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Ref: REL/Talabira-1/MoEF&CC/2019/Nov-1

Date: 06/11/2019

To
The Regional Officer,
Ministry of Environment and Forest & Climate Change
Easteren Regional Office, A/3, Chandrashekhapur,
Bhubaneshwar- 751023

Subject: Submission of six monthly compliance status of environment clearance no J-11015/58/2009-IA.II dated 08.11.2011 and its amended, dated on 16.04.2015 for Talabira-1 Opencast Coalmine Project at village Kinda, Tehsil Rengali, District Sambalpur Odisha for the period of April to September 2019.

Ref: Environment clearance no J-11015/58/2009-IA.II dated 08.11.2011 for Talabira-1 Opencast Coalmine

Dear Sir,

With reference to the above, please find enclosed six monthly compliance status of environment clearance for the period of April 19- September 19. We hope you will find this satisfactory and in line with requirement.

Thanking You,
For, Raipur Energen Limited (A subsidiary of Adani Power Limited)
Authorized Signatory

Bhatnagar 6/11/19

(Jatinder Bhatnagar)
E-mail: Jatinder.Bhatnagar@adani.com
Phone No: (079) 255 58796, Fax No: (079) 255 57177
Enclosures: As above Referred

CC:
1. Member Secretary, Central Pollution Control Board, Parivesh Bhavan, East Arjun Nagar, New Delhi- 110032
2. Member Secretary, Odisha Pollution Control Board, College Road, Keonjhar, Odisha 758001

Raipur Energen Limited
(Formerly Known as GMR Chhattisgarh Energy Limited)
Adani Corporate House
Shantigram, S G Highway
Ahmedabad 382 421
Gujarat India
CIN : U40108KA2008PLC047974

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Fax +91 79 2555 7177
info@adani.com
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Registered Office: Skip House, 25/1 Museum Road, Bangalore Karnataka – 560025, India

GOVT. OF INDIA
MoEF & CC, Eastern R.O.
Bhubaneswar-751023
07 NOV 2019
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CERTIFIED TRUE COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF RAIPUR ENERGEN LIMITED ("THE COMPANY") AT ITS MEETING HELD ON MONDAY, 5TH AUGUST, 2019 AT ADANI CORPORATE HOUSE, SHANTIGRAM, NEAR VAISHNODEVI CIRCLE, AHMEDABAD – 382 421, GUJARAT.

To authorize Directors/Officers for representing the Company before various authorities like Central Electricity authority, State Pollution Control Boards etc.

"RESOLVED THAT Mr. Jatinder Bhatnagar, Authorised Signatory or Mr. Santosh Kumar Singh, Authorised Signatory or Mr. Balbir Sodhi, Authorised Signatory or Mr. Rambhav Gattu, Authorised Signatory be and are hereby severally authorized to make necessary applications, file various documents from time to time to Ministry of Environment & Forests, Central Electricity Authority for Long Term or Short Term Coal Linkage, Ministry of Defense for getting NOC, State Pollution Control Boards, Airport Authority of India, Railway Authority of India, Industrial Commissionerate office, Government of Chhattisgarh, Government of India, State DISCOM, Water Resource Department and Central Ground Water Board etc. and sign other necessary letters/applications, agreements, deeds, documents, undertakings, papers etc. required for above statutory approvals/clearances."

Certified True Copy

Certified True Copy

For Raipur Energen Limited

M R Krishna Rao
Director
DIN: 06495315

RAIPUR ENERGEN LIMITED

Raipur Energen Limited (Formerly known as GMR Chhattisgarh Energy Limited)

Adani Corporate House
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Gujarat India
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Registered Office: 25/1, Skip House, Museum Road, Bangalore 560025, India

Talabira -1 Coal Mine Project

Status of Half yearly Compliance w.r.t Environmental Clearance No. J-11015/58/2009-IA.II (M) dated 16th April 2015

(For the period April 2019– September 2019)

A. Specific conditions:

Sl. No.	Conditions	Compliance status
(i)	Production of coal shall not exceed 3.0 MTPA. The project proponent shall obtain prior EC for expansion in production beyond 3.0 MTPA.	Coal production from April' 2019 to September'2019 is Nil. The coal production was 0.560, 0.156 and 0.270 Million Metric Tons (MT) during FY 2015-16, 2016-17 and 2017-18, respectively. **Thus, Complied.**
(ii)	No coal washery shall be established without prior EC from this MOEF.	No washery has been established at Mine site till date. **Thus, Complied.**
(iii)	No fly ash shall be dumped into the de-coaled voids without prior approval of the MOEF.	No fly ash is dumped into the de-coaled voids till date. No fly ash will be dumped without prior approval from MoEF & CC. **Thus, Complied.**
(iv)	The embankment shall be stabilised with stone pitching on the reservoir side and compacted and plantation using a mix of native species shall be developed. Additional safety and protection measures including continued operation of high capacity pumps shall be in operation to prevent mine inundation. Prior approval of disaster management plan shall be obtained.	As per initial EC dated 08/11/2011, originally issued to M/s Hindalco Industries Ltd, embankment related activities have already been executed by the prior Mine Allottee (M/s Hindalco) under the guidance of DoWR, Odisha. The embankment is of 1.92 Km length and 1.5 m height and 10 m wide at the top and 3 m above the HFL of Hirakud Reservoir. The embankment has been stabilised with side-sloping on either side and plantation using a mix of native species is developed. There is a provision of high capacity pump for de-watering. The disaster Management plan is in place and submitted to Directorate of Mines Safety also. **Thus, Complied.**

Sl. No.	Conditions	Compliance status
(v)	Top soil, if generated, should be properly stacked with proper slope at earmarked dump site (S) with adequate measures and shall be used for reclamation and development of green belt and for reclamation of back filled quarry should be used for reclamation and rehabilitation of mined out areas within a year of generation.	After taking over by GMR, Topsoil of 8,000 Cubic Meter had been spread over the external dump slope to facilitate Bio-reclamation and 12,000 Cubic Meter has been conserved in external Top soil dump and 8,925 Cubic meter has been preserved and properly stacked in internal top soil dump up to 31st March 2018. Reclamation of back filled quarry and rehabilitation of mined out area will be done as per approved mine closure plan. No generation of top soil from mine since April' 2018 as mining operations were suspended. **Thus, Complied.**
(vi)	The entire OB generated in the expansion project shall be back filled and reclaimed and stabilized with plantation using a mix of species found in the reserve forests in the buffer zone. Monitoring and management of the existing reclaimed dump site shall continue until the vegetation becomes self-sustaining and no dumping of OB on reclaimed dumps shall be permitted. Compliance status shall be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar on yearly basis.	OB generated by prior allottee was stacked in three external dumps (Dump- 1, Dump- 2 & Dump- 3). Mine closure activities such as back filling, reclamation & stabilization with plantation will be done as per approved Mine Plan & Mine closure plan and status of compliances will be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar on yearly basis. **Thus, Complied.**
a	Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected shall be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly de - silted and maintained properly. Garland drains (Size, Gradient & Length) and sump capacity shall be designed keeping 50% safety margin over & above the peek sudden rain fall and maximum discharge in the area adjoining the mine site. Sump capacity also provide adequate retention period to allow proper settling of silt material.	Catch drains of average width 2.5 m and length 2.9 Km had been constructed and maintained along the toe of OB dumps. Water is collected in mine sump which is being utilized for water spraying in mine area, roads, green belt development etc. The drains are cleaned before every monsoon and maintained properly. Garland drains & sump capacity are designed by taking factor of safety 2.0 to deal with the sudden rain fall. There are no adjoining mines. **Thus, Complied.**
(viii)	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check the run-off and siltation shall be based on the rain fall data.	Retaining wall at the toe of the dumps and OB benches within the mine to check the run-off and siltation is done by prior allottee. Maintenance & periodic repair of

Sl. No.	Conditions	Compliance status
		retaining wall has been undertaken by Raipur Energen Limited (Erstwhile, GMR Chhattisgarh Energy Limited). **Thus, Complied.**
(ix)	Mist type water sprinkling system shall be provided to check fugitive emissions from conveyor system, haulage roads, transfer points etc. Water sprinkling (Fixed & Mist type, mobile) shall be regularly carried out along the main haul roads.	There is no conveyor system in Talabira-1 mine. Mine operations are temporarily suspended. During mine operation, mist type mobile tankers are used to water sprinkling along haul roads, stock yards, transfer points etc. **Thus, Complied.**
(x)	No blasting shall be carried out.	No blasting practice is adopted in mine. **Thus, Complied.**
(xi)	A feasibility plan for transportation of coal to the railway siding by closed overhead conveyors shall be prepared and furnished to the MOEF within 6 months.	Feasibility plan for transport of coal to railway siding by closed overhead conveyor has been submitted by M/s REL after taking over the mine in April, 2015 **Thus, Complied.**
(xii)	Area brought under afforestation shall not be less than 137.905 Ha which includes reclaimed external OB dump area (45 Ha), backfilled area (60 Ha), along ML boundary, green belt (28.905 Ha) and top soil dump area (6.0 Ha) by using a mix of species found in the natural forests in the buffer zone in consultation with the local DFO / Agricultural department. The density of the trees shall be around 2500 plants per Ha.	37940 No's of additional saplings were planted by REL in addition to Green belt area developed. Total 33.79 Ha within mining lease area is covered with plantation. Back filling, Reclamation & plantation work will be carried out as per approved mine plan & mine closure plan after exhaustion of coal in mine. **Thus, Complied.**
(xiii)	A progressive mine closure plan shall be implemented and OB generated during the balance life of the mine shall be concurrently back filled and the area reclaimed with a mix of native species and at the end of mine life the balance area 24.4 Ha of de-coaled void shall also be reclaimed with the OB and the entire worked out area shall be back filled up to ground level. There shall be no water bod created at the post – mining stage.	Back filling in de-coaled void, reclamation & plantation work will be carried out as per approved mine plan & mine closure plan. Revised Mining plan and mine closure plan submitted in October'2016 was not approved. The existing mine plan & mine closure plan is already expired on 31.03.2018. . As on date, company is not authorized to take any activity related to mining in mine, without

Sl. No.	Conditions	Compliance status
		approved mining plans from Ministry of Coal for Talabira-1 mine.
(xiv)	A conservation plan comprising for in-situ and ex-situ conservation of schedule I and II, Fauna found within the core & buffer zone shall be implemented in consultation with the State Govt. for the balance life of the project and include a plan for habitat restoration at the post mining stage and which also includes a plan for development of 150 Ha of grass lands for the elephants visiting the area. The activities there under along with status of implementation (including expenditure) shall be regularly reported as part of the compliance reports furnished to MOEF RO, Bhubaneswar and also uploaded on the company website.	Conservation plan including plan for habitat restoration at post mining stage has been prepared which is duly approved by Chief Wildlife Warden (CWLW). Approved amount of Rs.257 Lacs has been deposited with PCCF, Orissa for implementation of above conservation plan. Conservation plan and status of implementation were submitted to RO MOEFC, Bhubaneswar and also uploaded on our website. Web-link: https://adanipower.com/Downloads Approved plan, Approval letter of conservation plan, payment letter for implementation of conservation plan, Screenshot of the web link, and are attached as Annexure-1. **Thus, Complied.**
(xv)	Regular monitoring of ground water level on the quality shall be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity shall be done four times in a year pre-monsoon (May), monsoon (August), Post- Monson (November) and winter (January) seasons and for quality in May. Monitoring of heavy metals including mercury shall be carried out and data furnished as part of the compliance report. Data, thus collected shall be submitted to the Ministry of Environment & Forests and to the central Pollution Control board quarterly and regularly uploaded on the company website.	A NABL accredited testing agency has been appointed for monthly monitoring of the ground water. It is being collected from the existing wells at the nearby villages and also from piezometer installed in front of site office of Talabira-1 mine. Analysis of ground water is being done by NABL certified lab and report is being submitted on quarterly basis to the office. Photographs of Installed piezometer are attached as Annexure-2 Environmental monitoring report are attached as Annexure-3 Six month compliance report including environmental monitoring report has been uploaded on the company website. Website Link: https://adanipower.com/Downloads

