year of mine operations. It was informed that an estimated 20.45Mm³ of OB would be stored in the backfilled area of 300 ha which would be 10m above ground level. The entire OB stored in external OB dumps would be re-handled and backfilled into the decoaled void of an area of 517.48 ha up to ground level. The proponent agreed to develop a 50m thick 3-tier plantation (after extraction of coal) in the area between the mine and township & mine and agricultural fields to act as a shield against fugitive particulate emissions from the mine operations. It was further informed that an amount of Rs 30 lakhs has been earmarked for Wild Life Conservation Plan vide letter dated 26.04.20012 to PCCF over and above a total budget of Rs 7.17 crores for the implementation of Wild Life Conservation Plan. The proponent agreed to dovetail the project specific WL Conservation Plan with a Regional WL Conservation Plan to be prepared by the State Govt. and in consultation with BALCO, who would be operating the adjoining Durgapur–Taraimar Coal mine, to ensure free movement of animals through coal mines between adjoining forests in the study area. It was informed that the matter of establishing a private railway siding is being pursued with the railway authorities, as the existing one at Kharsia is about 70 km away from the mine. It was informed that a Pre-Feasibility Report has been prepared for laying the railway track and a survey of the area is going on. It was clarified that the railway line would not be through villages of Dharmajaigarh. The proponent agreed to transport coal by road using covered 30-T trucks for the initial five years until the railway line was operational. The proponent also informed that the State Government is also proposing to construct a dedicated 4-lane BOT (Built-Operate-Transfer) road for transportation of coal from mines of the region for which a tender stands

already floated. It was informed that Stage-I Forest Clearance has been applied for and site inspection is expected to be carried out shortly. It was informed that the loading at railway siding would be carried out by hopper/mechanical loading system. Proponent informed that land acquisition for the project would be carried out as per State Government norms under various regulations. It was also informed that presently the R&R Plan has been forwarded to the Collector, Raigarh (Chhattisgarh) on 15.05.2012 for approval and also sent to Mineral Resource Dept. for Raipur for comments. Of the total Rs 63.56 crores earmarked for R&R Policy, Rs 7.70 crores is for Tribal Development Plan (TDP) and Rs 10 crores for CSR. It was informed that a Committee has been constituted for implementation and monitoring of CSR. There are only 21 Tribal PAFs belonging to Taraimar village, who require relocation. The 119 PAPs (including land losers) consist mainly of ST and would be compensated as per the provisions of the Panchayat Extension in Scheduled area (PESA) Act, 1996. It was informed that approval of the Gram Panchayat has been obtained land for building a Hospital in the area. The Committee was informed that a Writ Petition No. 3876 of 2011 has been filed in the Hon'ble High Court of Chhattisgarh at Bilaspur against the proposed mining project in Dharmajaigarh Nagar Panchayat Area and the Hon'ble High Court of Chhattisgarh had issued Ex-parte Interim Order on 9.12.2011 banning consideration of the environmental clearance, which had been subsequently vacated on 03.01.2012. Representations dated 27.02.2011 against the project, which were received in the Ministry from residents of Dharmajaigarh Township and village had been circulated in advance to the EAC members and to the proponent for consideration in the meeting. The proponent also made a detailed presentation on the issues raised in the representation.

The Committee recommended reintroduction of species from the pre-mining ecosystem and use of species of minor forest produce such as Amla (*Embelica officinalis*), Char or Chironji (*Bucchnania lanzen*), Baheda (*Terminalia bellirica*) for Habitat Restoration. The Committee recommended development of a thick 3-tier green belt along side roads, habitation and township. The Committee desired that laying of railway track for coal transportation should take into consideration the requirements of other mines coming up in the area. The Committee reiterated that coal transportation by road should be permitted only for a period of 5 years only.

The Committee observed that coal transportation even via a dedicated road would cause considerable air pollution to adjoining habitations/villages from coal dust due to spillages and desired that rail mode of transportation should be introduced at the earliest. The Committee desired that the proponent use mechanically covered trucks for coal transportation and also participate in the development of avenue plantation along the 70 km stretch of the dedicated coal transportation road, in consultation with State Government. The Committee desired that areas between the road and habitation/villages should also be provided with 3-tier green belt.

The Committee desired that the approved copy of R&R Plan should be submitted to Ministry for record. The Committee desired that the proponent also engage experts in occupational health. The Committee also desired that proponent should adopt a "**Corporate Environment Policy**" for protection of Environment as per MOEF Circular dated 26.04.2011 and details furnished to the Ministry for record. The Committee also desired that issues of safety should also be incorporated in the Corporate Environment Policy. The Committee desired that two external experts should be included in the monitoring of implementation of CSR and may contact Bilaspur University and Sagar University in this regard. The Committee desired that the Tribal Rehabilitation Colony should be provided with fruit trees such as Jackfruit, Lemon, Mahua, Mango and tree species of minor forest produce, including bamboo. The proponent must facilitate multi-species agriculture to be also undertaken in the area.

The Committee recommended environmental clearance to aforesaid project subject to furnishing the aforesaid details for record of the Ministry. The Committee stated that the EC recommended is, however, subject to final outcome/Order/Judgement of the Hon'ble High Court and also subject to Stage-I forestry clearance.

2. Radhikapur (West) OC (5.3 MTPA) and UG Coalmine Project (0.7 MTPA) (combined 6 MTPA in an ML area of 1047.99 ha) and Pit-Head Coal Washery (6 MTPA) of M/s Radhikapur (West) Coal Mining Pvt. Ltd., located in Tehsil Chendipeda, dist. Angul, Orissa - Further consideration of EC

The proposal was earlier considered in EAC meeting held on 19th-20th March 2012 and the issues/clarifications sought therein were further considered.

The proponent made a presentation. The details of annual sharing of 6 MTPA coal among the three allocatees of the JV consisting of M/s Rungta Mines Ltd. (4.06026 MTPA) (67.671 %), M/s Ocean Ispat Pvt. Ltd (1.05798 MTPA) (17.633 %) and M/s OCL India Ltd. (0.88176 MTPA) (14.696%), was informed. The status of the linked Thermal Power Plants/DRI Plants of the JV was also presented. It was informed that the ultimate depth of the mine void would be reduced at the end of 28th year to 40m below ground level, by re-handling and backfilling 22.4 Mm³ OB from East crown dump and 24.23 Mm³ OB from West crown dump and thereby reducing height of both the crown dumps from 85m to 52m. This would sufficiently reduce the requirement of additional land for external OB dumps from 100 ha to 52.66 ha of 90m height to accommodate 26.31 Mm³ of OB generated during the initial 4 years of mine operation. A copy of the Order issued by Govt. of Orissa vide letter no. 1275 dated 24.02.2012, banning acquisition of additional land over and above coal-bearing area of allocated block, was furnished for infrastructure and for creation of external OB dumps outside coal blocks. The proponent explained the background in which the State Govt. issued the Order stating that the issuance of the Order was necessitated by the fact that a large number of mines are operating in the area and the proponents were occasionally found to be using coal bearing areas or areas where dedicated roads/rail were to be constructed for the entire coalfield for creation of external OB dumps. It was informed that the embankment design prepared by M/s GMS Power Packs Pvt. Ltd. at the cost of Rs 6.5 lakhs has yet to be approved by the Water Resource Department, Govt of Orissa. It was stated that a project specific R&R plan has been prepared for a total cost of Rs 239.8150 crores as part of the EIA/EMP Report. It was clarified that the R&R Plan for a total 3714 PAFs would be implemented as per R&R Policy of Orissa State Govt. It is proposed to shift the PAFs after 6th year. The Plan is yet to be approved by the State Govt. and an R&R site is yet to be identified. It was informed that a provision of Rs 3 crores (capital cost) and Rs 3.09 crore (recurring cost) has made for CSR till end of mine life. Capital cost of project is Rs 850 crores. The issues raised during Public Hearing were presented.

The Committee desired that the depth of final void area should be further reduced by dumping OB into the final void and requested the proponent to re-examine the matter. The Committee desired that additional land, over and above the coal bearing area even within allocated coal blocks should not be permitted for dumping of OB unless it is not feasible due to high stripping ratio. The Committee was of the view that proponents of coal mine projects must explore the feasibility of backfilling to the extent possible and only thereafter prepare Mining Plans for dumping OB externally in non-coal bearing areas or areas with very thin seams.

The Committee observed that R&R Plan under section 4 (1) is yet to be approved. The Committee desired that a detailed R&R Plan along with an Implementation Schedules with time scales for shifting of

PAFs should be provided as there is a huge displacement of 1664 PAFs involved. The Committee desired that the details of CSR - villages, population to be covered under CSR, their socio-economic status, extent of SC/ST, etc, which could be obtained from the data of latest Census 2011, should form the basis for preparation of CSR Plan, based on which the schemes/measures under the CSR Plan to address the specific needs of the local communities should be prepared. The Committee desired that the CSR Plan should cover long term benefits for the destitute and vulnerable persons in the community. The Committee also desired that two external experts of nearby reputed institutions/universities should be included in the implementation and monitoring of CSR Plan. The Committee also desired that the capital cost of CSR should be increased from Rs 3 crores to Rs 4 crores and after commissioning of the mine to spend Rs 5/T annually till end of mine life.

The Committee discussed the issues raised during Public Hearing regarding noise level monitoring, minor irrigation project proposed for the area earlier, health of people, discharge of effluents in Singhara Jore, implementation of the new R&R Policy of State Govt. etc. The Committee sought details of the minor irrigation project, which was proposed to come up in the area, but was shelved in favour of the coal block and desired that a Social Cost Benefit analysis should be carried out for undertaking mining vis-à-vis continuing practice of agriculture in the area. The study should *inter-alia* include details of the command area, cropping pattern (irrigated/non-irrigated), details of people losing land particularly agricultural land.

The Committee observed that as the project is in the vicinity of Talcher area which is a 'Critically polluted area'; and desired that the proponent dovetail the mitigative measures identified in the Env. Action Plan for Talcher with the EMP prepared for the project. In this context, the proponent agreed to provide settling pond in 5.5 ha land as per OSPCB norms for treatment of mine effluents before discharge into the natural waters. The Committee desired that the regular monitoring of Singhara Jore water, up-stream and down-stream should be carried out and monitoring reports should be furnished and data should be displayed on company web site. The Committee desired that 50m width green belt should be provided (after coal extraction) instead of the statutory 7.5m in areas close to habitations, villages, etc. The Committee observed that a dedicated coal transportation corridor is in place but the proponent has not paid for an internal corridor as per OSPCB directions.

The Committee desired that all the companies operating in Talcher Coalfields should make joint efforts to protect the Singhara Jore and its flow (maximum and minimum), which should be monitored regularly. The embankment along the Singhara Jore should be protected and strengthened. No mining should be carried out beneath the Singhara Jore. The Committee recommended that the MOEF should write to the State Government for restoration of Singhara Jore with emphasis on monthly monitoring of flow of the Jore and the funding of this exercise should be by the project proponents. The Committee also suggested that an assimilation study be carried out by the project proponent.

The Committee after discussions decided to further consider the proposal upon receipt of the aforesaid details.

3. Suliyari Belwar Opencast Coal Mine Project (Ph-I) (5 MTPA normative and 6 MTPA peak in a total Project area of 1080.99 ha) of M/s A.P. Mineral Dev. Corp. Ltd., located in dist. Singrauli, M.P. (TOR)

The proponent made a presentation. The proposal is for opening a new opencast coalmine of 5 MTPA (normative) and 6 MTPA peak in a total project area of 1080.99 ha in Singrauli Coalfields. The Ministry of Coal allotted 1298 ha of Suliyari Belwar Coal Block in the southern part of Singrauli Coalfield vide MOC letter no. 13016/8/2007-CA-I Dated 25.07.2007. The coal produced is for meeting the requirement of APGENCO. It was informed that the project is at a distance of about 70km from the Singrauli Critically Polluted Area. Of the total project area, 513.11 ha is Govt. land, 567.88 ha is private land. No forestland is involved. Of the total project area, 807.86 ha is quarry area, 165.82 ha is for safety barrier, roads, etc, 27.81 ha is for service buildings, 7.28 ha is for railway siding, 72.22 ha is for nallah diversion. Mining would be opencast with shovel-dumper combination and surface miner. Grade of coal is G. Capital cost of the project is Rs 1768.14 crores. The total R&R involved is 1341 PAFs belonging to 7 villages – Aamdand (65), Amraikoh (70), Belwar (157), Dongri (113), Jheleri (679), Majholipath (220), Seerswah (37). R&R will be provided as per R&R Policy of M.P. for Singrauli area. Hurudul nallah and Saha nala passing through the project area would be diverted along the boundary of the project. River Gopad flows along the boundary and joins Rihand Reservoir. Two overhead transmission lines (765 KV) of a length of 2.5 km are under construction for supply of power to Silwar from the Sasan Ultra Mega Power Project. Of the 1298 ha of the Suliyari Belwar Coal Block, 807 ha falls in non-forestland and 491 ha is in both forest and non-forest land. The detailed exploration is yet to be completed in forest land. Ultimate working depth is 245m bgl. It was informed that of the total OB of 604.03 Mm³, in which 4.05 Mm³ is topsoil and 599.98 Mm³ is OB, which would be entirely backfilled and the internal dump would rise to a height of 120m above ground level in an area of 551.87 ha. Life of the OC mine is 17 years. During the initial 5 years of operation, 28.33 Mm³ of OB would be stored in a temporary external OB dump over the mineralised area (quarry area) and would be re-handled as the mine advances. Coal evacuation outside the ML area would be by rail. A railway line of 11km length is proposed to be established from Gajara-Behara Railway Station jointly for Dongri Tal-II. A Railway Siding would be constructed. It was clarified that by underground method of the total of 95 MT of extractable reserves only 25 MT would be extracted. At the end of mine life a final void of 409 ha would be left which would be utilised for dumping OB from Ph-II of the project.

The Committee noted that the project is located in an area with extensive drainage of river and nalas, which would be impacted by opencast mining. The Committee also noted that it is not clear whether the project area consists of 1298ha or 1080.99ha and whether forestland is involved. The Committee sought details of overlay of geological sections with external land use details. The Committee also desired that the option of underground or a combination of OC-cum-UG to minimise the impacts should be studied. The Committee also desired that a social cost-benefit analysis vis-à-vis choice of mining methods should be got carried out.

The Committee after discussions decided to further consider the proposal after the aforesaid details are received for further consideration.

4. Letter by e-mail dated 25.05.2012 of M/s North East Coal Washery regarding TOR dated 14.07.2011 and Modification thereto dated 30.09.2011 to 'Proposed Coal Washery (0.12 MTPA in 2.26982 ha area) of M/s North East Coal Washery located in village Kamarkutchi, dist. Kamrup, Assam

The proponent made presentation. It was informed that TOR was granted on 14.07.2011 and modification thereto on 30.09.2011. The proponent informed that the capacity of the washery is to be enhanced from 0.12 MTPA to 0.24 MTPA as it is proposed to increase the working from one shift (8hrs)

to 2 shifts (16 hrs) per day. It was informed that no additional land is required. The water requirement would be enhanced from 85m³/day to 160m³/day and the total manpower is also increased from 54 persons to 85 per day. It was informed that they are presently engaged in trading coal and records of details of coal being obtained could be made available.

The Committee after discussions decided to further consider the proposal upon receipt of the records of purchase details of washed coal. The Committee decided that clarifications should also be obtained from the Govt. of Meghalaya and from Ministry of Coal on the regulations under which coal is produced in Meghalaya as part of TOR for consideration during EC.

5. Letter dated 21.04.2012 of M/s ECL on TOR for Cluster-3 Group of Mines of M/s Eastern Coalfields Ltd., Raniganj Coalfields, dist. Burdwan, West Bengal (TOR)

A revised application for TOR for Cluster No.3 Group of Mines consisting of Dabor UG (0.070MTPA), Bonjemeheri UG and OC (0.10 MTPA), Sangrararh UG & OC (0.080 MTPA), Dalmiya UG (0.12 MTPA) of M/s Eastern Coalfields Ltd., located in Raniganj Coalfields, Asansol, dist. Burdwan, West Bengal for renewal, was considered in the EAC (T&C) meeting held on 21st-22nd February 2012, however, there was a discrepancy in the data furnished by the proponent in the application and in that presented duringt he EAC meetingas a result of which TOR was not issued. The clarifications furnished by the proponent vide letter dated21.04.2012 were further considered.

The proponent made a presentation. It was informed that the cluster consists of 3 mixed mines (UG & OC) rather than 6 separate mines of a combined ML area of 1628 ha and a production capacity of 3.33 MTPA (normative) and 3.97 MTPA (peak). The capacity of Dabor OC has been increased from 1.57 MTPA to 2.30 MTY. It was informed that illegal mining is going on in the seams which have outcropped. In order to extract the coal found in the outcrops, it is proposed to introduce OC mining in the outcropped patches to the depth of 50m. Backfilling of OC voids, thereafter would be started in 2-3 years and after exhaustion of the coal reserves found in these patches, the quarried area would be completely backfilled. The total area mined by OC will be 416 ha. Mineable reserve by OC would be 15.8 MT and OB generated 49.43 Mm³. It is also proposed to extend the existing quarries of Bonjemehari & Sangramgarh mines.

The details of Cluster-3 are given below:

S.N.	Name of Mine	Lease Area (ha)		Normative Prod. (MTPA)		Peak prod. (MTPA)		Mine Life (Years)	
		Revised Appl.	Details presented to the EAC	Revised Appl.	Details presented to the EAC	Revised Appl.	Details presented to the EAC	Revised Appl.	Details presented to the EAC
1.	Dabor UG	1204	1204	0.06	0.06	0.07	0.07	>25	>25
	Dabor Ph. I & II OC mine (347 ha)			1.25	2.0	1.57	2.30	10	10
2.	Bonjemehari UG Mine	163	163	0.07	0.07	0.10	0.07	>25	>25
	Bonjemehari OC (50 ha)			0.35	0.35	0.45	0.45	4	4
3.	Sangramgarh UG	261	261	0.05	0.05	0.08	0.08	>25	>25
4.	Sangramgarh Extn. – OC Mine (25ha)			0.80	0.80	1.0	1.0	4	4
TOTAL		1628	1628	2.58	3.33	3.27	3.97		

DETAILS OF MINES OF CLUSTER-3						
S.N.	Name of Mine	UG/OC	ML area (ha)	Production capacity (MTPA)		Life of the mine (years)
				Normative	Peak	
1.	Dabor UG	UG	1204	0.06	0.07	>25
	Dabor Phase I & II OC Mine (347 ha)	OC		2.0	2.30	10
2.	Bonjemehari UG	UG	163	0.07	0.07	>25
	Bonjemehari OC (44 ha)-New Proposal	OC		0.35	0.45	4
3.	Sangramgarh UG	UG	261	0.05	0.08	>25
	Sangramgarh OC	OC		0.80	1.00	4
TOTAL			1628	3.33	3.97	

DETAIL OF OC MINING PROPOSED IN CLUSTER-3							
S.N.	Name of Mine	Area (ha)	Mineable Reserves	OB generation (Mm3)	Life of the mine (years)	Year of Start of Backfilling	Closure Cost @ Rs 6/- lakh/ha
1.	Dabor Phase I & II OC Mine (347 ha)	347	11.78	35.0	10	3 rd	2082
2.	Bonjemehari OC (44 ha)-New Proposal	44	1.32	4.05	4	2 nd	264
3.	Sangramgarh OC	25	2.70	10.38	4	2 nd	150
TOTAL		416	15.8	49.53			2496

PRODUCTION DURING LAST 5 YEARS (MT)						
S.N.	Name of Mine	2006-07	2007-08	2008-09	2009-10	2010-11
1.	Dabor UG	0.04	0.03	0.03	0.03	0.03
2.	Bonjemehari UG & OC	0.14	0.07	0.03	-	0.03
3.	Sangramgarh UG & OC	0.84	0.53	0.18	-	-
Total		1.02	0.63	0.24	0.03	0.06

The Committee recommended TOR to Cluster-3 group of mines incorporating the aforesaid modification.

- Report of the Sub-Committee's Site Visit to 2 Coalmines in North-Eastern Coalfields of M/s Coal India Ltd., Assam –(i) Lekhapani Opencast Coalmine Project (0.25 MTPA in an ML area of 235 ha) of North Eastern Coalfields of M/s Coal India Ltd., located in dist. Tinsukia, Assam and

(ii) Tikak Extn. OCP (0.2 MTPA in ML area of 192 ha) of North-Eastern Coalfields of M/s Coal India Ltd., district Tinsukia, Assam (Further consideration of EC based on TOR)

The EAC (T&C) in its meeting held on 17th-18th October 2011 had decided that a Sub-Committee would visit the aforesaid mines located in North-Eastern Coalfields, Assam. A Sub-Committee consisting of Prof. C.R.Babu (Vice-Chairman), Shri T.K.Dhar (Member), Dr.R.K.Garg (Advisor, CIL) and Dr.T.Chandini, Director, MOEF visited the coalmines during 4th-6th April 2012. The Sub-Committee was accompanied by the Chief General Manager (Shri A. K. Bora), General Manager (Dr D.Sarkar) and other senior officials of NEC.

The Report of the Sub-Committee is at **Annexure-3** and has the following major observations:

- (i) The low lying hill ranges which bear coal reserves are mostly composed of clayey or clayey silt soils, and harbour biologically rich, 4-5 with abundant epiphytes and climbers. These hill ranges are water sheds for complex network of streams, rivulets and rivers that drain the entire area into larger river system of Bramhaputra. Removals of forest cover from these hills. Any changes to land use for opencast mining could lead to (i) massive landslides and (ii) excess surface runoff resulting in floods in the downstream. For environmental conservation, the coal reserves in these mines are best extracted by underground mining - a method followed during the British rule and still followed by NEC.
- (ii) Opencast mining results in deforestation of biologically richest` tropical rainforest biome in one of the hotspots of the world leading to loss of biodiversity, including some rare, endangered and threatened and endemic biota, particularly orchids and butterflies.
- (iii) Although the climax primary forests have been logged, the secondary forests developed are also biologically rich.
- (iv) Apart from the loss of biodiversity and adverse changes in hydrology, the other major issue of open cast mining is the acid drainage from OBDs and cut surfaces of hills, and mine void acid water leading to acid pollution of streams/rivers and also the soils.