Sl. No.	Conditions	Compliance status
		Thus Complied.
(xvi)	The extent of use of water in the mining operations shall be reduced by recycling and reuse. The company shall put up artificial ground water recharge measures for augmentation of water resource if the water table shows a declining trend. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine. Mine water to be discharged into the Hirakud reservoir shall be treated to prescribed standards before discharge.	Only stagnated water in the sump of mine is being used for mining operations and plantation. Water is contained in the pits within ML, which facilitates recharging the ground water. Hirakud reservoir backwater is adjacent to the mine. Hence, ground Water table varies according to the level of Hirakud reservoir back water. REL is supplying water to nearby villages by 6 no's of water tankers throughout the year. No water from mine is being discharged to Hirakud Reservoir. **Thus, Complied.**
(xvii)	Besides carrying out regular periodic health check-up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any through any local/regional health institutions and the results reported to the this ministry and to DGMS.	Periodic health check- up including occupational disease and hearing impairment was done as per Rule 29 (b) of Mining Rules, 1955. There was no occupational disease and hearing impairment to any workers. **Thus, Complied.**
(xviii)	For monitoring land use pattern and for post mining land use, time series of land use maps, based on satellite imagery (on a scale of 1:5000) of the core zone and buffer zone, from the start of the project, until the end of the mine life shall be prepared once in three years (for any one particular season which is consistent in the time series), and the report submitted to MOEF and its regional office at Bhubaneswar.	The land use analysis based on satellite imagery for core zone of the mine including the land use of 10 km buffer zone has been done for 2015 and 2018. Land use analysis report is attached herewith as annexure- 4. **Thus, Complied.**
(xix)	A detailed Final Mine Closure Plan along with details of corpus fund submitted to the Ministry of Environment & Forest which shall be implemented from 2017-18. The time period for reclamation shall be completed within a year of completion of project. The plan for habitat restoration plan for a minimum period of five years (under the MMDR Act) shall be under taken after completion of	All the provisions of mine closure plan will be implemented after the approval of mine plan and mine closure plan as previous plan is expired on 1st April, 2018.

Sl. No.	Conditions	Compliance status
	reclamation in consultation with and a joint inspection carried with the state forest department.	
(xx)	CSR would be implemented in 8 villages – Talabira, Nua Khinda, Purana Khinda, Lapanga, Bhudiapalli, Matul Camp, Behara Munda and Mundapara. Budgetary provisions at @ Rs. 10 per tonne of Coal should be made for CSR activities. The socio-economic development of the villages shall be monitored over the life of the project using UNDP. Human development indices and reported as part of the report submitted to MOEF RO, Bhubaneswar.	Budgetary provision of @ Rs 10/ Ton of coal was kept. Total Expenditure made for CSR activities by REL (Since inception- April'2015 to Aug'2019) is Rs **1, 42, 88,914.00**. Mine operations are temporarily suspended since 1st April' 2018. Preliminary report on socio-economic development of the villages has been Prepared. Report is attached herewith as annexure-5 Company shall be taking socio economic development assessment in the area every three years after the approval of revised mining plan. **Thus, Complied.**
B.	**General Conditions**	
(i)	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forest.	There is no change in mining technology in mines. **Thus, Complied.**
(ii)	No change in the calendar plan including excavation, quantum of mineral coal and waste shall be made.	Adhered to the mine plan. **Thus, Complied.**
(iii)	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for monitoring PM10, PM 2.5, SO2, NOx and heavy metals such as Hg, Pb, Cr, As etc. Location of the stations shall be decided based on Meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the state pollution control board.	5 numbers Ambient air quality monitoring stations are established in core zone as well as in the buffer zone for monitoring PM10, PM 2.5, SO2, NOx and heavy metals such as Hg, Pb, Cr by external agency (Approved by MOEFC / NABL) and report is being submitted to MOEFC, Bhubaneswar on quarterly basis. Recent Environmental Report is uploaded in company website. Website Link: https://adanipower.com/Downloads **Thus, Complied.**
(iv)	Data on ambient air quality (PM10, PM 2.5, SO2, NOx and heavy metals such as Hg, Pb, Cr, As etc.) shall be regularly submitted to the ministry including its	Data on ambient air quality (PM10, PM 2.5, SO2, NOx and heavy metals such as Hg, Pb, Cr, As etc.) is being monitored on quarterly basis by

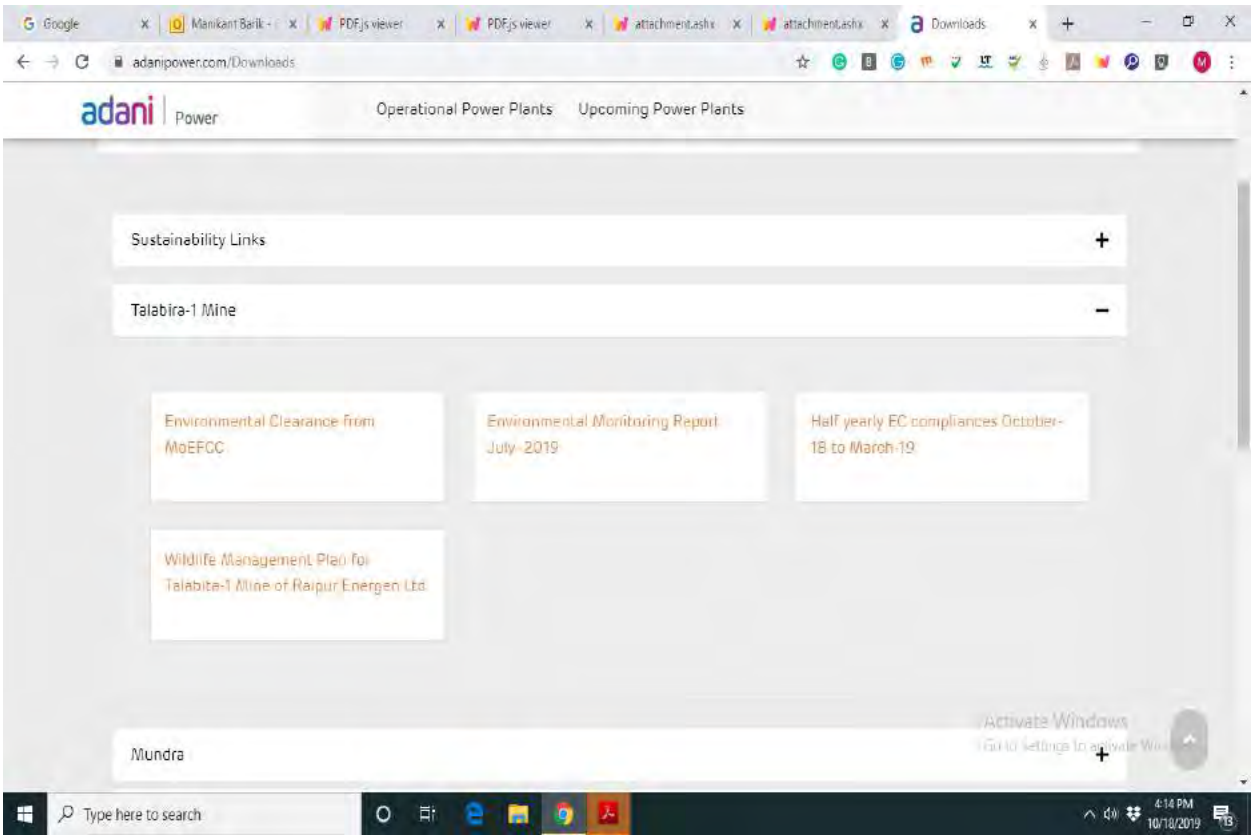
Sl. No.	Conditions	Compliance status
	regional office at Bhubaneswar and to the State Pollution Control Board and Central pollution Control Board once in Six Months.	external agency (Approved by MoEFCC / NABL) engaged for this purpose and reports are being submitted to the concerned authorities. Recent Environmental Report is uploaded in company website. Website Link: https://adanipower.com/Downloads **Thus, Complied.**
(v)	Fugitive dust emissions quality (PM10, PM 2.5 and heavy metals such as Hg, Pb, Cr, As etc.) from all the sources shall be controlled regularly monitored and data recorded properly. Water spraying arrangement on haul road, wagon loading and dump trucks (Loading & un loading) points shall be provided and properly maintained.	Fugitive dust emissions quality (PM10, PM 2.5 and heavy metals such as Hg, Pb, Cr, As etc.) from all the sources are being monitored by external agency (Approved by MOEFC / NABL) and reports are being submitted. During mine operation, water spraying arrangement on haul road, wagon loading and dump trucks (Loading & un loading) points were provided and maintained. Recent Environmental Report is uploaded in company website. Website Link: https://adanipower.com/Downloads **Thus, Complied.**
(vi)	Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc. shall be provided with ear plugs/muffs.	Noise within ML is well below the stipulated norms. Ear plugs/muffs are also issued to HEMM operators. No drilling & blasting is practiced in mine. **Thus, Complied.**
(vii)	Industrial waste water (workshop and waste water from the mine) shall be properly collected, treated so as to confirm to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	Grease and Oil Trap has been provided in the workshop to treat the waste water. The treated water is being stored and reused for water spraying and cleaning of vehicles in the wash bay. **Thus, Complied.**
(viii)	Vehicular emissions shall be kept under control and regularly monitored.	During the mine operation, regular maintenance of vehicles was being

Sl. No.	Conditions	Compliance status
		done to control the vehicular emissions. **Thus, Complied.**
(ix)	Environmental laboratory shall be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.	Pollution monitoring and analysis is being done regularly by external agency (approved by MOEFC / NABL) engaged for this purpose. Recent Environmental Report is uploaded in company website. Website Link: https://adanipower.com/Downloads **Thus, Complied.**
(x)	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects. Occupational health surveillance programme of worker shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed. A separate environmental management cell with suitable qualified personnel shall be set up under the control of senior executive, who will report directly to the Head of the company.	Dust masks were issued to all employees working in dusty environment. Initial & refresher training was imparted to contractual employees as per Mines Vocational Rules 1966, Periodical Medical Examination of 140 no's of employees were conducted to observe any contractions due to exposure to dust. **Thus, Complied.**
(xi)	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted to other purpose. Year-wise expenditure shall be reported to this Ministry and its Regional Office at Bhubaneswar.	There is a separate cost centre maintained for the fund earmarked for environmental protection. Total expenditure incurred towards Environment protection measures is as follows: FY 2015-16: Rs.62.61 Lacs FY 2016-17: Rs. 118.23 Lacs FY 2017-18: Rs. 89.48 Lacs FY 2018-19: Rs. 2.5 Lacs **Thus, Complied**.
(xii)	A copy of the environmental clearance shall be marked to concerned Panchayat / local NGO, if any, from whom any suggestion/representation has been received while processing the proposal.	This EC was originally issued to M/s Hindalco in 2011 and in 2015 the EC was transferred to M/s REL ((Formerly GMR Chhattisgarh Energy Ltd). Copy of the Environmental Clearance (EC) and Public Notice Advertisements in Newspapers