Keeping these vital aspects in view, after careful analysis of the work done by NEC and field observation made, the subgroup recommends the following:

- (i) In general, underground mining should be undertaken in the coal mining areas of North-Eastern Coalfields, which harbour luxuriant tropical rainforest ecosystems.
- (ii) Opencast mining could be permitted in the two aforesaid proposed blocks (as the forest cover in the blocks has already been removed by shifting cultivation) on the following specific conditions:
 - (a) No external OBD should be allowed to remain for long period and should be used to backfill the void in order to avoid problems of Acid Mine Drainage (AMD);
 - (b) The original topographic features such as slope of the hills, valleys and peaks should taken into consideration while re-handling the OBD and for backfilling the mine voids and the Mining Plan should be drawn to ensure that critical biotopes are excluded from mining, wherever possible;
 - (c) Rare, endangered/ threatened and endemic species are introduced into ex-situ conservation areas such as Orchidarium, Butterfly Parks and Arboretums before the mining operation;

- (d) Roads and a well pitched garland drain all around OBDs should be provided for treatments of mine water in tailing ponds/lakes/lime dosing tanks before discharging the treated water into streams;
 - (e) Acidic mine water in mine voids should be treated in a similar manner with lime dosing before final discharge into streams/rivulets; monitoring of the point of discharge and the points of rivers/nalas/receiving surface waters upstream and downstream of the point of discharge should also be monitored regularly for major water quality parameters including pH, TSS, TDS, etc and records of data thereon maintained.
 - (f) Until the OB from external OB dumps are rehandled, the OB dumps should be planted with grasses, bamboos and species as *Macaranga*, *Osbeckia/Melastoma* and ferns such as *Glechinia/Dryopteris*, etc.
- (iii) After backfilling, restoration of the entire mined out area to original forest ecosystem should be initiated using some 140-170 native species from the pre-mining ecosystem, the saplings of which are available in the nurseries of Digboi Forest Division and maintained at Digboi town. Around 140 native tree species as seen by us during our visit are well established at the Arboretum of Digboi town.
- (iv) The following pioneer species should be particularly planted to begin with: (1) *Macaranga*, (2) *Sterculia*, (3) *Duabanga*, (4) *Melastoma/Osbeckia*, (5) *Morus*, (6) *Terminalia myriocarpas*, (7) *Eugenia*, (8) Bamboos and others. After the above species are planted in the first instance, the other native species should subsequently be introduced. Even the other native species could also be introduced simultaneously if the substratum has some top soil. The saplings of 140 – 170 native species, already established at Arboretum of Digboi town, should be procured forthwith from the nurseries of Digboi Forest Division and /or from the forest floor of reserve forests by deploying women folk as a part of CSR activity.
- (v) Exotics such as *Acacia auriculiformis*, *Cassia siamea*, Neem and other exotics should not be planted. It is absolutely meaningless to plant these desert plants in such high rainfall areas where the biologically productive rainforest communities thrive very well.

The Committee, based on the recommendations of the Sub-Committee, recommended Tikak Opencast Coal Mine Project and Lekhapani Opencast Coal Mine Project for environment clearance, subject to forestry clearance for the forestland found in the two projects.

7. Report of the Sub-Committee's Site Visit to Nimbri-Chandawatan Lignite Mine Project (0.2 MTPA in an ML area of 350 ha) of M/s Binani Cements Ltd., district Nagaur, Rajasthan

The EAC (T&C) in its meeting held on 21st-22nd February 2012, after consideration of the reports of the Dr.Sushma Panigrahy, SAC and Dr.V.B.Mathur, WII, had decided that a Sub-Committee comprising of experts – Prof. C.R.Babu and Shri T.K.Dhar and representative, MOEF would visit the project site and also discuss with the proponents and local communities on the impacts of the proposed project on the livelihood and how they can be addressed/minimised. The Report of the Sub-Committee based on its visit to the site on May 2nd 2012 is at **Annexure-4**.

The Sub-Committee informed the EAC that the proposed mining project consists of Phase-I (350 ha) for which EC has been applied for and Phase-II, where exploration is on-going. There are 13 'nadis' or water

bodies in the total project area covering phase-I and II. Although, seasonal, these water bodies are crucial for the 3 crops/year grown in the area making the land fertile and also as a source of drinking water for the livestock in the area. The 'nadis' are also a habitat for a number of bird species. The 'nadis' are also a source for recharge of ground water. It had been stated by the proponent that the mining at its ultimate depth may encounter the confined aquifer and there is also strong possibility that the mining may puncture the saline aquifer. The Sub-committee observed that this would render the area infertile and unsuitable for cultivation after the mining is completed. It was also noted that EC sought for the present proposal is for 13 years only for Ph-I (350 ha) and considering such a short period, it is not desirable for permitting mining in an area, which would permanently destroy Nimbri village (which requires to be resettled) and the watershed of the area, on which agriculture and livestock are dependent upon. The EAC was also informed that there was strong resistance from the local communities of village Nimbri, who are not willing to give their land for the proposed project.

A copy of Report of the Sub-Committee's site visit report was personally handed over to project proponents for their response, if any. The representatives of the company read the report of the sub-committee and sought time to respond to the issues. A copy of the representation received from the local community during the Sub-Committee's site visit has also been separately forwarded to the proponent.

The EAC decided that the proposal would be further considered after receipt of response from the proponent.

8. Bithnok Lignite Mine Project (2.1 MTPA) of M/s Neyveli Lignite Corporation Ltd. proposed to be located at village Bithnok, District Bikaner, Rajasthan (Further consideration of EC based on TOR 13.04.2007)

The proponent made a presentation. The proposal is for opening a new Bithnok Lignite Mine Project (2.1 MTPA) of M/s Neyveli Lignite Corporation Ltd. to be located at Bithnok, District Bikaner, Rajasthan. The proposal was last considered in the EAC (T&C) meeting held on 28th-29th November 2011 and the details/clarifications sought by the EAC were further considered.

The proponent made presentation. It was informed that as per the approved Mining Plan, the proposed sequence of mining requires no re-handling of waste at the time of Final Mine Closure. The selected sequence will ensure superior backfilling of void and also facilitate review of ultimate mine boundaries in the later years of mine operation. During 3rd and 4th year of mine operation, the entire overburden 19.74 Mm³ and 49.74 Mm³ removed and 19.74 Mm³ and 30.0Mm³ will be dumped in the external dump (D1) and from 5th to 15th year the internal dumping would be started in the de-coaled area and part will be dumped in the external dumps (D1 & D2). From the year 16th to the end of mine life, the entire OB removed will be dumped internally in the de-coaled area. There would be one external dump (D1) in an area of 328 ha. However, as desired by the EAC, three options for Final Mine Closure had been examined and the associated constraints were presented in detail; Option-I involves relocating the external OB dump around the final Mine void; Option-II- involves maintaining the dumps as planned in the approved mining plan and transporting the material to the final mine void; and Option-III involves storing overburden in three small Dumps within the mineralised area. It was informed that the cost involved in option-I would be Rs 909 crores, Rs 1232 crores for option-II and Rs 1715 crores for option-III. It was informed that the cost of re-handling of OB and its transportation in all the 3 options as above would be very high, which affect the economic viability of the project. It was further informed that no

land is available along the dip side for storing OB as there is forest land on the south and east of the final pit. The proponent informed that the Final Mine Closure Plan approved in the Mining Plan as per MOC Guidelines for a total cost of Rs 144.12 crores or Rs 6 lakhs/ha of the total project area appeared to be the best strategy; as of the total mine lease area of 1135ha, 863 ha (76%) would be progressively backfilled. Thus, of the total 1086.27 Mm³ of OB generated during the life of the mine, an estimated 904.67 Mm³ (83.3%) would be backfilled and the balance 181.6 Mm³ of final void would be stored externally. The original final depth of 205m is now proposed to be backfilled to reduce the final depth to 105m leaving an open pit of a depth of about 105m as a water body in an area of 101ha, which is only 9% of the total mine area of 1135 ha. The proponent informed that the water in the final void filled would be brackish at the post mining stage. The proponent proposed Solar Thermal Energy Plant for treatment of the saline water in the final mine void as the same has been tried by TERI (and later discontinued) in Bhuj Gujarat, EIPOSO Solar Pond in USA, Pyramid Hill Solar Pond in USA. The Proponent presented details of Solar Power Generation electricity Plant from saline water with the TDS between 4,000- 7,000 mg.

The Committee observed that at the end of mining, a final void of 100m depth would be left in an area of 101 ha filled with saline water. The Committee was of the view that leaving such a large water body at the post mining stage is an environmentally unsustainable option in a desert region. The Committee desired that the proponent rework the options of final mine closure to be presented to the Committee. The Committee requested the proponent to examine backfilling the final mine void upto 57m bgl which would ensure that there is no mixing of rainwater with the saline groundwater. The rainwater stored in the final mine void could be used for consumption and a source of recharge of the water shed. The Committee sought details of extent of lignite reserves found in the forest patch found in the southern part of the ML and it could be left undisturbed as the forest has Khejri trees/plants which are very sparse in the area, in general. The Committee sought photographs of the Khejri forest and also suggested that Khejri plantation be developed in vacant areas of the mine. The Committee desired that cost for decommissioning in the Final Mine Closure should include costs of re-handling, which are not reflected in the Guidelines of the MOC. The Committee suggested that the proponent also examine whether minerals such as shale, sandstone, limestone, clay, etc encountered with OB could be sold to other user to generate revenue before lignite mining to reduce the volume of OB and the space requirement for its storage. The Committee sought details of lithologies of the block along with geological sections.

The Committee desired that the proponent should carry out a Social Cost Benefits Analysis to see whether the costs of destruction of the socio-economic factors and livelihood is more than the returns or profits on the investment made. The Committee suggested that proponent should use UNIDO Method and Little & Mirrlees (1968) analysis technique developed for understanding the economic viability of project. The Committee noted that a Director level officer of M/s NLC should be present henceforth in the EAC meetings for taking decisions on behalf of the company. The Committee after discussions decided to further consider the proposal upon receipt of the aforesaid details.

9. **Hadla Lignite Mine Project (1.62 MTPA normative with a peak capacity of 1.90 MTPA in a total ML area of 1567 ha) of M/s Neyveli Lignite Corp. Ltd. located in Tehsil Kolayar, district Bikaner, Rajasthan (Further consideration of EC based on TOR 12.06.2008)**

The proponent made a presentation. The proposal is for opening a new Hadla Lignite Mine Project 1.62 MTPA normative with a peak capacity of 1.90 MTPA in a total ML area of 1567 ha) of M/s Neyveli Lignite Corporation Ltd. to be located at in Tehsil Kolayar, district Bikaner, Rajasthan The proposal was last considered in the EAC (T&C) meeting held on 3rd-4th January 2012 and the details/clarifications sought by the EAC were further considered.

The Proponent made the presentation. It was informed that based on the TOR, the requirement of land of the ML area was reworked and reduced from 2001.61 ha to 1607 ha and about 400 ha including non-mineralised areas and areas with habitation have been surrendered to minimise the extent of R&R. No forestland is involved. The details of total land requirement of revised ML area of 1607 ha (including an extent of 40 ha for Conveyor corridor & approach road) was presented as given below:

Table: Break-up of ML area (original and revised) in ha

S.N.	Particulars	Originally proposed during TOR stage	Break up as per mining operations
1	Quarry area	752	621
2	External dump	519	306
3	Geological block area currently not considered for mining	630.6	439
4	Infrastructure (Office, Workshop, LHP etc)		15
5	Service area for Outsourcing agency including Temporary colony		75
6	Intervening area, Green belt etc		111
7	Approach Road, Conveyor corridor		40
	Total area	1901.6	1607

Table: Landuse (in ha) break up for Mining Operations

S.N	Particulars	Originally proposed during TOR stage	Break up as per mining operations
1	Forest land	0	0
2	Irrigated land	59.62	59.62
3	Non-irrigated land	1936.19	1541.58
4	Water bodies	0	0
5	Grazing land	0	0
6	Area not available for cultivation (Govt land)	5.80	5.80
	Total	2001.61	1607.00

It was informed that the normal annual rainfall in the area is 232mm. The long-term data on groundwater level of the Zone has revealed a declining trend of about 1.6m per year. It was informed

that the total open scrub area within the ML is 397 ha. Also, areas with reserves, which are presently uneconomical for mining, would be left undisturbed. It was informed that plantation/green belt would be developed in 29 ha during the first three years from the date of commencement of project. It was informed that out of total ML area, an area of 621 ha is for quarrying, of which 504 ha (81%) would be backfilled. The total volume of OB to be generated is estimated to be 585.67 Mm³, of which 508.12 Mm³ (87%) would be backfilled leaving about 77.54 Mm³ of final void. The cost of Final Mine Closure is estimated to be Rs 9404 lakhs. It was informed that that the final void depth of 130m, would be backfilled upto 65m and the top 65m would be left as a void of an area of 51ha, which is 8% of the total quarry area of 621 ha. The proponent presented project specific plan for mitigation of air pollution due to mine operation eg. maintenance of haul roads, control of fugitive dust emissions on haul roads, provision of water sprinkling system at Lignite Handling Plant, fog cannons at transfer points, reclamation of OB dumps, provision of mobile sprinklers, and plantation along roads, around infrastructure etc. It was informed that the total requirement of water has been reduced from 1901 m³/d to 1539 m³/d (95 m³/d for fire control has been deleted and requirement for colony has been reduced from 942 m³/d to 675 m³/d). Details of hydrogeology of the area were presented. It was informed that the Hadla area lies in groundwater potential zone (T1 – NC) and covers an area of 975 Sq Km and is located in eastern and central part of Kolayat Block. The groundwater level in the area ranges between 115-120m below ground level. The groundwater occurs below unconfined to semi-confined conditions. Two observation wells in the Hadla Mine area have been established, which indicates a declining trend. The water in the wells was observed at a depth of 120m to 130m below ground level. It was informed that mining would reach a depth of about 120m only in the 15th year and in view of the continued decline in ground water level, it is unlikely that mining would intersect the aquifers. It was informed that the estimated manpower of 90 persons required for the project would be accommodated in the colony of the existing Barsingsar colony. Hadla Project would require provision of infrastructure such as service yard, parking, storage area, washing bay. An Action Plan for the implementation of Resettlement and Rehabilitation of 209 Project affected families (PAFs) as well as the CSR has been prepared.

The Committee desired that thick green belt should be developed along vacant areas using local species. The Committee after discussions suggested that minerals such shale, sandstone, limestone, clay, etc found with the OB could be sold first to other users to generate revenue and before lignite mining which would reduce the total volume of OB and space requirement. The Committee recommended that the proponent should prepare a study on the potential impact of mining on the groundwater the hydro-geological report 10 years after start of mining, **well in advance before likely intersection of groundwater**, i.e, well before reaching the ultimate working depth of 120m bgl and the report on the same furnished to the ministry. The Committee desired that the total water requirement for the project should be minimised and the wastewater should be recycled from the ETP and STP and used for dust suppression and developing green belt. The Committee recommended the project for environmental clearance.

10. **Letter dated 04.06.2012 from M/s Bharat Aluminium Company Ltd. (BALCO) seeking Corrigendum to EC granted on 24.05.2012 to Durgapur-II Taraimar Opencast (3 MTPA) - cum- Underground (1 MTPA) Coalmine Project (combined OC-cum-UG = 4 MTPA) and Captive Coal Washery (4 MTPA) in an ML area of 1070 ha.**

The proponent made presentation before the committee and informed that the above cited project was granted an environmental clearance on 24th May 2012 and sought a corrigendum in the EC condition (xxiii) reproduced below:

(xxiii) *The entire quantity of clean coal and middling shall be transported by MGR only to the linked TPP at a distance of 71 km from the mine. MGR route shall be aligned to ensure minimal disturbance to movement of wild fauna in the area. A time limit of 5 years for the establishment of MGR for coal transportation shall be given. Until the operation of the MGR for initial 5 years, coal transportation could be by road to railway siding at Kharsia which is 60 km from mine and thereafter to Korba. The proponent shall in consultation with PCCF (WL), Govt. of Chhattisgarh introduce alert/warning system such as whistle, horn, etc and train their drivers of MGRs for reducing train speeds to enable the wild animals including wild elephants to move away from the MRG tracks."*

The proponent informed that the transportation of 12000 TPD of coal from mine to power plant would be by MGR only and until its establishment, coal transportation would be by SH-4 road from Dharamjaigarh to Korba involving 400 Trucks per day and not to railway siding at Kharsia which is 60 km from mine and thereafter to Korba as stated in the EC condition. It was further informed that the 400 trucks (one way) from mine to the linked plant would be plying at peak capacity i.e. only during 3rd-4th year of mine operation. It was explained that the distance from mine to Kharsia railway siding is about 60 km and from Kharsia siding to Power Plant is 83 km, and thus, the total distance for road-cum-rail option is 143 km as against 100km for road directly from the mine to power plant. It was further informed that SH-4 (from Dharamjaigarh to Korba) can easily absorb the additional truck movements until MGR is commissioned.

The Committee desired that the human population along the SH-4 should be protected from dust pollution by development of 3-4 tier avenue plantation, in consultation with State Forest Department, on both sides of the road along stretches near villages/habitations and its regular maintenance on a participatory approach along with other companies, if any, using the SH-4. The Committee further desired that transportation of coal by road should be by using mechanically covered trucks to reduce the dust pollution and spillage on road. The Committee recommended modification of the Specific Condition No (xxiii) incorporating the aforesaid changes.

11. Jampali OC Project (2 MTPA normative and 3 MTPA peak in an ML area of 635.60 ha and 22.50 ha outside the ML) of M/s South Eastern Coalfields Ltd. located in villages Jampalli and Singhmouza Tehsil Gharghora, Dist. Raigarh, Chhattisgarh - Further consideration of EC

The proposal was last considered in the EAC (T&C) meeting held on 29th-30th August 2011 and the Committee after discussions had recommended the project for environmental clearance. The Ministry had desired that the representations received by the Ministry from Shri Raghuvir Pradhan of Ekta Parishad and from Shri Ramesh Agarwal of Jan Chetana during the Public Hearing of Jampali OCP should be placed before the Committee for consideration. The proponent made a presentation before the Committee.

The Committee observed that the response was vague. The Committee sought a point-wise reply in tabular forms in 3 columns on the various issues raised in the two representations. The Committee noted that the Conservation Plan should be more detailed. The Committee desired that the proponent

seek legal opinion on the issue of land acquisition for Jampali OCP and other such mines in the area, for which an Order been passed by the Hon'ble High Court of Chhattisgarh has been referred to in the representation of Jan Chetna.

The Committee after discussions decided to further consider the project after receipt of the aforesaid details.

The meeting ended with a vote of thanks to the Chair.

* * *

PARTICIPANTS IN 50th EXPERT APPRAISAL COMMITTEE (THERMAL & COAL MINING) IN THE MEETING HELD ON 18th-19th JUNE 2012 ON COAL SECTOR PROJECTS

1.	Shri V.P. Raja	...	...	...	...	Chairman
2.	Prof. C.R. Babu	...	...	...	...	Vice-Chairman
3.	Shri T.K. Dhar	...	...	.....	...	Member
4.	Dr.G.S.Roonwal	...	...	....	...	Member
5.	Dr. Shiv Attri (1 st day)	...	...	...	...	Member
6.	Dr. T. Chandini	...	...	...	...	Scientist F MOEF
7.	Dr.Rubab Jaffer	...	....	...	....	Scientist B MOEF

PARTICIPANTS IN 50th EXPERT APPRAISAL COMMITTEE (THERMAL & COAL MINING) IN THE MEETING HELD ON 18th-19th JUNE 2012 ON COAL SECTOR PROJECTS

1. M/s DB Power Limited

1. Shri R K Gupta CEO, DB Power
2. Shri Deep Kamra, Sr. VP (Coal), DB Power
3. Shri Vaishav Alshi, DB Power
4. Shri R K Jain, Advisor, DB Power
5. Shri Girish Agarwal, DB Power
6. Shri A K Rai, DB Power
7. Shri Sanjay Ganjoo, DB Power
8. Shri Kapil Gohel
9. Shri Pankaj Bharadwaj,
10. Shri B D Sharma, MINMEC
11. Dr.Marisha Sharma, MINMEC

2. M/s Radhikapur (West) Coal Mining Pvt. Ltd.

1. Shri D K Jain, Radhikapur (West)
2. Shri Dayal Chand, RML
3. Shri G.P. Sharma, RML
4. Shri B D Sharma, MINMEC
5. Dr. Marisha Sharma, MINMEC

3. M/s A.P.Mineral Dev. Corp. Ltd.

1. Shri H D Nagaraja, Executive Director, A P MDC
2. Shri Y Rajeshwar Reddy, COP (Coal), APMDC
3. Shri D Ravi Prasad, Dy GM, SCCL
4. Shri P Sharath Kumar, Addl. Mgr & Consultant
5. Dr. Durga Vara Prasad, RO, SCCL

4. M/s North East Coal Washery

1. Dr.D. Bishan Kamlal
2. P M Pareek, North East Coal Washery
3. Meuing Singh, North East Coal Washery

5. M/s Eastern Coalfields Ltd.

1. Shri J N Biswal, ECL
2. Shri G Prasad, Reg. Director, CMPDI
3. Shri A Shekar, Mgr. (E&M), CMPDI

6. M/s Binani Cements Ltd.

1. Rh Tenka, GM, Binani Cements
2. Ms. Mudita Tomar Singh, Manager (Env.)
3. Shri Robin Bose, DGM

7. M/s Neyveli Lignite Corporation Ltd.

1. Shri C Muthusamy, Addl. GM, NLC
2. Shri Susai Arulraj, GM
3. Shri M Raghunathan, DGM, NLC

4. Shri Bhupindrajit Singh, KIKONS
4. Shri Mahesh Bilaskar, KIKONS

8. M/s Bharat Aluminium Company Ltd.

1. Shri B K Bhatia, AVP, BALCO
2. Shri R K Narang, AGM, BALCO
3. Shri P Giri, Creative Engineers

9. M/s South Eastern Coalfields Ltd.

1. Shri S Singh, SECL
 2. Shri T P Keshri, SECL
 3. Shri A K Gupta, SECL
-

ANNEXURE-3

**REPORT OF THE SUBGROUP NOMINATED BY
THE EAC (COAL MINING) ON VISIT TO THE TWO
OPERATING AND TWO PROPOSED COAL
MINES OF NORTH EASTERN COAL FIELDS
(NEC) OF M/S COAL INDIA LIMITED LOCATED IN
DIGBOI FOREST DIVISION OF TINSUKIA
DISTRICT OF ASSAM**

**Ministry of Environment and Forests
Government of India
New Delhi**

May' 2012

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Report on the visit to the two operating and two proposed Coal mines of North Eastern Coal Fields (NEC) of M/s Coal India Limited located in Digboi Forest Division of Tinsukia District of Assam

1.0 Background

The North Eastern Coal Field (NEC) has a lease hold area of 26.88 sq. km in the luxuriant tropical rainforests of Digboi Forest Division, a bulk of the Division has already been converted into Tea Gardens. Most of the forests are confined to hilly terrain. The Makum Coalfields are confined to these hilly landscapes which harbour at present secondary forests. The primary climax forests dominated by giant *Dipterocarpus macrocarpus* were already logged for plywood and for other woods (*Shorea assamica*, *Terminalia myriocarpa* and *Mesua ferrae*) of industrial value. These were 4-5 storeyed forests with abundant orchids, ferns, lianas and climbers. The NEC with its headquarters at Margherita is at present extracting coal from the following 6 mines:

(i) Baragolai underground mine, (ii) Tipong underground mine, (iii) Ledo underground mine, (iv) Tirap open cast mine, (v) Tikak open cast mine, and (vi) Ledo open cast mine. These coal mines cover 2688.16 hectares.