Sl. No.	Conditions	Compliance status
		related to EC have been displayed in Panchayat Office, Khinda and Sambalpur. **Thus, Complied.**
(xiii)	Sate Pollution Control Board shall display a copy of clearance letter at the Regional Office, District Industry Centre and Collectors Office/ Tehsil Office for 30 days.	-----
(xiv)	The project authorities shall advertise at least in two local newspapers widely circulated around the projects, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of clearance letter is available with State Pollution Control Board and may also been seen at the website of the Ministry of Environment & Forrest at http://envfor.nic.in. The compliance status including data on monitoring of environmental quality (air, water and noise) shall also be uploaded by the project authorities in their website and also at their main gate of project premises and office so as to bring the same in the public domain.	Advertisements have been published in two local newspapers of Odisha state namely Samay (Dt.01.10.2016, Odia news paper) and in Dainik Jagaran (Dt.01.10.2016, Hindi news paper). Data on monitoring of environmental quality (air, water r& noise) and status of compliance have been uploaded in the company's website. Web-link : https://adanipower.com/Downloads **Thus, Complied.**
(3)	The Ministry or any other competent authority may stipulate any further condition for environmental protection.	----
(4)	Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract the provisions of the Environment (Protection) Act, 1986.	-----
(5)	The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rules. The proponent shall ensure to undertake and provide for costs incurred for taking up remedial measures in case of soil contamination, contamination of groundwater and surface water and occupation and other diseases due to the mining operations.	----

ANNEXURE – 1

(Details of Screenshot, Payment, Approval letter and Wildlife Conservation Plan)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Downloads
adanipower.com/Downloads
adani | Power
Operational Power Plants
Upcoming Power Plants
Sustainability Links
Talabira-1 Mine
Environmental Clearance from MoEFCC
Environmental Monitoring Report July -2019
Half yearly EC compliances October-18 to March-19
Wildlife Management Plan for Talabira-1 Mine of Raipur Energen Ltd.
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10/18/2019

OFFICE OF THE DIVISIONAL FOREST OFFICER,
SAMBALPUR FOREST DIVISION,
Near Jail Chowk
e-mail id – dfosouthsbp@yahoo.com
Phone/FAX- 0663-2410139
Memo No. 1391 Dated. 28.3.16

To,

The Addl. Principal Chief Conservator of Forests,
(Forest Diversion & Nodal Officer, F.C Act)
O/o the Principal Chief Conservator of Forests,
Odisha

Sub: Submission of details pertaining to transfer of funds received from the M/S Hindalco and M/S GMR Chhattisgarh Energy Limited in respect of Talabira I Coal Mine transferred to M/S GMR Chhattisgarh Energy Limited-Transfer of lease in respect of diversion of 49.62 ha (4.16 ha + 45.46 ha).

The required information on details of transfer of funds received from the user Agency namely M/S Hindalco and M/S GMR Chhattisgarh Energy Limited in support of transfer of lease of diversion of 49.62 ha (4.16 ha + 45.46 ha) in Talabira I Coal Mine, is enclosed herewith in respect of this Division.

Sadas
Divisional Forest Officer
Sambalpur Forest Division

Memo No_____/4F Dated_____

Copy alongwith the enclosure forwarded to the Regional Chief Conservator of Forests, Sambalpur for favour of information.

Divisional Forest Officer
Sambalpur Forest Division

Proforma for submission of details pertaining to transfer funds received from the user Agency in Adhoc CAMPA.

Name of the Project:- Talabira Coal Mine, Khinda

1	Name of the Regional Office	Addl. Principal Chief Conservator of Forests, (Forest Diversion & Nodal Officer, F.C Act) O/o the Principal Chief Conservator of Forests, Odisha.	
2	State/District/Forest Division to which the proposal relates	Odisha/Sambalpur/Sambalpur Forest Division.	
3	Name of the user Agency/Nature of proposal	GMR Chhattisgarh Energy limited/Diversion of forest land for Coal Mine.	
4	Extent of forest area involved	4.16 ha (including safety zone 0.11 ha) of forest land addition to 45.46 ha of forest land already diverted in Talabira I Coal Mines lease area of 170.305 ha by Hindalco Industry Limited subsequently transferred in favour of M/S GMR Chhattisgarh Energy limited.	
5	Whether original or extension	Original	
6	If extension of lease, please clarify if proposal involves additional forest	Not applicable	
7	Date of Stage I forest clearance	F No.8-89/98-FC (Vol) dt.13.08.2014 of Govt. of India, MoEF & Climate Change (Forest Conservation Division) and Memo No.16306/F & E dt.05.09.2014 of Govt. of Odisha, F & E Department.	
8	Extent of CAMPA charges, headwise		
(a)	Compensatory Afforestation	Rs.10,89,675/-	Paid by Hindalco vide B.D No.216446 dt.09.11.2000 remitted in Ch No.4 dt.27.11.2000 of SBI, Sambalpur.
		Rs.3,09,618/-	Towards balance Compensatory Afforestation cost due to enhancement of wage rate vide cash order No.SBD 372185 dt.15.02.2002 remitted to Govt. treasury on 19.02.2002.
(b)	Regeneration of safety zone	Rs.4,61,937/-	Towards fencing protection & regeneration of safety zone over 5.35 ha deposited by the previous allotee i.e. Talabira Coal Mine Vide Cash Order No.SKJ 036011 dt.18.02.2003 in PNB, Sambalpur
(c)	Regeneration of 1.5 times of safety zone		
(d)	Net Present Value	Rs.26,04,160/-	Vide B.D No.128586 dt.29.06.2010 deposited by Previous allottee i.e. M/S Hindalco ltd.
(e)	Cost towards implementation of Site Specific Wildlife Conservation	Rs.2,38,00,000/-	Deposited in CAMPA funds (CAF) A/C No.CA 1585 DD No.694374 dt.18.03.2011 by the previous alottee i.e. M/S Hindalco ltd.
		Rs.19,00,000/-	Item No.14 to 18 as per approved Wildlife Conservation Plan of Talabira I Coal Mines by M/S Hindalco ltd.
		Rs.2,57,00,000/-	
(f)	Penal Compensatory Afforestation	Nil	
(g)	Penal NPV	Nil	

(h)	Cost towards Regional Wildlife Management Plan	Rs.34,06,100/-	Deposited through RTGS under Adhoc CAMPA in Union Bank of India, Sundar Nagar, New Delhi by the previous allotee i.e. M/S Hindalco ltd. as intimated vide this office Memo No.2719 dt.20.07.2013 to the address of Chief Conservator of Forests, (Diversion & Nodal Officer, F.C Act) O/o the Principal Chief Conservator of Forests, Odisha.
		Rs.39,17,015/-	Deposited by M/S GMR Chhattisgarh Energy limited in Union Bank of India, Sundar Nagar, New Delhi vide UTR No.NEFT/TB/AXISB 152731369262 dt.30.09.2015.
(i)	Bird Nets for Avi fauna	Rs.6,85,000/-	Towards creation and Maintenance alternate habitat/home for Avi fauna in support of which the scheme has been approved by the Regional Chief Conservator of Forests, Sambalpur. The said amount has been paid by M/S GMR Chhattisgarh Energy limited under Adhoc CAMPA in Union Bank of India, Sundar Nagar through RTGS vide UTR No.BRN-NEFT-AXISF 16013025903/Orissa CAMPA-NEFT dt.13.01.2016.
(j)	Any other	Rs.1,00,000/-	Towards lease transfer charges in Union Bank of India, Sundar Nagar New Delhi vide BRN-NEFT-AXISF 5161020376 dt.10.06.2015. This has a reference to Memo No.2352 dt.10.06.2015 to Addl. Principal Chief Conservator of Forests, (Forest Diversion & Nodal Officer, FC Act) O/o the Principal Chief Conservator of Forests, Odisha.
		Rs.3,38,400/-	Towards royalty of trees in Adhoc CAMPA Union Bank of India, Sundar Nagar, New Delhi vide BRN-NEFT-AXISF 15348071382 dt.14.12.2015.
		Rs.8,368/-	Towards royalty of 5 Nos of trees in Adhoc CAMPA Union Bank of India, Sundar Nagar, New Delhi vide BRN-NEFT-AXISF 15320094549 dt.16.11.2015.
		Rs.4,46,768/-	
9	Details of Bank Drafts (Bank Draft No, Date and Amount) headwise against items indicated in paragraph & above.		

		Sl No	D.D No.	Date	Amount (in Rs)	Head
		1	No.21644 dt.09.11.2000 remitted through Ch No.4 dt.27.11.2000	27.11.2000	Rs.10,89,675/-	8782-Cash remittance, Sambalpur Division
		2	Cash order No.SBD 372185 remitted through Ch No.09 dt.19.02.2002.	19.02.2002	Rs.3,09,618/-	8782-Cash remittance, Sambalpur Division

		3	Cash order No.SKJ 036011 dt.18.02.2003 in PNB, Sambalpur Remitted through Ch No.03 dt.21.02.2003	21.02.2003	Rs.4,61,937/-	8782-Cash remittance, Sambalpur Division
		4	B.D No.128586 dt.29.06.2010	29.06.2010	Rs.26,04,160/-	Deposited in favour CA 1585 in Corporation Bank, Lodhi Road, New Delhi.
		5	D.D No.694374	18.03.2011	Rs.2,38,00,000 /- Rs.19,00,000/-	Deposited in favour CA 1585 in Corporation Bank, Lodhi Road, New Delhi Supply of vehicle, computer with accessiories GPS, Salary of one Driver, Fuel of the vehicle.
10	Whether deposited by RTGS if so, the particulars & date of remitted	Sl No	RTGS	Date	Amount (in Rs)	Head
		1	Union Bank of India, Sundar Nagar, New Delhi A/C No. 344902010105428	26.12.2012	Rs.34,06,100/-	RTGS, Orissa CAMPA Deposited by Hindalco
		2	BRN-NEFT-AXISF 15348071382	14.12.2015	Rs.39,17,015/-	NEFT Orissa CAMPA Deposited by GMR Chhattisgarh Energy ltd.
		3	BRN-NEFT-AXISF 1601302593	13.01.2016	Rs.6,85,000/-	Orissa CAMPA Deposited by GMR Chhattisgarh Energy ltd.

		4	BRN-NEFT-AXISF 5161020376	10.06.2015	Rs.1,00,000/-	Orissa CAMPA Deposited by GMR Chhattisgarh Energy ltd.
		5	BRN-NEFT AXISF 15348071382	14.12.2015	Rs.3,38,400/-	Orissa CAMPA Deposited by GMR Chhattisgarh Energy ltd.
		6	BRN-NEFT AXISF 15320094549	16.11.2015	Rs.8.368/-	Orissa CAMPA Deposited by GMR Chhattisg Energy ltd.
11	Bank/Corporation Bank, Lodhi Complex/Union Bank of India, Sundar Nagar/ in which deposited with date of deposition		Details mentioned against Sl No.10			
12	Any other remarks		Nil			

Divisional Forest Officer
Sambalpur Forest Division

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE)
& CHIEF WILDLIFE WARDEN, ODISHA, BDA APARTMENT, 5TH FLOOR,
PRAKRUTI BHAWAN, NILAKANTHA NAGAR, BHUBANESWAR-12
Ph. No.0674-2564587, FAX No.0674-2565062
(Website:odishawildlife.org, E. mail: odishawildlife@gmail.com)

Memo No. 3127 /1 WL-SSP-324/2016
Dated, Bhubaneswar, the 22 Apr, 2016

To

The Principal Chief Conservator of Forests, Odisha,
Bhubaneswar

Sub: ***Transfer of lease in respect of diversion of 49.62 ha. (4.16 ha + 45.46 ha; Stage-I for 4.16 ha accorded on 13.8.2014 and final approval for 45.46 ha was accorded on 16.5.2002) of forest land for coal mining at Talabira-I Coal Block in Sambalpur district in the State of Odisha from the Original user i.e, M/s HINDALCO in whose favour forest land was diverted to new user agency i.e, M/s GMR Chhattishgarh Energy Limited in whose favour the coal block was auctioned/re-allotted by the Ministry of Coal- regarding***

- Transfer of approval of Site Specific Wildlife Conservation Plan from the Original user M/s Hindalco Industries Ltd. to new user agency M/s GMR Chhattisgarh Energy Ltd.

I would like to send herewith the copies of the Site Specific Wildlife Conservation Plan for Talabira-I coal block of M/s GMR Chhattisgarh Energy Ltd. in Sambalpur District in duplicate duly approved by the undersigned with financial forecast of **₹257.00 lakh** (Rupees two crore fifty-seven lakh) only for the following activities.

a.	For activities to be implemented by the user agency in project area	₹33.00 lakh
b.	For activities to be implemented by DFO, Sambalpur Division in project impact area	₹224.00 lakh
	Grand Total:	**₹257.00 lakh**

Encl: 2 copies of approved site specific WL Conservation Plan

21/4/16

Principal Chief Conservator of Forests (WL)
& Chief Wildlife Warden, Odisha

P.T.O.

(4)

Memo No. 3128 /date 22-04-2016

Copy forwarded for information and necessary action to –

1. Special Secretary to Govt. of Odisha, F&E Deptt., Bhubaneswar with reference to that Deptt. memo No.10F(Con)48/2014-8933/F&E dt 27.5.2015
2. Regional Chief Conservator of Forests, Sambalpur Circle with reference to his memo No.293 dt 28.1.2016
3. Divisional Forest Officer, Sambalpur Division with reference to memo No.295 dt 28.1.2016 of RCCF, Sambalpur alongwith a copy of the approved site specific wildlife conservation plan
4. Director, GMR Chhattisgarh Energy Ltd., New Shakthi Bhavan, Building No.302, Opposite Terminal 3, IGI Airport, New Delhi-110037 alongwith a copy of the approved site specific wildlife conservation plan

Principal Chief Conservator of Forests (WL)
& Chief Wildlife Warden, Odisha

SITE SPECIFIC
WILDLIFE CONSERVATION PLAN FOR
TALABIRA #1 COAL MINE OF
M/S GMR CHHATISGARH ENERGY LTD
AT KHINDA VILLAGE OF SAMBALPUR

Prepared By:
Sri S.K. Mishra , IFS (Retd)
Former Wildlife Warden
O/o The Chief Wild Life Warden, Odisha
Bhubaneswar (Odisha)

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PREFACE

PREFACE

Sri S.K.Mishra, IFS (Retd)
Former Wildlife Warden
O/o The Chief Wildlife Warden, Orissa
Bhubaneswar

Talabira Coal Mines-I is located in Sambalpur District, and Sambalpur South Forest Division in Orissa. This lease is spread over an area of 170.305 Ha. In the adjoining area in the Ib valley, a number of coal mines are in operation. Ministry of Coal, Govt. of India have allocated this block to M/s GMR Chhattisgarh Energy Ltd. as a source for supply of coal to IPP 2 x 685 MW to meet the power requirement. This project is located at Village – Raikheda, Dist. Raipur, Chhattisgarh.

This coal mine is situated at a close proximity to the proposed Sambalpur Elephant Reserve. Government of Orissa had proposed for expansion of the elephant reserve during 2002 but later on, realizing the existence of a number of mines and industries in the area probably did not notify the same as yet and withdrawn the said proposal. Due to close proximity of the said Talabira coal mine to the proposed Sambalpur Elephant Reserve it has been undertaken a wildlife conservation plan in order to protect the said elephant reserve. By this approach, there shall be some improvement in the situation to the advantage of the wildlife habitat. This plan aims at contributing to this cause in a modest way. This sitespecific plan, if implemented in letter and spirit, is hoped to provide some respite to all forms of wildlife and its habitat from the adverse impact of intensive activities of mining operation. For smaller wildlife animals like deer, boar, civets, hares, jungle cat, pangolin and many birds, the intervention shall definitely lead to habitat recovery and optimal population turn over.

I thank Sri Subash Chandra Sahu, I.F.S., D.F.O., Sambalpur (South) Division; and Sri A.K. Behera, R.O., Rengali for their valuable suggestions rendered for preparation of this Plan. I also thank Sri Rabindra Misra, Joint President & Sri V. Srinivasan, Head - Hirakud Complex of M/s GMR C E Ltd , Hirakud Complex for providing all logistic support for field visit and collection of data for preparation of this Plan.

I also thank Sri S.K.Mohanty, O.F.S (Retd.), Former Asst. Nodal Officer, Orissa for his contribution for preparation of this Plan. I am thankful to Sri Bira Kishore Das who has taken all pain in typing of this Plan.

S. K. Mishra

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

1.1 Talabira-I Coal block, located in Khinda-village of Sambalpur District was granted to M/s GMR Chhattisgarh Energy Ltd by Government of India for its own consumption necessary statutory clearances vide vested order of Ministry of Coal vide order No. 104/2/2015/NA dated 23rd March 2015.

1.2 The coal mine is located in Rengali Range of Sambalpur (South) Forest Division.

1.3 The mining plan for the coal mine was approved by the Ministry of Coal vide their letter No.13016/11/96-CA Dt.13.01.1999 for production of 0.4 MTPA. Based on the mining plan, M/s GMR Chhattisgarh Energy Ltd had applied to MoEF and obtained Environmental Clearance for 3.0 MTPA. Vide Ministry's letter No.J-11015/58/2009-IA-II(M) Dated 16th April 2015.

1.4 Talabira-I has also obtained valid, consent to operate for 3.0 MTPA under both - Air & Water Act from SPCB, Orissa valid upto 31.03.2016. A Copy of the same is enclosed.

1.5 Coal from this mine is supplied to its_IPP at Raikheda Dist. Raipur operating at-2x685 MW capacity,

1.6 The coal mine falls in tropics 21° 43' 45" and consequently, has tropical dry deciduous vegetation accompanied with associated wild fauna. The mine area does not form part of any National Park, Wildlife Sanctuary, Biosphere Reserve, Elephant Reserve, Elephant Corridor, Tiger Reserve nor any of these sensitive areas fall in the Buffer Zone of the study area. The expansion of Sambalpur Elephant Reserve was proposed by the State Government but later on has been withdrawn, Vide Government of Orissa Memo No : 11994 dated 26th July, 2007.

1.7 This is an open cast mechanized mine and coal transportation is done by road. Shovel dumper combination with CSM and Ripper Dozer is used for mining. It is pertinent to mention that no drilling or blasting is involved in the mining operations of this mine. The annual production target is 1.5 Million tonnes.

1.8 The mining and transport activities, cause impacts, mostly adverse, on the physical and biological ingredients of environment. It cause generation of dust, noise, smoke, fire and loss of forests. Secondary impacts go to fauna of the area, water and soil losses etc.

1.9 In order to minimize the likely adverse impact on the environment, it is necessary to take steps so that the adverse impacts are mitigated or their effects diluted to safe limits. Generation of dust and noise, outbreak of fire, loss of forest and habitat are all to be controlled and minimized. Regeneration of degraded forest areas and wasteland are to be taken up on priority. Transport roads are to be maintained. Photo voltaic fencing and engagement of competent guards is a must. All above is discussed in this conservation plan.

2.0 The over-burden dumps on reaching their approved heights steps should be taken for biological reclamation to prevent dust pollution/soil erosion /moisture loss, which is already underway.

2.1 The Conservation Plan period is suggested for 10 years and its efficacy shall be properly monitored by Company representatives, Range Officer, Rengali, Chairman of local VSS, prominent wildlife lover of the area if any, during this period.

2.2 The total cost of the Plan is Rs.210.00 lakhs. Out of this Rs. 53.00 lakhs shall be utilized by the lessee within the lease area while the balance of Rs.138.00 lakhs shall be deposited by the lessee with the DFO, Sambalpur (South) Division for measures to be taken in the Buffer zone of the Project area. In addition, Rs.19.00 lakhs worth of infrastructure shall be provided by the lessee in shape of Vehicle, cost of running, maintenance, driver wages, Computer for office & G.P.S (Ref. Chapter-6, Sec.6.3.1).

Chapter - I
Introduction

CHAPTER-I
INTRODUCTION

1.0. **Bacic ground of the lease:** The Ministry of Coal, Govt. of India have allowed Talabira-1. Coal Block in Ib Valley Coalfields in Sambalpur District for development by M/s. GMR Chhattigarh Energy Ltd as a captive source for supply of Coal to the proposed expansion of thermal Power Plant at Raikheda, Dist. Raipur Currently, exploration for coal in the lease area is being carried out with promising results. This was initiated in view of assessing the total coal reserves of all seams in the interest of coal conservation, a valuable National asset. Under above circumstances the lease area will be modified on completion of exploration to the extent of allotted Block boundary.

1.1.0 M/s GMR C E Ltd had applied to the State Govt. in Dept. of Steel & Mines for Mining lease over 170.31 ha (out of 250 ha of block area). This 170.31 ha includes 50.01 ha of forest land of Gramya Jungle and Patra Jungle category in revenue records. This lease area was granted by Govt. of Orissa in Dept. of Steel & Mines vide Proceeding No.III(D)SM-4/99. 4238/SM Dt.23.04.2003 for 30 years.

1.2.0 The entire lease area of 170.31 ha comprises of 39.85 ha of non-forest Government land, 80.45 ha of tenanted land and the rest 50.01 ha of Revenue Forest Land.

1.3.0 **Geological Reserve:** The geological reserve of the mining lease has been assessed to be 22.52 million ton in Rampur group of seams. At present exploration is on going for all the seams including lower Ib seams. The results are encouraging and reserves are likely to increase substantially. Thus the mine life will increase at least beyond next 20 years.

1.4.0 **Location of the lease:** The mine is located in Topo Sheet No.64 0/14 and bounded by latitude 21° 42' 50" to 21° 44' 37" East and longitude 83° 58' 51" to 84° 00' 39" North.

1.5.0 **Details of forest land involved:** The forest land over 50.01 ha comprises of ten plots in Rakhit Khata No.145 in 'Gramya Jungle' category and one plot under 'Patra Jungle' of village-Khinda in Rengali tahasil of Sambalpur District. The status of both these categories of forest land is revenue forests.