The North Eastern Coalfield has applied for EC for Tikak extension OCP (0.2 MTPA from 192 ha of ML area) Lekhapani OCP (0.25 MTPA from ML area of 235 ha). The EIAs based on TORs of both the projects were considered by EAC (T&C) in meetings held on 22-23, March 2010 and again on 17-18, October 2011 (Lekhapani case) and on 26-27 October 2010 and 17-18 October 2011 (Tikak Extension OCP). Since both the projects are located in biodiversity rich tropical rainforests of upper Assam and since the area is known to be corridor for elephants (in fact Lekhapani Reserve forest including the proposed site of forest diversion also falls in Dehing - Patkai Elephant Reserve). Further, the mine water is acidic due to pyrite, and the run off from OBDs which contain shales is also acidic; this acid mine drainage contaminates ground water, surface water including rivers, and soils. An NGO (Purbanchal Welfare Organization, dated 10th October 2009) also represented the Ministry on the adverse impacts of mining in the Makum Coalfields on the ground water, rainfall, forests etc.

It was decided by the Committee that a subgroup consisting of Professor C.R. Babu, Shri T.K. Dhar, Dr. R.K.Garg, Advisor, CIL and Director, MoEF may visit the sites of both the projects and submit the site specific environmental measures to mitigate the likely adverse impacts of mining.

2.0 Site Visit

Shri T.K. Dhar, Dr T. Chandini, Dr R.K. Garg (Adviser in CIL) and Professor C.R. Babu visited the sites from 4-6th April 2012. The subgroup accompanied by the Chief General Manager (Shri A. K. Bora), General Manager (Dr D. Sarkar) and

other senior officials visited: (a) Nursery, (b) Butterfly Park, (c) Orchidarium, (d) reclaimed OBDs, (e) backfilled voids, (f) voids of existing Tikak OCP and (g) proposed Tikak extension OCP, (h) Tipong OCP, and (i) Museum (j) Ledo valley recreation centre (reclaimed abandoned mine), (k) Ledo OCP and lime dosing plant for treatment of acid mine water, (l) proposed Lekhapani OPC, (m) Tipong underground mine where heritage steam loco engine is still in use for coal transportation, (n) Arboretum of Digboi Forest Division at Digboi Town and also (o) Dibru-Saikhowa National Park. A presentation was also made by the officials to the subgroup. At Arboretum the subgroup interacted with DFO of Digboi Division and discussed about the feasibility of providing saplings of native forest species for restoration of OBDs of NEC.

The subgroup also interacted with members/representatives of village Committees/Gram Panchayats/Gram Sabhas of villages located in and around Tikak extension OCP and Lekhapani OCP (Annexure I).

The officials present during visits to different places and at the time of presentation and discussion with local representatives are annexed (Annexure I).

3.0 General Landscape features of the mine lease area of NEC

These coal mines are located on the south-eastern side of Burchi - Dihing River, northwest of which has dense forests of Margherita east range and further west was Digboi range; there is an elephant corridor between Digboi range and Margherita east range (Figure 1). The coal mines are located in Lekhapani range which is situated on the south east of Burchi - Dihing River (Figure 1). The Margherita east range is located on the south west of Burchi - Dihing River. All the mines listed fall under Tipong, Lekhapani and Tikak forest ranges (Figure 2). A network of streams, rivulets and rivers originate from the hilly terrains of these reserve forests. In other words these three reserve forests are watersheds and catchments. Some of the rivulets and rivers that pass through coal fields are: Namdang river (flowing besides Tikak OCP and Baragolai colliery), Ledo paninallah flowing besides Ledo OCP, Tikak river flowing besides Lekhapani OCP and Tipong river flowing Tipong valley (Figure 2).

These hill ranges used to harbour luxuriant 4-5 storeyed tropical rainforest biome with top layer occupied by lofty *Diptocarpus macrocarpus*, *Shorea assamia*, *Altingia excelsa*. The second storey is dominated by *Mesua ferrae*, *Dysoxylum*, *Terminalia*, *Litsea*, *Elaeocarpus* and *Vatica*. The third storey is represented by *Dillenia*, *Mesua indica*, *Ardisia*, tree ferns (Figure 3) and *Calamus* species. The fourth storey is represented by herbs such as *Musa* (Figure 4) and *Dryopteris/Gleichenia*. Epiphytic orchids and ferns are abundant and climbers and lianas are plentiful.

4.0 Observations

- 4.1 Nursery:** A central nursery, with a capacity to grow one lac saplings, spreading over an area of more than one hectare is established besides Dehing Training Institute (Figure 5). There are polyhouses and net houses with several thousands of saplings of mostly exotic species and a few species of fruit yielding plants such as mango, citrus, *Artocarpus*, *Psidium guajava* and *Eugenia*. The subgroup suggested to the authorities that native forest tree species saplings like *Artocarpus* species, *Eugenia*, *Dubanga*, *Canarium*, *Dillenia*, *Sterculia*, *Macaranga*, Bamboos, *Morus*, *Terminalia myriocarpas*, *Alstonia*, *Aesculus*, *Dipterocarpus macrocarpus*, *Shorea assamia* should be raised.
- 4.2 Butterfly Park and Orchidarium:** The Butterfly Park located above the hills of Tikak Colliery besides the haul road leading to existing Tikak OCP has small Interpretation Centre (Figure 6). The restored OBD is mostly composed of *Acacia auriculiformis* and *Cassia siamea*. The ground is barren. A few ornamental plants were observed. A few common butterflies that visit ornamentals were also noted. The interpretation centre (Museum) has good and varied collection of butterflies. In the Orchidarium (Figure 7) some epiphytic orchids are grown on trunks and branches of *Acacia auriculiformis*; some are grown on hanging twigs covered with mosses. in pots filled with wood charcoal and gravel; a few terrestrial orchids are grown in soil and pots filled with soil. Some of the orchids are exotic. Native orchids are poorly represented. These newly created conservatories were located on a reclaimed OBD above the hills of Tikak colliery besides the haul road leading to existing Tikak OCP

A recreational children park was also developed in the township of Margherita on the way to mines. The subgroup visited Rajiv Gandhi Stadium at Baragolai beside NH 38 to the North where few coke own plants generating black fumes are perhaps responsible for acidification of soils and waters due to use of sulphur rich coal.

4.3 Abandoned/Closed Mine at Ledo

Ledo Valley Recreation Centre (Figure 8) is located close to NH-38 and is on the western side of Ledo OCP. A stadium called Pataki Stadium, a park and a lake (Figure 8) have been created on an abandoned mine. A part of the void is backfilled and developed into a flat cricket ground and a part is left as a shallow water body. External OBDs without reclamation were also observed. The flat cricket ground of the backfilled void was covered with grasses such *Paspalum* (turf grass) and *Cyanodon*. The reclaimed OBDs mostly harbour stands of *Acacia auriculiformis* and *Cassia siamea* (Figure 8). The flat area near the void, where VIPs planted trees, harbour fruit yielding species such as *Citrus*, and *Eugenia* and mango. The void is shallow and the water is clean and supports aquatic vegetation suggesting its nonacidic nature. Fish is also found in the void.

The non coal bearing areas harbour degraded communities consisting of weeds such as *Chromolaena*, *Mikania* and also a few pioneer species such as *Eugenia*, *Macaranga*, *Osbeckia/Melastoma* and *Sterculia*.

4.4 Tikak OCP (existing):

The OCP is still active and represents mining of a hill of about 300 to 400 m high above the ground level (Figure 9). It was dug upto 30m - 40m depth below the flat ground. Massive cut slopes of the hill with the strata exposed were noted; OBDs were scattered on non coal bearing deforested areas. One reclaimed OBD harbouring *Acacia auriculiformis* and *Cassia siamea* was located on the eastern side of existing OCP. The entire OBD is composed of clayey soil mixed with shales. The void did not have mine water but it receives rain water drained from the slopes. There are streams originating from the hills. The Coal Authorities confirmed that the entire OBD will be used for backfilling after 3 to 4 years. Some external OBDs would still exist.

The hill ranges have specific topography and support a luxuriant 4 to 5 storeyed tropical rainforest, but the topography of back filled areas is mostly flat. These flat back filled areas may not support the dense luxuriant forests which used to exist on the gentle slopes and valleys. The backfilling of voids should be carried out in such a manner that the original topography is restored so that the native forest communities can once again be easily established. The surface drainage from OBDs and mine void is acidic and the surface run off enters in streams/rivulets/rivers.

During our inspection, we found that most of the reclaimed OBD has only weeds such as *Mikania* and native weedy fern *Dryopteris/Glechnia*. Plantation of *Acacia auriculiformis* and *Cassia siamea* are common on OBDs.

4.5 Tikak Extension OCP

The proposed Tikak Extension OCP is located on the north east of existing OCP. These hill ranges have the secondary tropical rain forests having the same floristic composition as mentioned above and described in the Wildlife Conservation Plan in and around coalfields of North East Coalfield by Aaranyak. These forests support rich wildlife, including primates such as Gibbon and many Schedule I and II mammals, butterflies and threatened orchids.

4.6 Lekhapani OCP

This is a catchment area for Tipong and Lekhapani rivers originating from in and around mine lease area of the proposed Lekhapani OCP. The area harbours secondary tropical rainforest (Figure 11) with the same composition as that of Tikak OCPs. The proposed Tipong West and East OCPs are located on the north eastwards of Lekhapani OCP. The OBDs of the proposed Lekhapani OCP and future expansion of Tipong occupy significant proportion of forest area. It is likely that these OCPs may also have acidic mine water. It is felt that the quantum of acidic water in all these OCPs will be enormous and accordingly the amount of lime required for dosing will also be enormous. We would strongly advise that the management of OBDs should be such that void after decoaling should immediately be backfilled so that the acid water, by and large, is contained and there will practically be no acid surface runoff from OBDs. The mining of the blocks should be sequential in a way that OBDs of one OCP is completely used for filling the decoaled void of another mine.

The OBD should be temporarily covered with grasses and bamboos, and after back filling, the entire area should be restored to original tropical rainforest ecosystem using sapling of same 140-170 species available in the nursery of DFO, Digboi Forest Division.

5.0 Acid Drainage from mines and its management

A Mine Drainage Plan of the Mines of Makum Coalfields should be prepared for ensuring that the mine water from the mines is treated in a ETP to a prescribed standard before discharged into water courses. The issues relating to acid drainage from mines are: (i) acid drainage from cut surfaces, (ii) acid mine void water, and (iii) the acid surface run off from OBDs. These issues can be addressed in the following way:

- (i) Treatment of acid drain in mine pit: It should be pumped into Lime treatment plant and allow the treated water to settle before discharging into streams. Acid mine void water should also be treated in the same way as that of acid mine drain in the pit. The pH and chemical composition should be regularly monitored at the point of discharge. The stream water should also be monitored. Records pertaining to the above should be made and put up to inspecting Authorities.

The ETP with lime dosing should be of a capacity to ensure sufficient retention time for treatment of the acidic mine pit water.

- (ii) There should be a garland drain with sides well pitched with stones around OBDs which should necessarily be channelized into a tailing pond and then pumped into Lime treatment plant.

The treatment plant installed at present has a small capacity (Figure 10) and the capacity of the plant should be enhanced. The residue of tailing pond and lime after treatment should be disposed off safely.

The OBDs and cut surfaces should be sufficiently grassed to prevent leaching and sliding. This would prevent acid drainage to a large extent, but we wish to mention that the lime treatment is not a solution to handle large volumes of acid drain in the long run.

The OBDs, as far as possible, should be restored to original rainforest communities.

The species that can thrive on OBDs are: (i) *Duabanga*, (ii) *Macaranga*, (iii) *Dillenia*, (iv) *Melastomia*, (v) *Eugenia*, (vi) *Litsea*, and (vii) *Kydia*, (viii) *Gmelina*, (ix) *Terminalia myriocarpa* and others.

Saplings of about 140-170 native tree species are available in the nurseries of Digboi Forest Division located at Digboi town. As a part of CSR activities, local ladies and men could be deployed for planting these native species with the assistance of DFO, Digboi Forest Division.

6.0 Recreational Parks and Museum

The NEC established a Recreational Park and a Museum at Margherita. The Recreational Park has a manicured lawn, a fountain and beds of seasonal ornamental plants and few ornamental shrubs. Although the park is well maintained, it does not have native fruit yielding plants and endemic plants of the area.

The Museum depicts the Colonial Heritage of the area and developmental activities in the area, including history of coal mining in the area and World War II activities in the area (Figure 12). The methods of mining are depicted very well by models. All the exhibits are self explanatory and are well maintained. In short the Museum has an immense educative value and preserves heritage of the past. It has, indeed, been a laudable effort on the part of Sh A.K.Bora and his team to have thought of this nice initiative.

7.0 Issues discussed during presentation by officials of NEC

During presentation by the officials of NEC, the following suggestions have been made by the members of subgroup on the proposed Tikak extension OCP and Lekhapani OCP.

Parallel action should be taken up for FC and EC of the projects. Differential GPS should be used for plotting boundary coordinates of the proposed projects. Recommendations of the State and National Wildlife Boards are required for FC.

Spatial data at intervals of every 3 years on the reclamation of mined out areas in NEC should be generated by remote sensing. The water quality of streams in the area should be properly assessed. The environmental quality in NEC should be monitored regularly and at times authenticated by a third party. Yearly Social audit of CSR activities undertaken by NEC should be got carried out through a nearby reputed Institute or University. Monitoring of status in aquatic biodiversity of streams should be carried out regularly and records maintained and furnished to Authorities of Pollution Control / MoEF.

8.0 Discussion with representatives of Gram Panchayat/Gram Sabhas of Lekhapani, Tpong, Gaon Bura, Malu Goan, Phin Hiro, Nepali Gaon, Mulang-3 no. villages

The representatives expressed an immense satisfaction with the social benefits provided by NEC under different programmes, including CSR, and welcomed both the projects. During their interaction they informed the subgroup that the broad requirements of villagers were: (i) employment in mining of the proposed projects, (ii) road connectivity, (iii) drinking water supply, (iv) electricity, etc.

The Sub Committee recommends that since the villages are located in isolated areas and it is difficult to access piped drinking water supply, the local authorities could install pipes onto natural springs to supply piped water from the springs to habitations.

The subgroup had a chance to witness a cultural programme wherein young school going girls and boys displayed their local artistic talents representing a wide range of rich traditional cultures prevalent in the area (Figure 13). The subgroup had a word of appreciation for the same and suggested that NEC should establish a **Centre for promoting traditional cultures** of the region as a part of CSR activity.

9.0 Recommendations

The low lying hill ranges which bear coal reserves are mostly composed of clayey or clayey silt soils, and harbour biologically rich 4-5 storeyed evergreen tropical rainforests with *Dipterocarpus macrocarpus* in the top canopy and with abundant epiphytes and climbers. These hill ranges are water sheds for complex network of streams, rivulets and rivers that drain the entire area into larger river system of Brahmaputra. Removal of forest cover from these hills results in: (i) massive landslides and (ii) excess surface runoff resulting in floods in the downstream. As a matter of fact, the coal reserves in these mines should be extracted by underground mining- a method followed during British Rule and still followed by NEC.

Open cast mining, as is well known, results in deforestation of biologically richest tropical rainforest biome in one of the hotspots of the world leading to loss of

biodiversity, including some rare, endangered and threatened and endemic biota, particularly orchids and butterflies.

Although the climax primary forests were logged, the secondary forests developed are also biologically rich.

Apart from the loss of biodiversity and adverse changes in hydrology, the other major issue of open cast mining is the acid drainage from OBDs and cut surfaces of hills, and mine void acid water leading to acid pollution of streams/rivers and also the soils. Keeping these vital aspects in view, after careful analysis of the work done by NEC and field observation made, the subgroup recommends the following:

9.1 At the outset, the subgroup strongly recommends underground mining in the areas that harbour luxuriant tropical rainforest ecosystems. If it is not possible, then open cast mining only in the presently proposed blocks (as the forest cover in the blocks has already been removed by shifting cultivation) can be permitted on the following specific conditions:

(a) that no external OBD is allowed to remain for longer period and is used to backfill the void in order to avoid acid drainage;

(b) the original topographic features such as slope, valley and peak is taken into account while rehandling OBD and back filling void or the mining plan is drawn in a way that critical biotopes if and where possible are excluded from mining;

(c) live collection of all the rare, endangered and threatened and endemic species are introduced into ex situ conservation areas such as Orchidarium, Butterfly Park and Arboretum before the mining operation;

(d) roads and a well pitched garland drain all around OBDs are provided in a manner that the contents are discharged into tailing ponds/lakes/lime dosing tanks before finally discharging the treated water into streams;

(e) acid mine water in mine voids are treated in a similar manner with lime before final discharge into streams/rivulets;

(f) till the OBDs are rehandled, the OBDs are planted with grasses, bamboos and such pioneer species as *Macaranga*, *Osbeckia/Melastoma* and such ferns as *Glechinia/Dryopteris* and others.

9.2 Immediately after back filling, the entire mined area should be restored to original forest ecosystem using some 140-170 native species, the saplings of which are available in the nurseries of Digboi Forest Division and maintained at Digboi town. Around 140 native tree species as seen by us during our visit are well established at the Arboretum of Digboi town.

The following pioneer species should be planted to begin with:

- (i) *Macaranga*, (ii) *Sterculia*, (iii) *Duabanga*, (iv) *Melastoma/Osbeckia*, (v) *Morus*, (vi) *Terminalia myriocarpas*, (vii) *Eugenia*, (viii) Bamboos and others.

After the above species are planted in the first instance, the other native species should subsequently be introduced. Even the other native species could also be introduced simultaneously if the substratum has some top soil. The saplings of 140 – 170 native species, already established at Arboretum of Digboi town, should be procured forthwith from the nurseries of Digboi Forest Division and / or from the forest floor of reserve forests by deploying women folk as a part of CSR activity.

- 9.3** Exotics such as *Acacia auriculiformis*, *Cassia siamea*, Neem and other exotics should not be planted. It is absolutely meaningless to plant these desert plants in such high rainfall areas where the biologically productive rainforest communities thrive very well.
- 9.4** It is advisable that the exotics planted in Orchidarium and Butterfly Park are replaced by native species procured from nurseries of Digboi Forest Division and the butterflies and orchids of the area are conserved in the Orchidarium and Butterfly Park, before mining is initiated. It may perhaps be worthwhile to consider setting up of an alternative Orchidarium and Butterfly Park before mining is initiated. It may be worthwhile to consider setting up of an alternative Orchidarium and Butterfly Park.
- 9.5** An Arboretum of native tree species should be established on the pattern of Arboretum developed by Digboi Forest Division. The NEC may wish to contact Mr P. Shiva Kumar, DFO – Digboi Forest Division for his advice and necessary help. During our interaction with him, we felt that he has a passion to undertake such challenges where many others fear to tread.
- 9.6** The nursery should maintain the saplings of native forest species and fruit yielding species. The saplings of native species can be obtained from the reserve/protected forest and or from nursery of Digboi Forest Division. The saplings of fruit yielding species such as *Artocarpus*, *Citrus*, *Eugenia*, and local native species should be developed and should also be distributed among local communities.

The 1000s of saplings of exotic species present in the nursery as of now should be abandoned and saplings of native species should be raised. The seeds of exotic species already collected should be abandoned and seeds of native species should be collected and used for raising of saplings.

- 9.7** The existing lime treatment plant is not adequate enough to treat acid drain water and it is certainly not a viable option for the voluminous acid drain originating from all the OCPs keeping in view the enormous amount of lime required to treat acid drain water and the problem of disposal of waste residues from settling tanks.

The environmentally sound option is that the mining should be carried out in a manner that there is no external OBD except for the material taken out for mine opening and OBD is used for backfilling in parallel with mining. If this is not entirely possible or feasible, the external OBD in that case should be grassed and planted with bamboos and used for back filling as soon as the void is ready to receive it.

- 9.8** The subgroup appreciates Sh A.K.Bora, the Chief General Manager and his team for the efforts made to establish Recreation Park, Museum, Butterfly Park and Orchidarium.

The subgroup recommends that NECL to set up a **Centre for promoting and conservation of tribal art and culture** as a part of CSR activity.

- 9.9** NEC should also establish a conservation unit with an ecologist, wildlife biologist and hydrologist to manage Orchidarium, Butterfly Park and to restore mined out areas using native species and to monitor quality of underground water, water of streams/rivulets/rivers and also rain water and periodically through a third party for proper authentication.
- 9.10** NEC should go whole log to develop road connectivity in villages as also provide drinking water facilities as desired by local village communities besides providing them with employment opportunities and skill upgradation facilities by providing good training and retraining, if necessary, to earn their livelihoods.
- 9.11** The NEC should spend as a one time activity a sum of 0.4% of the Capital Cost of the Projects towards CSR activities and afterwards spend Rs. 5/- per metric ton of production when projects are in production stage towards CSR every year.
- 9.12** NEC should undertake quality of precipitation that falls near coke own plants and chemical properties of soils sampled from sites located close and also from coke oven plants in and around mines.
- 9.13** Since the Elephant Reserve includes a part of Lekhapani reserve forest, the Lekhapani OCP would require clearance from the National Wildlife Board.