1.6.0 **Forest diversion proposal:** M/s GMR Chhattisgarh Energy Ltd had applied to MoEF for diversion of 45.46 ha of forest land in first phase. MoEF in their letter No.8-89/1998-FC Dt.11.05.2015 has granted diversion of forest land involved in the lease. After completion of exploration and preparation of mining plan, further diversion of forest land will be applied for in the total block area.

1.7.0 **Environment Management:** M/s GMR Chhattisgarh Energy Ltd has carried out a rapid environmental assessment of the mine and prepare environmental management plan. This plan proposes mitigating measures to minimize air pollution, water pollution, soil stabilization and conservation, afforestation and proper resettlement and rehabilitation along with disaster management.

1.8.0 **Possible impacts due to mining:** Different types of impacts are anticipated due to the mining process both within the project areas as well as the buffer zone of 10 Kms in radius around the coal block. Measures are required to be taken to minimize/mitigate these impacts. Due to commencement of mining, vehicular traffic, dust pollution, noise pollution, anthropogenic pressure on forest, degradation of forest land are some of the adverse impacts which will felt. However, coal mining has improved the living conditions of the economically backward locals due to Company's proactive R&R policies and the continuing CSR efforts.

1.9.0 **Conclusion:** In view of this fact that flora/fauna cover part of project area as well as buffer area, MOEF asked M/S GMR Chhattisgarh Energy Ltd to submit a Wildlife conservation plan, hence this report.

Chapter - II
General Description of the study area

CHAPTER – II
GENERAL DESCRIPTION OF THE STUDY AREA

2.1.0 **Location of the lease:** Talabira-I Coal Block is located in the south-eastern end of Ib valley in Rengali tahasil of Sambalpur District. The block is located at a distance of about 3.5 Kms to the west of Rourkela-Sambalpur State Highway No.10. The nearest township is Jharsuguda located at a distance of 15 Kms by road. The nearest railway station is located at Lapanga at a distance of 09 Kms. This Coal Block is connected to the highway by a road developed by the State Govt.

2.2.0 Within the Buffer zone (Area 10 km around leasehold) seven number of medium and large sponge iron/steel plants are under construction/ operation and two nos. of coal based thermal plants are coming up (**Annexure : VI**).

2.3.0 **Climate:** This area falls under tropical climatic zone. In summer the temperature rises up to 45^0 C and in winter it dips below 10^0 C. The monsoon generally arrives in June of every year and the average rainfall for the last 5 years is recorded as 1155 mm. Relative humidity varies from 21% to 87%.

2.4.0 **Physiography:** The lease area comprises of a small hillock (Borre Dungri) and surrounded by flat area with sparse vegetation.

2.5.0 **Land-use pattern in Buffer zone:** The land use pattern in the Buffer zone shows that about 54% is farming land, 14.5% covered by lakes, ponds and Hirakud reservoir, 12% wet land, 15% forest land and rest 4.5% is occupied by human settlement. Besides, there are seven numbers of large to medium scale sponge iron/ steel plants that are at various stages of construction/ operation and two nos. of coal based power plants.

2.6.0 **Water bodies:** Hirakud Dam is located about 30 Kms away from the Project site. However, during the highest flood level, the water of Hirakud reservoir enters the lease area; Therefore, a bund of three meters above the HFL has been constructed along the mining lease area towards the reservoir to avoid water ingress. The river Bheden flows at about 2.1 Kms from the site in the north which joins river IB leading to Hirakud reservoir.

2.7.0 **Drainage:** In the buffer zone there are few streams which are seasonal. The ground water table is about 8 to 10 meters. During mining operation, a main sump pit has been made within the mining lease area for storage of rain water. This pit needs to be maintained for water availability. The volume of this sump is 95,000 m^3 which is designed to ensure adequate quantity of water storage for use during lean period.

2.8.0 **Reserve of the Coal Deposit:** This Coal block has 8 seams viz. Rampur top, Rampur Bottom IV Rampur Bottom III, Rampur Bottom II, Rampur Bottom I, Ib Top, Ib_Middle and Ib Bottom. It has a proved geological reserve of 22.56 million tons of Coal from Rampur Top to Rampur Bottom I seams. The mining plan was formulated and approved for these reserves up to Rampur Bottom I. The Recoverable reserves are 15.19 million ton. The striping ratio is 1.21. In view of Ib seam existing below the Rampur group, exploration is going on for these lower seams. Once the geological report will be ready, a modified mining plan for this coal block will be prepared and mine life will get considerably extended.

2.8.1 **Mining Plan approval:** The mine has a Mining Plan approved by the Ministry of Coal vide letter No.13016/11/96-CA Dt.13.01.1999 for production of 0.4 MTPA. Subsequently, Ministry of Coal in their approval letter Dt.14.07.2006 approved the modified Mining Plan for an enhanced rated capacity of 1.5 MTPA based on 22.56 million tons reserves (**Annexure : I**).

2.9.0 **Environmental clearance:** State Pollution Control Board, Orissa in their Consent letter No.12907-SPCB/BBSR-1-I-IND

(CON) 2707 Dt.25.05.2007 has granted consent to operate for 0.4 MTPA, valid for 5 years up to 31.03.2011 (**Annexure: IV**).

2.10.0 **Population:** The population density is 102 persons per sq Km. The Scheduled Caste population is 16.66% whereas S.T. is 14.09 %. The main occupation of local people is agriculture, fishing and country cigarette (Bidi) making; Literacy percentage is 16.03% as against 33.13% of Sambalpur District, 40.97% in the State and 65.18% in national level. Villagers use coal as their main source of fuel, due to easy access.

2.11.0 **Forest and Forest types**: The project area does not come under reserved forests but revenue forests classified as Gramya Jungle cover part of project area. There are eight reserved forests falling partly within buffer zone. These are :

Sector	Name of Forest Block	Remarks
NE Sector	Kurebaga R.F.	A small patch of these RF entering buffer zone near its boundary
	Katikela R.F.	
	Ghichamura R.F.	
SW Sector	Maulabhanja R.F.	The RF is separated by an elongated stretch of water body of Hirakud reservoir from core zone.
NW Sector	Patrapali R.F.	All these RF are located west of Bhedan river
	Malda R.F.	
	Rampur R.F.	
	Khait R.F.	

Salia Bamboo (Dendrocalamus Strictus) is sporadically present in highly degraded state. Undergrowth is scant to moderately present. Sheet and gully erosion is common along nalas and sloppy areas.

The area has been characteristically dry deciduous forest with pre-dominance of coppice shoots of Sal. According to Champian & Seth, the forest of this area can be classified as 5B/C2. The species commonly seen in the area as revealed from field visit are furnished below.

TREES

Local Name	*Botanical Name*	Family Name
Achu	*Morinda tinctoria*	Rubiaceae
Amla	*Emblica officinalis*	Euphorbiaceae
Ankula	*Alangium lamarkii*	Cornaceae
Asan	*Terminalia alata*	Combretaceae
Bahada	*Terminalia belerica*	Combretaceae
Bara bakulia	*Dalbergia paniculata*	Pailanaceae
Barakoli	*Zizyphus mauritiana*	Rhamnaceae
Baruna	*Crataeva religios*	Capparideceae
Bel	*Aegle marmelos*	Rutaceae
Bana Bhalia	*Semicarpus anacardium*	Anacardiaceae
Behenta	*Lemonia acidissima*	Rutaceae
Bheru	*Chloroxylon swietenia*	Meliaceae
Char	*Buchnania lanzan*	Anacardiaceae
Chhatian	*Alstonia scholaris*	Apocynaceae
Dhaman	*Grewia tiliaefolia*	Tiliaceae
Dhaura	*Anogeissus latifolia*	Combretaceae
Dimiri	*Ficus glomerata*	Moraceae
Haldu	*Adina cordifolia*	Rubaceae
Harida	*Terminalia chebula*	Combretaceae
Jamun	*Syzygium cuminii*	Myrtaceae
Kalucha	*Glochidion lanceolarium*	Euphorbiaceae
Karada	*Cleistanthus collinus*	Euphorbiaceae
Katrang	*Gardenia latifolia*	Rubiaceae
Kendu	*Diospyrus melanoxylon*	Ebenaceae
Kochila	*Strychnos nux-vomica*	Loganiaceae
Kumbhi	*Careya arborea*	Myrtaceae
Kusum	*Schleichera oleosa*	Sapindaceae
Sal	*Shorea robusta*	Dipterocarpaceae
Sidha	*Lagerstroemia parviflora*	Lythraceae
Semul	*Bombax ceiba*	Bombacaceae
Siris	*Albizzia lebbek*	Mimosaceae
Sunari	*Cassia fistula*	Ceasalpiniaceae

GRASSES

Scientific Name	Family Name
Imperata cylindrical	Poaceae
Thysanolaena maxima	Poaceae
Apluda mutica	Poaceae
Aristida setacea	Poaceae
Heteropogon contortus	Poaceae
Cynondon dactylon	*Poaceae*
Bothriochloa bladhii	*Poaceae*
Lipocarpha sphacelata	*Poaceae*
Eragrostis japonica	*Poaceae*
Sacchrum spontaneum	*Poaceae*
Themeda triandra	*Poaceae*
Arundinella khasiana	Poaceae

SHRUBS / HERBS

Local Name	*Species Name*	Family Name
Anantamula	*Hemidesmus indicus*	Asclepidaceae
Arakha	*Calotropis gigantia*	Asclepidaceae
Basanga	*Adhatoda vasica*	Acanthaceae
Dhatki	*Woodfordia fruticosa*	Lythraceae
Kurei	*Holarrhena antidysenterica*	Apocynaceae

CLIMBERS

Local Name	*Species Name*	Family Name
Akanbindhi	*Cissampelos pareira*	*Menispermaceae*
Atundi	*Combretum decandrum*	*Combretaceae*
Baidanka	*Mucuna monosperma*	*Papilonaceae*
Bichhuati	*Urtica dioica*	*Euphorbiaceae*
Mututri	*Smilax macrophylla*	Liliaceae
Siali	*Bauhinia vahlii*	Papilonaceae
Satabari	*Asparagus racemosus*	Liliaceae

The trees, shrubs, herbs and climbers found in the project site are also commonly found in other areas of Orissa ans adjacent areas of the project site.

2.12.0 **FAUNA**

The project area does not form part of any National Park, Wildlife Sanctuary, Biosphere Reserve, Tiger Reserve or Ramsar site. No elephant corridor comes within the project area. The fauna noticed in buffer zone are furnished below. This has been collected from droppings, foot prints, interaction with local people, forest officers and site visit.