- 9.14** The subgroup recommends that EC be given to Tikak Extension OCP and Lekhapani OCP with the stipulation of all conditions listed under recommendations.

Acknowledgement

The subgroup of EAC (T&C) extends thanks to the authorities of NEC for providing logistic support during their visit to the sites of NEC from 4th to 6th April' 2012.

Sd/-

(T. K. Dhar)
Member Subgroup

Sd/-

(T. Chandini)
Director MoEF

Sd/-

(R. K. Garg)
Member Subgroup

Sd/-

(C. R. Babu)
Chairman Subgroup

ANNEXURE I**List of officials of NEC and representatives of Village Panchayat and Gram Sabhas and Village Committees present during discussion****(I) Officials of NEC present during presentation at Dehing Guest House**

1. Mr. A.K. Bora, Chief General Manager, NEC
2. Dr. D. Sarkar, General Manager, NEC
3. Mr. S.P. Dutta, Agent, Tipong Colliery
4. Mr. S.S. Gaggar, Agent, Tikak Colliery
5. Mr. S. Bhattacharjee, Staff Officer (Mining)
6. Mr. Malay Das, Sr.Manager (Mining & Environment)
7. Mr. B.B. Das, Dy.GM (E&M)
8. Mr. P.K. Chakraborty, Area Survey Officer
9. Sri R Dutta, Chief Manager (Personnel)
10. Sri R. Thanouja, Manager, Baragolai
11. Sri P. Thangaval, Sr.Manager (Materials)
12. Sri P.N. Rajan, Chief Manager (E&T)
13. Sri T.D. Paul, Sr.Manager (Finance)
14. Sri S. Mukherjee, Area Safety Officer
15. Sri R. Mech, Manager, Tikak Colliery
16. Sri J. Das, Manager, Tirap Colliery
17. Sri Indranil Roy, Manager, Tipong Colliery
18. Sri K. Deepa Kumar, Area Sales Manager
19. Dr. R. Patnaik, Chief of Medical Services
20. Sri K.P. Sharma, Manager, Ledo OCP
21. Sri A. Nath, Sr.Manager (Civil), Tikak Colliery
22. Sri D.N. Choudhury, Sr.Manager (Civil), Tirap Colliery
23. Shri T. Das, Manager (Survey), Tipong Colliery.

(II) List of officials and representatives of different Village Panchayats/Gram Sabhas and Village Committee present during the meeting

1. Shri A. K. Bora. Chief General Manager. NEC.
2. Dr. D. Sarkar. General Manager. NEC.
3. Shri S. P. Dutta. Dy. Chief Mining Engineer. Tipong colliery. NEC.
4. Shri R. Mech. Sr. Manager (M)/Manager. Tikak Colliery. NEC.
5. Shri S. Bhattacharjee. Sr. Manager/Staff Officer (M). NEC.
6. Shri Malay Das. Sr. Manager (M)/EMLR.
7. Shri Arjun Chetry – Gaon Bura. Lekhpani & Tipong village.
8. Shri Naba Dutta. Councilor. Lekhpani Gaon Panchayat.
9. Shri Mohan Sharma. President. Lekhpani Mondal Congress Committee.
10. Shri Tehon Hakum. Gaon Bura. Malu Gaon. Tikak.
11. Shri Dattu Langsing. Gaon Bura. Mulang 3no village. Lekhpani.
12. Shri Lumtym Hakum. Member Malu Gaon Gram Sabha. Lekhpani.
13. Shri Jingkey Langchang. Village member. Phin Miro village. Lekhpani.
14. Limchon Hachang. Village member. Phin Miro village.
15. Changnonj Langching. Asstt. Gaon Bura. Mulang 3no. Village. Lekhpani.
16. Shri Ganesh Chetry. Village member. Lekhpani Nepali Gaon

ANNEXURE-4

**REPORT OF THE SUBGROUP NOMINATED BY THE
EAC (T&C) ON VISIT TO NIMBRI – CHANDWATAN
LIGNITE MINING PROJECT AREA OF M/S BINANI
CEMENT LTD. LOCATED IN NIMBRI VILLAGE, JAYAL
– DEGANA TEHSIL, NAGOUR DISTRICT (RAJASTHAN)**

**Ministry of Environment and Forests,
Government of India,
New Delhi**

June' 2012

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REPORT ON THE SITE VISIT TO NIMBRI - CHANDWATAN LIGNITE MINING PROJECT AREA OF M/S BINANI CEMENT LTD. LOCATED IN NIMBRI VILLAGE, JAYAL – DEGANA TEHSIL, NAGOUR DISTRICT (RAJASTHAN)

1.0 Background

- 1.1** The proposal of Environmental Clearance for the proposed Nimbri – Chandwatan Lignite Mine (5 MTPA) of M/s Binani Cement Ltd. In Village Nimbri, Tehsil Jayal – Degana, District Nagaur in Rajasthan was discussed for the **1st time** during 57th meeting of the **earlier** EAC (T&C) held on **28th – 29th Oct' 2009**. After detailed deliberations, the Committee observed as under:-

“The Committee observed that the life of the mine is merely 12 years and since the linked TPP requires an assured supply of lignite, the project does not appear to be feasible without long-term availability of lignite. The Committee desired to have the status of the EC for the linked TPP projects. The Committee noted that the persons are being provided employment under R&R for only a short period of 12 years only and would cease thereafter. The Committee noted that objections have been received on the proposed project from the locals and particularly in regard to loss of livelihood, loss of agricultural land especially irrigated land, and loss of wetlands found within the ML area. A letter dated 25.06.2008 has also been received from Krishi Zila Parishad, Nagaur, Govt. of Rajasthan, on the loss of agricultural land for the project. The Committee observed that the CGWA clearance is restricted to use of groundwater for drinking. The Committee further observed, that the details of treatment mine water with high TDS levels and disposal of brine sludge requires further details. The committee also observed that in view of presence of deeper confined saline aquifers in the area, the proponent should take adequate safeguards (including monitoring) for mining the deeper coal seams. In this context, the proponent explained that a detailed hydro-geological studies including pumping tests have already been conducted by them during EIA. Additionally, a specific study related to ‘strata depressurization’ has already been commissioned by them to ensure safe mining. The study will be completed within a period of two months. The Committee desired that the following additional information be sought on the hydrogeology issues:

- (i) The impact of mining on deeper and shallow aquifers & nearby ponds/water bodies.
- (ii) The issues on abstraction and disposal of saline water during dewatering of deeper confined aquifers.

- (iii) Disposal of sludge/ brines originating from RO Plant.
- (iv) Water Management plans during post mining period after cessation of mining activities.

It was further decided that Expert (Wildlife) would provide details on whether the 'nadis' found within the lease area are 'wetlands' identified in the Wetland Atlas of India. The Committee after discussions decided to further consider the project after receipt of the response of the PP, and response of the State Agriculture Dept., Govt. of Rajasthan regarding the loss of agricultural land and livelihood due to the project."

- 1.2** The Project was once again reviewed by the earlier EAC during **67th meeting** held on **22nd – 23rd March' 2010**, wherein the Committee had made following observations and decided to reconsider the Project on furnishing the requisite information sought from the Project Proponent:-

"The Committee noted that lignite from Nimbri Chandawat mine has been earmarked by the company for the 25 MW TPP located along with a Cement Plant at Sirohi for which an EC was granted vide MOEF letter dated J-11011/60/2006 dated 18.05.2006. The Committee noted that the proposed establishment of pit head TPP (for which a TOR has been granted on 10.09.2008) near this mine is not clear, since the entire lignite reserves of this mine have been committed for the TPP located in the premises of the Cement Plant at Sirohi and hence, the pit head TPP Project should be formulated only if committed supply of lignite reserves are identified for the proposed pithead TPP. The Committee observed that the Mining Plan prepared for this mine and approved by Ministry of Coal would require modification in view of the change in the Plan of Mining (reserves as well as life) and should be obtained before grant of EC. Details of mine development (for every 5 years) until end of mine life and post mining landuse should be presented. The Committee desired that detailed geological cross sections (in addition to lithologs) should be presented. The Committee desired that a detailed Risk Assessment Study and a Disaster Management Plan should be formulated in case mining ruptures the confined aquifer, keeping in view the volume of water and quality. It further recommended that mining should be stopped immediately until the Plan is implemented. The Committee desired that use of saline water for dust suppression

and green belt development should be avoided as it may contaminate the soil/ecology of area, which would become degraded into a 'salt pan'. The Committee desired that the mine water with high levels of TDS be treated in a RO Plant or using US based technology and a safe method of disposal of the brine sludge in concrete lined pits or sold to consumers for which a long term MOU should be entered into. The Committee desired that a provision of Rs 5 crores or 0.4% of the total capital costs (whichever is higher) should be earmarked for CSR and a Corpus Fund created for the maintenance activities.

The Committee after discussions decided to further consider the project upon furnishing a detailed Risk Assessment-cum-Disaster Management Plan for the actual quantum of water coming out/discharge. In addition, multiple strategies should be worked out for the treatment and disposal of brine water and sludge and presented before the Committee.”

- 1.3** The proposal for Environmental Clearance (EC) based on TOR for open cast mining (0.5MTPA in an ML area of 350 ha) of Nimbri - Chandwatan Lignite block allotted to M/S Binani Cement Ltd. by the Ministry of Coal for captive use in the linked TPP at Sirohi was reconsidered by the present EAC (T&C) in its meeting held on **29th-30th August 2011**. The EAC recommended the project for EC, but the Hon'ble MEF desired necessary clarifications on the nature of waterbodies found in ML area based on the representations along with photo album submitted by locals as to whether waterbodies represent wetlands or not. Ministry got the issue examined by an expert (Dr Asha Rajvanshi) from Wildlife Institute of India, Dehradun. After examining the photographs depicting waterbodies and their surroundings submitted to the Hon'ble MEF by locals, the Expert from WII expressed that the pictures of waterbodies in photo album do not represent unique habitat or important wetland areas (vide email 23rd April 2010). Based on the information furnished by the WII expert, the file was resubmitted by the Ministry officials to Hon'ble MEF on 01 November 2011 for her kind approval of EC to the project.
- 1.4** It was decided by MoEF that the views of the Space Application Centre (SAC), Ahmadabad should also be sought as it was involved in the preparation of 'Wetlands Atlas'. Accordingly the matter was discussed with the project proponent who approached the SAC for mapping wetlands in the ML area (vide BCL/NLM/SAC/2011/392 dated 2nd December 2011). The Space Application Centre (vide, email of 3rd February 2012) provided the maps of ML area depicting the wetlands. The SAC referred to the waterbodies as wetlands and mentioned that there were 13 wetlands within ML area, of which 11 were less than 2.25 ha in size and two wetlands were more than 2.25 ha in size.