Local Name	Zoological Name	Schedule
MAMMALS		
Elephant	*Elephas maximus*	I
Rufous Tailed Hare	*Lepus Nigricallis huficaudatus*	IV
Rhesus monkey	*Macaca mullata*	II
Langur	*Presbytes entellius*	II
Jackal	*Canis aureus*	II
Civet	*Viverricula indica*	II
Mongoose	*Herpestes edwardsi*	II
Hyena	*Hyaena hyaena*	III
Jungle Cat	*Felis chous*	II
Wild Boar	*Sus scrofa*	III
Barking deer	*Muntiacus muntjak*	III
Spotted Deer	*Axix axis*	III

Local Name	Zoological Name	Schedule
Porcupine	*Hystrix indica*	IV
Pangolin	*Manis crassicaudata*	I
Sloth Bear	*Melursus ursinus*	I
BIRDS		
Pond heron	*Ardeola grayii*	IV
Cattle egret	*Bubulcus ibis*	IV
Open bill stork	*Anastomus oscitans*	IV
Red Jungle fowl	*Gallus gallus*	IV
Jacana	*Metopidius indicus*	IV
Ring Dove	*Streptopelia decaocto*	IV
Spotted Dove	*Streptopelia chinensis*	IV
Large Indian Parakeet	*Psittacula eupatria*	IV
Rose ringed Parakeet	*Psittacula krameri*	IV
Cuckoo	*Cuculus canorus*	IV
Crow pheasant	*Centropus sinenesis*	IV
King fisher	*Alcedo attahis*	IV
Wood pecker	*Picus myromecophoneus*	IV
Drongo	*Dicrurus caerulescens*	IV
Bul Bul	*Pycnonotus jocosus*	IV
REPTILES		
Rock gecko	*Hemidactylus maculates*	
Chamelon	*Chamaelco zeylanicus*	II
Checkered Keel Back	*Enhydris enhydris*	II
Rat Snake	*Ptyas mucosus*	II
Banded krait	*Bungarus caeruleus*	III
Cobra	*Naj naja*	II
Bengal Monitor	*Varanus bengalensis*	I
AMPHIBIANS		
Indian toad	*Bufo melanostictus*	
FISHES		
Chital	*Notopterus chital*	
Dandakiri	*Esomus danricus*	
Mohurali	*Rasbora daniconius*	
Bhakura	*Catla catla*	

Local Name	Zoological Name	Schedule
Rohi	*Labeo rohita*	
Kantia	*Mystus cavasius*	
Balia	*Wallago atu*	
Gadisa	*Channa punctatus*	

These animals are commonly found in other parts of Orissa also.

2.13.0 **Working Plan Prescription:** The forest areas in and around the project area as well as in Buffer zone has been allotted to Rehabilitation Working Circle (Page 351 of Working Plan). The special objects of management is:

- To cut the useless thorny bushes and weed growth to favour the growth of principal and secondary species.
- To encourage the natural regeneration through fire protection, minimizing grazing and tree felling by involving local communities.
- To enrich the micro-edaphic conditions and ensure maximum conservation of soil and water through proper soil & water conservation measures and by involvement of local people.
- To supplement the existing forest growth by planting the indigenous species in the gaps.
- To boost up growth of Sal and other valuable species of coppice origin by appropriate cultural operation.
- To provide adequate protection to the area having rooted waste against biotic interference.
- To meet the bonafied needs of the local people like firewood, small timber, NTFP etc. through their local management committees.

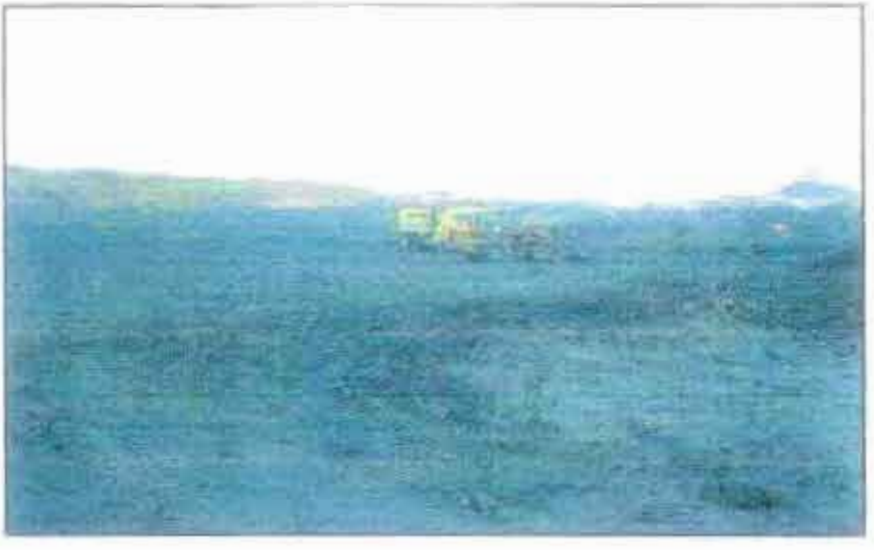
2.14.0 **Land use pattern of the M.L. area :**

The land-use pattern of this mine is as follows:

1.	Non-forest Govt. Land	:	39.85 ha
2.	Tenanted land	:	80.45 ha
3.	Revenue forest land	:	50.01 ha
	Total	:	**170.31 ha**

CHAPTER – III
MINING PROCESS

3.1.1 **General:** The Recoverable reserves of Talabira I coal block is 15.19 Million tons for all five seams of Rampur group put together. The annual production target has been fixed at 1.5 Mty. The current exploration for Rampur Bottom and Ib seams is yielding promising results and the life of mine is likely to further increase by 20 more years beyond the earlier estimated 11 years.



3.1.2 **Deposit characteristics:** Eight coal seams viz. Rampur top, Rampur Bottom IV Rampur Bottom III, Rampur Bottom II, Rampur Bottom I, Ib Top, Ib Middle and Ib Bottom.are present in Talabira Block- I. Rampur group seams are being worked by opencast method. The block is a small sub basin separated by a N-S trending patch of metamorphics from Talabira II block.

3.1.3 **Reserve and stripping ratio:** The total geological reserve of the mine is 22.56 million ton of Coal from Rampur group of seams. Reserves of Ib seam and its splits have not been considered. The Recoverable reserves in Rampur group seams are 15.19 million ton. The striping ratio of the mine is 1.21.

3.1.4 **Mining System:** The present mining operations are being carried out by ripping overburden by ripper dozers and coal mining through continuous surface miner (CSM). There are certain restrictions of mining operations because of proximity to Hirakud Reservoir. According to stipulation of MoEF no drilling and blasting shall be resorted within this mine. Hence the following combinations is being practised:

- Continuous Surface Miner for Coal & Ripper for overburden.

3.1.5 **Excavation:**

Top soil is proposed to be removed and stacked either in temporary storage areas or directly transported to the backfilled and leveled areas for reclamation. The OB is cut Ripper Dozer. Then it is handled by shovel – dumper combination. Coal is cut by Continuous Surface Miner (CSM) and transported by FE loader – trucks combination.

Coal winning by Surface Miner

Soil and OB removal by Ripper Dozer

3.1.6 **Transport:**

It is proposed to deploy 9-14 M^3 rear dumper in conjunction with 5 cum rope shovel and hydraulic shovels. Transport route for overburden will be along the working flank roads to internal dumps. As proposed feeder breakers would be established within the quarry for crushing coal, limiting coal transportation from working faces to feeder breakers. 35t rear dumper with steel body is proposed to be deployed for

this purpose. Finally the coal is transported to CPP at Hirakud by road.

3.1.7 **Pumping and Drainage:**

The planning for dewatering the mine has been done in such a way that the working places and haul roads would remain dry as far as possible. The quantity of water inflow to the excavated area during a day of peak rainfall in monsoon season would be pumped out within 3 days by a group of larger capacity pumps and head pumps would be pressed into dewatering service during dry seasons. Water stagnated on haul roads, near the working faces, etc. would be handled by face pumps. During rainfall, the water inflow into the sump would contain silt and clay. Special type of slurry pumps have been provided to deal with such situation.

Storm water on active mine site collected in mine pits

3.1.8 **Project at a glance:**

The salient features of the mining operation is giving in the following table:

Sl. No	Item	Description
1.	Name of mining plan	Revised Mine Plan of Talabira-I OCP for 1.5 Million Tonnes
2.	Scope of Mining Plan	Mining Plan existing Talabira-I mine and increasing its capacity to 1.5 Million Tonnes
3.	Coalfield	Ib Valley Coalfield
4.	Location	Village Khinda, Thana and Taluka Katarbhanga Tehsil Rengali District Sambalpur
5.	Company	GMR Chhaattisgarh Energy Ltd
6.	Total Geological Reserves of the Leasehold area	22.56 Million Tonnes. a) Mineable Reserves: 17.25 tonnes b) Recoverable reserves: 15.19 M. Tonnes. c) Coal Grade: F
7.	Area of Mining Sector	170.305 Ha
8.	Total O.B. Stripping Ratio	12.60 0.83 M^3/1 Tonne of O.B.
9.	Manpower/OMS (300 days 2 shifts)	(Manpower = 250) 21.33 Tonnes
10.	Average Grade of Coal	Grade "F"
11.	Method of Mining	Opencast, O.B. by Ripper Dozer, Coal by continuous Surface Miner, Loading by FLE & Backhoes. Transport by Rear Dump trucks
12.	Annual out put	1.5 Million Tonnes
13.	Life of mine	11 years, expected to increase further.

3.1.11 **Equipments to be deployed:**

The list of equipments to be deployed in Talabira Coal Mine is given in the following table:

Deployment	Equipment	Capacity	Number
Overburden	Excavator	$3M^3/0.9M^3$ Bucket	2
	Rear Dump Trucks	$14M^3$	3
	Rear Dump Trucks	$10/9M^3$	2
	Ripper Dozer	D-457 A3 (770HP)	2
Coal Production	Continuous Surface Miner	2m+0.2m Attachment	1
	Wheel Front End Loader	$3M^3$ Bucket	2
	Rear Dump Trucks	$6.5M^3$	10
Auxiliary Equipment	Drill Machine	100mm	1
	Dozer	$65M^3/35M^3$	2
Support Equipment	Water Sprinkler	8 K.L. & 12 K.L.	2
	Diesel Browser	8 K.L.	1
	Service Van	1612/407 Tat	2
	Utility Van	Bolero	1
	Ambulance	Omni Van Type	1
	Fire Tender	4 K.L.	1
	Pumps	52 HP	2
		26 HP	2
	Geophysical Logger	150m	1

Chapter - IV
Impacts on Flora & Fauna due to Mining

CHAPTER – IV
IMPACTS ON FLORA & FAUNA DUE TO MINING

4.0.1 **General:**

The project area partly covers forest land which is of village forest category and form part of quarry area and the rest is private land and non-forest government land. The topography of the area is flat to moderately undulating. With the existing mine mechanized system, the opencast mining will continue.

4.0.2 As this is an existing mine, normal mining activities are expected to continue in the area which will result in modification of landscape. Changes brought about in the landscape, due to mining will be reclaimed as per the approved Environmental Management Plan.

4.0.3 As the forest within lease area and in near vicinity is already degraded, presence of wild animals is minimal. Small ground dwelling animals like hare, porcupine and birds like grey patridge, jungle bush quall, stone curlew, red vented bulbul, red wattled lapwing, common babbler etc. are there.

4.0.4 Forest within 10 km i.e. in buffer zone of Talabira Coal Block have 8 R.F.s. The ground is undulating with low hillocks with the exception of Maulabhanja R.F. having steep hills. The impact of mining on Maulabhanja R.F is expected to be minimal as the area is clearly separated from the core zone by 2 to 3 km wide tract of water body of Hirakud reservoir. Maulabhanja R.F. has partly bigger trees and rest are all degraded with tree growth 3 - 5 m high. A small family group of elephants make use of Katikela, Malda and Ghichamura R.F.s, more frequently during the paddy crop season.

4.1.0 **Anticipated Impacts:**

Some anticipated impacts are indicated below for addressing the same effectively, to the extent possible in the subsequent chapters.

4.1.1 Dust:

All mining activities like excavation, dumping, transportation etc shall generate lot of dust including coal dust. This will cover the leaf surface and affect photosynthesis, of plants within 1 km of the quarry area including CHP area.

4.1.2 Noise:

Movement and operation of heavy machineries and of transport vehicles shall generate some noise. It may be noted that no blasting is being done in this mine which will result in considerably less noise pollution as compared to other coal mines.

4.1.3 Lighting :

The fixed lights in the mine and head lights of vehicles will illuminate forest patches and likely to disturb their active and rest phase.

4.1.4 Accidents:

As the mine pits are quite steep and deep, accidentally, animals may fall in the pit while moving during night.

4.1.5 Over dependence of people on forest :

The weaker section of people of the buffer zone are dependent on the forests for their livelihood requirements. As the mining process is mechanized, there is little prospect of their engagement. Consequently, forests gradually get depleted to the detriment of wild animals.

4.1.6 Loss of forest:

Clearing for roads, power lines, colonies, shops and encroachment etc. may reduce the existing forest in the area, if remedial measures are not taken. This will lead to loss of shelter and food resources.

4.1.7 **Forest fire:**

Due to increase in human activities, negligence etc forest fire may take place, though otherwise also, it is quite common in tropical forest. Fire in such type of deciduous forest is mostly anthropogenic in origin. This, in turn, may deprives wildlife of their cover and food.

4.1.8 **Weeds:**

Due to increased anthropogenic activities and clearance of forest cover many obnoxious weeds viz Eupatorium odoratum, Lantana camara, Pyrethrum, Aegyratum, Sida cordifolia, Papaver mexicana, Cassia tora etc. may spread, preventing rejuvenation of forage and thereby effecting the food and shelter.

4.1.9 **Smoke:**

The households and colonies, kiosks etc in a coal mine are likely to use coal as a cheap fuel for cooking or heating. This will generate a lot of smoke which will pollute the air and affect forest areas.

4.1.10 **Man-wild animal conflict:**

this is a general impact where any development is undertaken in forest area. In this mine also the conflict is likely to take place.

4.2.0 All these perceived impacts/threats needs be removed through different measures in order to improve the habitat for wildlife so that their status can be enhanced and healthy environment is created. The measures for the same have been outlined in the next chapter.

CHAPTER – V
CONSERVATION PLAN FOR MANAGEMENT OF WILDLIFE

5.0.0 Considering the anticipated impacts/threats posed by Talabira-I Open Cast Mine as indicated in Chapter IV, it is necessary to take suitable ameliorative measures to see that the assessed impacts on the wildlife and its habitat, due to mining and ancillary activities is minimized. It will be necessary to manage the perceived adverse impact in such a manner that this does least possible harm despite the mining operation. The strategy of conservation measures will mean promotion of support factors like food, cover, water, tranquility, habitat contiguity (corridors for travel) etc. All habitat requirements will be properly juxtaposed within the cruising radii of wild animals. The vegetation will be maintained in optimum level of interspersion as regards density cover and stand height.

This conservation plan aims at maintenance of optimal habitats in proper stage of productivity and repair of damages already done or that may be done to the habitat through mining and ancillary activities.

Conservation of wild lands and wild life has to be participatory for sustainability. To elicit people's participation, people will be properly educated and avenues of income generated for them through increase in vegetation and insuring the safeguards in the created vegetation areas.

5.1.0 **Measures within the M.L. area :**

5.1.1 **Dust control:**

Dust generated due to face activities and due to movement of vehicles affects the wild animals and plants. This will be prevented by covering the coal during transportation and by

Chapter - V

Conservation Plan for Management of Wildlife

sprinkling of water thrice daily on haul roads to keep the roads damp. Precaution will also be taken while transporting and dumping of O.B. Sprinkling with water and wetting of coal loaded on trucks shall prevent the fugitive emission of coal dust.

5.1.2 **Noise:**

Noise due to machine operation and vehicles is likely to disturb wildlife. This would be minimized to least possible level. This would be achieved by proper maintenance of machinery and use of efficient muffling devices. The quarry area shall be encircled by green belt at least 20m thick. The transport route shall be provided by 15m wide avenue plantation on both sides if the road in the project area and road leading to State Highway.

5.1.3 **Plantation in degraded habitat :**

Safety zone and other degraded habitats within the M.L. area will be covered up with 70 ha of plantation to provide food and cover to wild animals. This will also act as dust trap, light shield and acoustic barrier. Nursery raised seedlings will be planted in 0.45 cubic meter pits with a basal dose of farm yard manure and 30 gms of NPK fertilizer. A spacement of 2.5 x 2.5 m will be used. Natural root stock will also be tended simultaneously to achieve a plant population of 2000-2500 in due course. Standard procedures of tending will be adopted.

5.1.4 **Salt licks :**

Five salt licks will be maintained within the M.L. area to meet the mineral requirements of deer.

5.1.5 **Forest protection :**

Rigid protection will be given to the natural forms and plantation for their effectiveness as shelter and shelterbelt. For this purpose, 2 Van Sahayaks will be engaged for the entire period of the plan.

5.1.6 **Moisture conservation :**

Staggered contour trenching will be done in degraded patches every 25-30 metres. Trenches will be V shaped with top width

0.6 m and depth 0.45 m in 5 m length with a gap of 3 m in between. The excavated soil will be heaped on the downward side. Check dams of boulder will be erected on nala at suitable intervals to reduce velocity of water flow during rains and prevent stream bank erosion.

5.1.7 Photo-voltaic fencing :

Photo-voltaic fencing will be installed around mining pits to prevent straying of wild animals and cattle in to the pit and get injured or killed.

5.1.8 Fire Control:

The accidental fires in the project area shall be extinguished immediately. Fire is a hazard for mining operations also. Hence in project area (core zone) no fire will be allowed to spread to any part including nearest vegetation.

5.1.9 Weed Control:

All weeds are nuisance for mining operations. They hinder growth of desirable trees in colony areas. At beginning of monsoon all young weeds, which sprout on start of rainy season, shall be uprooted and disposed. This will help growth of good trees and support the faunal population.

5.1.10 Smoke Control:

Generation of smoke adversely affects flora and fauna. As it is not being practiced in Coal Companies, no coal would be used for any domestic purposes. Even for industrial purpose, in this project, hardly any coal is to be used. No other impacts are assessed in core zone.

5.1.11 Awareness promotion:

No effort to protect wildlife and its habitat shall succeed without active involvement of mining officials and work force. Hence it is important to create awareness among them. For this purpose, lectures, observation of different functions like wildlife week, competitions like debate, essay and quiz, film show, printing and

distribution of literature can be taken up. Suggestion to better conserve wildlife will be invited and suitable reward given as encouragement to the person. Besides, visit to protected areas shall be quite useful. The youth including children should particularly be targeted for the purpose.

5.2.0 Measures for the buffer zone:

5.2.1 Dust Control:

All transport roads of the project passing through buffer zone shall be kept wet by sprinkling of water at required interval. The frequency of watering will be based on season and weather conditions. This will reduce dust and minimize the impact on flora/fauna.

Mobile Sprinklers - for effective dust suppression

Auto sprinklers for better dust control

5.2.2 Noise Control:

Major noise contribution, seriously affecting the fauna in opencast mine is blasting. In this mine NO BLASTING is envisaged. Therefore in the buffer zone there is hardly any likely impact. The silencer and other noise controlling ancillaries in transport vehicle shall be maintained at the highest level. This will minimize the impact to great extent.

5.2.3 Protection and improvement of habitat:

The patches of forest that forms the habitat of wildlife is threatened due to anthropogenic pressure generated due to the coal mining, industries and all other ancillary activities. Hence, concerted and vigorous efforts would be made to protect such forest patches. Besides, improvement of vegetation cover on non-forest land in the buffer zone shall be tried. For this purpose, the forest field unit formations shall be strengthened with support of **4 Bana Sahayaks** (preferably Retd. F.G. / Ex-Army Jawan), to be engaged with the funds placed by HINDALCO. About one hundred hectares of plantation in the degraded forest land would be done. Some waste land contiguous to forest would also form part of plantation. Two year old healthy seedlings of species like Gambhar, Gohira, Bamboo, Moi, Simili, Bara, Bela, Tentera, Dhaman, Gohira, Kumbhi, Aswatha, Jari, Sisoo (through not local) Barakoli (zizyphus), Aanla, Neem, Kala and Dhala Siris, Bankapasia and edible grasses can be planted in pits of $0.5m^3$ filled with valley soil mixed with bio fertilizer. Bio-insecticide like neem oil cake can be used for preventing pests. Along with edible species, non-edible species like Karada, Karanja, Chhatian, Sidha, Jamu, Mahul, Kusum etc. will be intermixed with edible species mentioned above in 1:2 ratios respectively. For this purpose, 50cm x 50cm x 50cm pits shall be dug for the purpose and filled with borrowed valley soil, farm yard manure and bio-insecticide like neem oil cake. Saucer shaped mounds shall be provided around plants on flat ground and half moon trenches may be provided on slopes for better moisture retention. Casualty replacement should be done with healthy seedlings during 2nd half of July in the 1st year and early July in next 2 years, if required. Weeding should be done every year up to 5 years. Clod mulching around the saplings will be done after rains during 1st, 2nd and 3rd years.

Fire should be completely prevented in the plantation through the Bana Sahayaks. Fire lines may be laid internally and surrounding the plantation, Seeds of edible grasses, legumes and berries of Themeda triandra, Heteropogon, Chrysopogon, Isielema laxum, Dendrocalamus, Albizzia, Dalbergia, Mitragyna, Zizyphus ocnoplia, Carissa, spinarum, Sterculia, Colorata, Grewia tiliaefolia etc. embedded in cow dung/ soil pellets may be broadcast in the openings after first monsoon shower, preferably after deweeding, winter control burning and hoeing.

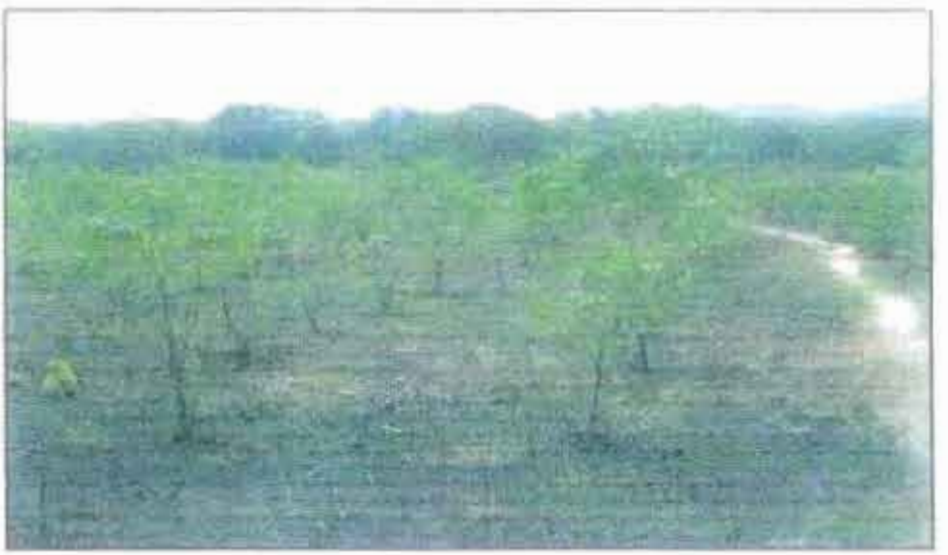
The habitat requirement of food, cover, water, interspersion and juxtaposition will be adequately met. The first three are quantitative and qualitative. The later two are the pattern of arrangement. By interspersion is meant arrangement of cover types, successional stages, browse and grass land, water bodies well distributed all over the area so that each unit of habitat within the cruising radius remains optimally productive in terms of numbers of wild animals with the limit set by the saturation point of each species while juxtaposition is maintenance/creation of all habitat requirements within the normal cruising radius of animal having the least home range and in relation to each other. While attempting habitat improvement, the above principles should be kept in view.