- 1.41** Since the SAC referred to these waterbodies as wetlands, the MoEF decided to once again refer the maps provided by SAC along with the photo album supplied by locals to the Wildlife Institute of India, Dehradun for their specific comments on:
- (i) whether the wetlands referred by SAC are important Ramsar sites (listed under the Ramsar Convention on wetlands) or not and
 - (ii) whether these wetlands have been performing important ecological functions in and around the project area.
- 1.5** Dr V. B. Mathur (Wildlife Institute of India), who is a member of EAC (T&C), examined all the relevant documents, besides the maps provided by SAC and photo album provided by locals and opined that the waterbodies were not notified Ramsar Sites and might have cultural, religious standpoints besides providing a range of livelihood resources to the locals. He, further recommended that a subcommittee of EAC (T&C) should visit the site and assess how the concerns of local communities could be harmonized vis-à-vis the development needs through effective CSR implementation by the project proponent.
- 1.51** The EAC (T&C) in its meeting held in February 2012 considered the information provided by SAC and Report of Dr V. B. Mathur, and decided that a subgroup comprising of Shri T.K Dhar, Professor C. R. Babu and the Director, MoEF should visit the site and assess the nature and functions of waterbodies and also to interact with locals and district/taluka officials on their views on the project.

2.0 Site Visit

Professor C. R. Babu, Sh T. K. Dhar and Dr T. Chandini visited the project site from **1st- 3rd May 2012**. The project proponent represented by Shri S. R. Jani, Vice-President (Geology & Mining) along with his team of other officials of the project accompanied the subcommittee during the visit. The Sub-divisional Magistrate of the area and the Revenue Officials also joined the subcommittee at Nimbri village.

3.0 The Project Details

The Nimbri – Chandwatan Lignite block is located at Nimbri - Chandwatan, Degana Tehsil, Nagaur District, Rajasthan. The lignite block covers over an area of 56.40 sq.km, of which geological exploration work was carried out over 3.5sq.km. The mine lease (ML) area is 3.5 sq.km (350 ha). The ML area encompasses lands of 2 revenue villages - Nimbri and Kuchera which are located 2.5km and 4.5 km from the project site, respectively. The ML area does

not include the villages but encompasses their lands. The ML area includes 190.13 ha (3.64 ha Government land + 6.74 ha grazing land + 179.75 ha of private land) belonging to Nimbri village and 159.87 ha (9.32 ha Government land, 37.01 ha of grazing land and 113.54 ha of private agricultural land) belonging to Kuchera village. The mode of mining is open cast with 0.5MTPA, and the lignite is meant for their captive Power Plant located at Sirohi about 350km from the project. The 293.29 ha private land is prime agricultural land that yields three crops in a year and is irrigated by tube-wells. The striping ratio is 1:33. The working depth of mine will be 90m bgl (221m RL) and water table varies from 60-70m bgl. The confined aquifer containing brackish/saline water has been reported at a depth of 97m or more. Of the total ML area, the quarry area is about 280.69 ha, area for storage of top soil is 3.38 ha, external OBD is 55.996 ha, infrastructure is 0.35 ha, roads is 1.5 ha and green belt is 8.4 ha. At the end of mining it is proposed that 179.41 ha of total 280.41 ha of excavated area will be backfilled and reclaimed as agricultural land and a void of 101 ha will be left for ground water recharge. Transportation of coal from mine to CPP is proposed by road.

About 40 landowners out of total 107 landowners live in the lease area and others use land for agriculture and their houses are located in the villages outside the lease area.

4.0 Observations on the site proposed

4.1 Farm lands

The ML area is a flat fertile agriculture land interspersed with grazing lands and Nadis (Figure). The surface drainage of 375 mm annual average rainfall is drained into several scattered low lying depressions locally known as 'Nadis' which are common areas. The soil appears to be sandy loam with relatively high infiltration rates. There are several tube wells used to raise a minimum of 3 crops per year or more depending upon the growth seasons of crops. Many farms have *Foeniculum*, *Allium*, many vegetables, *Trigonella*, *Brassica*, *Cuminum* and *Coriander*. During monsoon, crops such as moong, moth, guar, bajra and til are grown and during winter wheat is grown extensively.

4.2 'Nadis'

These are low lying natural depressions which receive surface drainage from the surrounding fields and grazing lands. These unique landforms not only recharge ground water but also provide water for irrigation, and drinking and serve as water source for livestock and wildlife and bathing & washing. The locals have been expanding and deepening these 'Nadis'. Further, crescent shaped embankments have also been constructed on the side where there were no surface drainage channels. All surface drainage channels pour their contents into 'Nadis'. Some of the 'Nadis' are associated with strong religious local beliefs and cultural values. The 'Nadis' are an integral part of the lives of locals. There are

100's of *Prosopis cineraria* trees scattered all over the fields and grazing lands. A number of Neem trees were also observed scattered over the area. These trees are important resources for feeding livestock and also caters for fire wood.

As per the details furnished by SAC, there are 2004 small wetlands (less than 2.25 ha in size) and 344 large wetlands (more than 2.25ha in size) in the district Nagaur.

Within ML area of the proposed project, 13 Nadis are located; out of these 13 Nadis 11 are smaller in size (less than 2.25 ha) and two are comparatively larger in size (more than 2.25 ha in size). Of the two larger Nadis, one is located at Nimbri – Chandwatan and this is of 2.25 ha in size and the other is of 2.43 ha and it is located at Butati village (Annexure I). The subgroup visited 3 small Nadis and two large Nadis located at Nimbri and Butati villages.

The grazing lands (Gauchar lands) around these 'Nadis' are also critical for livestock as well as for herbivores such as Chinkara. Birds such as Red Wattled Lapwing was found during the visit. In other words 'Nadis' are a good life supporting systems in arid/desert areas.

These Nadis are unique desert landscapes that hold water from large catchment and has sediment characteristic of wetlands. These low lying depressions together with surface drainage channels have been modified by local communities by making crescent shaped embankment on sides where surface drainage is absent and open to larger flat area. In fact, on Nimbri Nadi, a brick wall with 4 to 6 feet openings at 5 to 6 feet level from elevated ground was erected for spill over from the Nadi into another low lying area. Moist loving plant species such as *Glinus lotoides* and *Polygonum* were observed on the cracked clayey sediment. Butati village Nadi is large and its catchment is enormous. It is very close to a famous temple which is visited by 1000s of pilgrims including paralytic patients who have been getting divine relief. Pilgrims take holy dip in the Nadi. As such Nadi has religious and cultural values.

Both the SDM and Patwari confirmed that the Nadis and grazing lands are areas meant for common use of locals.

4.3 Mine void and confined saline aquifer

As per the mining details given by the project proponent that the mining is only up to 90 m depth and the saline confined aquifer is at 97 m depth, and as such the mine does not accumulate saline water. The project proponent also mentioned about a RO Plant to treat 450 m³/d mine water. This suggests that the 101 ha void left out after mining contains only saline water and the fresh water entering into void is bound to get mixed with saline water thereby rendering an important fresh water resource getting polluted and rendering it unfit for any use.

5.0 Interface with Gram Panchyat members, Patwari, SDM and Project Proponent

The subgroup, after visiting the Nadis, interacted with villagers, Gram Panchyat members, Patwari and SDM of the area and project proponent at village Panchyat Building. After brief introduction by SDM of the area, the Director, MoEF explained about the project. The members of Panchyat of Nimbri were unanimous by expressing that they would under no circumstances give their lands that contain trees and the Nadis which were an integral part of their livelihoods. The project proponent also tried to convince Panchyat members that many benefits would be provided to them under CSR, but they did not yield to the promises made by the project proponent. They also raised the pathetic and pitiable conditions of villagers who had already surrendered their lands to the present project proponent as well as to Ambuja Cement Ltd. in the neighboring area. In fact they submitted a memorandum to the Director, MoEF (**Annexure I**).

6.0 Conclusions

Based on the observations made on the landscape of the ML area and the 'Nadis' (wetlands/waterbodies) and the analysis of mining details given by the project proponent, the maps provided by SAC and the report submitted by Dr V. B. Mathur of Wildlife Institute of India, a member of EAC (T&C), the following conclusions are drawn:

- 6.1 The 'Nadis' (wetlands/waterbodies) are unique landforms that support life in arid/desert area of Nagaur. These low lying depressions receive surface drain from vast flat landscapes and hold water for short/long periods depending on the catchment size. The local communities, over a period of time, deepened the basin of these Nadis and erected crescent shaped embankments on side where there were no surface drainage channels. These 'Nadis' not only recharge ground water and provide adequate water for irrigation, drinking, bathing and washing but also serve as water source for livestock and wildlife. Above all, these Nadis and the surrounding grazing lands form habitat for birds and wildlife such as Chinkara. In short there will be no life in the absence of Nadis which are life supporting systems. Butati Nadi has a highly religious and cultural significance.
- 6.2 More than 83% of ML area is flat agricultural land that support three crops per year with the help of tube well irrigation. Further, these agricultural fields harbour 100's of trees of *Prosopis cineraria* – the tree of life in desert and *Acacia* – that provide fodder and fire wood and substantial number of Neem trees which provide fire wood as well.
- 6.3 The Gram Panchyat members of Nimbri have refused outright to part their lands for the project and also emphasized that the Nadis and grazing lands are an integral part of their livelihoods and would not be allowed to be disturbed under any circumstances.

- 6.4** The mine void 101 ha at the end of mining may contain only saline water as the mining may disrupt saline confined aquifer and huge quantity of rain discharged into void will also ultimately become saline. This will have a negative impact on the recharging of ground water.
- 6.5** The villagers of Nimbri Village have once again given a jointly signed Memorandum to the Director, MoEF vehemently refusing to part with their their good and fertile lands. During the meeting, the subgroup had with the villagers at Panchayat Bhawan on 2nd May' 2012 at 10 30 AM, in presence of SDM, Tehsildar, Naib Tehsildar, etc. and other revenue officials and Project Proponents, the villagers outrightly rejected handing over their lands, that provide 2 to 3 crops a year for them categorically mentioning that those land oustees whose lands were taken in the last by the Power Proponent and even by other cement companies in the vicinity, have already lost their moorings and become paupers. The villagers also informed the subgroup that the Public Hearing was held in a hush hush manner about 30 kms away from the proposed project site. When power proponents mentioned that a good CSR amounting to one time capital budget of Rs 5 crores and thereafter 1.5 crs every year would be carried out, till the operation of the mine, the villagers categorically rejected the same mentioning that no amount of CSR activities and / or other avenues of giving employments etc. would suffice and meet their requirements vis-à-vis their losing these good fertile lands giving them 2 to 3 crops annually.

7.0 Recommendation

In the light of above observations made by the subgroup, after their site visit, the subgroup strongly feels that there is an imperative need for the full EAC to review threadbare the Project in its entirety before a decision could finally be taken in the matter either to recommend the Project for EC despite strong resistance by the locals or to withdraw the earlier recommendations of EC.

ACKNOWLEDGEMENT

The subgroup would like to acknowledge the logistic support rendered by the officials of Rajasthan Mineral Development Corporation during their site visit.

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Sd/-
(Prof. C. R. Babu)
Chairman Subgroup

LOCATION OF 13 NADIS IN NIMBRI-CHANDAWATAN COALMINE BLOCK