Unique habitats like grass land, wet wallow, riparian forests, caves, rock out crops, salt licks, snags (hollow standing and dead trees or tree having nesting holes) and talus (fallen logs), springs, water holes, climber thickets (wallowing and ambush

cover) will be enumerated, plotted on the map and well secured from the poacher.

Attempt will be made to develop multi-tier vegetation with sufficient ground cover and under growth, which really is vital for food and cover for most animals. Tree growth is essential for thermal cover and availability of the former on sustained basis.

This 100Ha will cover total forest land in the area west of Sambalpur – Jharsuguda rail and road corridor. Beside, some waste land will also get covered in this proposed area of 100 Ha.



5.2.4 **Improvement of water availability:**

The seasonal streams that dry after the monsoon can be bunded with rubble check dams at intervals of 50 to 200 meters depending on slope, so as to keep the crest of one below at a level with the bottom of one up, not only to store water for longer time, but also to improve the subsoil moisture regime and help growth of vegetation, so essential for small ground dwelling animals. This provides them food and cover.

Two game tanks of 50m x 40m x 5m may be dug at suitable points in valleys to store a minimum of 1.5 m deep water for the pinch period and to recharge ground water.

5.2.5 Salt licks:

As natural salt is very scarce in the area and salt is a very essential requirement for the wild animals particularly the herbivores, five such salt licks may be created artificially and maintained for use of wild animals near the water hole and grass land. Clay soil will be mixed with salt mixture in 3 : 1 ratio. Salt mixture will be prepared by mixing of 95 kg common salt, 3 kg rock salt and 2 kg trace mineral mixture.

5.2.6 Forest fire:

Fire is a menace for the natural vegetation of the area. Uncontrolled fire lit for collection of mohwa and other NTFP etc spreads to forest areas in hot dry months destroying forest cover, causing shortage of food, killing wild animals and burning their nests/eggs. This can be checked through fire lines (10m wide) cut and kept cleared along paths, streams, ridges, boundaries etc. Four fire watchers can be engaged for 5 months every year to prevent spreading of such fires. Villages coming within fire prone areas can be incentivised to religiously secure fire protection and take up fire fighting measures. A fire watch tower will be constructed at a suitable location to assist early detection of forest fire for organizing fire fighting.

5.2.7 Measures to reduce dependence on forest:

The local people are heavily dependant on forest and deplete the same for meeting their requirement of fuel, fodder, agricultural implements, house construction, NTFP and for sale in nearby townships. Hence alternate employment in diary, poultry, piggery, horticulture, vegetable and mushroom cultivation, handicraft, tailoring, knitting, making *agarbattis*, setting up shops and eateries and small technical jobs can be provided to those not finding suitable employment in mine or otherwise. This can be done through capacity building and linking up with financial institutions and formation of Self Help Groups. The avocation can depend on aptitude of individuals, marketing facilities and

availability of raw materials. A few youth will be trained in alternative eco-tourism activity.

5.2.8 Man-wild animal conflict:

Following measures are to be taken to minimize such conflict or to reduce its adverse impact.

5.2.8.1 Corpus fund:

A corpus fund of Rs.5.00 lakhs shall be placed with DFO, Sambalpur, South Division to pay compassionate grant in case of any damage to life or property for replenishing the same when funds are made available through budget allotment. As it is a 'corpus fund' meant to meet exigencies, this should be made available to the D.F.O. through appropriate mechanism instead of being deposited in the general pool.

5.2.8.2 Anti-depredation measures:

The VSS of the area should be trained and equipment like sealed beam heavy duty torch lights, fire crackers and sirens provided to them for driving away wild animals smoothly in case of such depredation, without injury to the animals or harm to people. They should inform the Forest Department for required support. VSS and F.D. can work in tandem in crisis management related to depredation. Community storage godown and metal bins are options which will be tried for storage of paddy beyond the reach of stray elephants.

5.2.8.3 Sensitizing people:

Bear attack is quite common particularly during mohwa season. This happens accidentally in foggy mornings when bears and gatherers converge under the mohwa trees. Hence people should be sensitized to take adequate precaution and go in small groups after dawn. Such sensitization may also be required in case of other animals also.

5.2.8.4 **Solar fencing:**

In most vulnerable areas 10 kms of 5 strand solar fencing can be provided along the forest fringes to prevent animals attacking crops. This will also prevent the likely conflicts between fauna village dwellers.

5.2.9 **Awareness promotion:**

No conservation programme shall be successful without involvement of people. For this purpose their awareness should be improved. This can be done through observation of different conservation functions like wildlife week and talks by eminent persons in the field, film shows, street plays, audio-visual aids, posters, brochures, organizing competitions like essay, debate, photography, sit and draw etc. Visit of select groups to protected areas may also help in creation of such awareness.

5.3.0 **Duration and Monitoring of the Scheme:**

5.3.1 **Plan Period:**

The plan period shall be 10 years. This can be revised thereafter based on experience gained, prevailing cost of different component of work and new methodologies evolved by then.

5.3.2 **Monitoring:**

Unless the programme is continuously monitored, the short comings can not be rectified. In order to do this a committee headed by the DFO, Sambalpur south may be formed with local BDOs, ACF, Range Officers, Chairman VSS and representative of HINDALCO. This committee should sit at least twice every year to review the progress and remove short comings. In case similar activities are taken up by line departments of the government, it should be ensured that there is no duplication, while its benefit should accrue to the community and the ecosystem.

5.3.3 **Field monitoring:**

It will be difficult to assess the result of this plan unless the status of wild animals and flora is monitored on annual basis. This can be done through experienced wildlife personnel or competent institutions and result submitted to the monitoring committee for bringing about course correction if required. This can be preferably done in dry season i.e. April or May every year.

5.3.4 **Indicators of Success:**

Following factors will be taken as measurable indicators of success of the plan.

i) Increase in forest density and horizontal cover.
ii) Increase in relative abundance of wild animals and sighting success.
iii) Reduction in depredation.
iv) Number of persons taking up alternate income generating activities.
v) Reduction in number and extent of forest fire.
vi) Overall health of the areas eco-system.

5.4. **Interventions under legal frame work:**

While implementing this plan care should be taken to see that the provisions of different national or state laws like Wildlife (Protection) Act, 1972, Orissa (Forest) Act, 1972, Forest

(Conservation) Act, 1980, Environment (Protection) Act, 1986, rules made there under and instructions of different statutory bodies like State Pollution Control Board are not violated.

5.5. Plan Cost:

The total cost of the project has been worked out be **Rs.210.00 Lakhs** according to the Chapter-VI. Out of this **Rs.53.00 Lakhs** shall be utilized by M/s. HINDALCO through its own agency within their lease area. **Rs.138.00 lakhs** shall be deposited by the lessee with the DFO, Sambalpur (South) Division for measures to be taken in the Buffer zone of the Project area. In addition, **Rs.19.00 lakhs** worth of infrastructure shall be provided by the lessee to the DFO Sambalpur (South) Division in shape of Vehicle, cost of running, maintenance, driver wages, Computer for office & G.P.S over the plan period (Ref. Chapter-6, Sec.6.3.1).

Chapter - VI
Financial Forecast

CHAPTER –VI

FINANCIAL FORECAST

6.4.0. Based on activities suggested in the Chapter-V broad financial estimate for activities within the lease hold area and in the adjoining forest etc. areas.

6.5.0 The following table indicates the cost estimate for measures to be taken inside & outside the project area within 10-years. The cost of these measures shall be deposited with the Forest Department to be utilized by the Divisional Forest Officer, Sambalpur (South) Division for execution of works as per details given below under the guidance of Conservator of Forests, Sambalpur Circle.

Sl. No.	Item of work	Estimated cost (Rs. in Lakhs)
A	**Activities to be taken up by the Divisional Forest Officer inside lease hold area.**	
1	a) Plantation preferably with fodder, bamboo, fruit bearing species Including watch and ward for 10 years. At least 70 ha. @ Rs.30,000 per ha.	21.00
2	Provision of Salt lick with maintenance	1.00
3	Moisture conservation measures and water harvesting structures along the existing nallas and water channels for 10-years	2.00
4	Photo voltaic (Solar fencing) to avoid straying of wild animals into mining area	5.00
5	Public awareness about mining and wildlife protection	3.00
6	Watch & ward for fire prevention.	1.00
B	**Activities to be taken by the Divisional Forest Officer outside the lease hold area within Buffer Zone.**	
1	a) Creation of water source by digging game tanks (4 game tanks @ Rs.6.00 Lacks each)	24.00
	b) Maintenance to game tanks (old)	10.00
	c) Provision of Salt lick /maintenance	3.00
2	a) Large scale plantation preferably with with fodder, bamboo, fruit bearing species and development of grass land Including watch and ward for 5 year, at least 150 ha. @ Rs.30,000 per ha.	45.00
	b) Deweeding, Control burning, hoeing and sowing of pelletised seeds to improve grass and browse including watch and ward in degraded area for 10-years at least 100 ha. @ 10,000 per ha.	20.00

03	2 Bana Sahayaks @ 2,500 X 4 X12 X 10	12.00
04	Moisture conservation measures and water harvesting structures along the existing nallas and water channels for 10-years	8.00
05	Public awareness / Capacity Building	4.00
06	Fire protection for 10-years including wages of fire watchers @ 2100/- per month for 5 months	6.00
07	Watch Tower 1 No. at strategic location/ near Protection camps	3.00
08	Anti-depredation squad with cost equipment, incentives etc. @ 0.60 Lakh per year.	6.00
09	Corpus fund for paying compensation at the time of exigencies on man wild animal conflict	5.00
10	Livelihood improvement and incentives to VSS	8.00
11	Alternate avocation to people not able to joining mining	8.00
12	Community Storage godowns / metal bins to save crop raid by elephant	5.00
13	Solar fencing its maintenance	20.00
14	One fast moving vehicle .	7.00
15	One Computer with accessories	0.50
16	One G.P.S.	0.20
17	Salary of one driver @ Rs.4000/- per month for 10-years.	4.80
18	Fuel for the vehicle @ 100 liters per month for 10 years and maintenance	6.50
19	Development of communication network / GIS based maps Satellite maps on GIS domain should be procured every year to know the changing profile of the project area in both dry season and wet season for 10 years preferably using the GIS lab of PCCF(WL), Orissa	10.00
20	Pollution control and monitoring mechanism to be developed in consultation with State Pollution Control Board	5.00
21	Unforeseen & miscellaneous	3.00
	Total	**257.00**

(Rupees Two Crore Fiftyseven Lakhs) only.

Item No.14, 15 and 16 shall be purchased by the User Agency and to provide the same to Principal C.C.F. (WL) & Chief Wildlife Warden, Orissa / D.F.O., Sambalpur (South) Division immediately. Item No. 17, 18 & 19 shall be deposited by the User Agency along with vehicle with PCCF(WL)/DFO.

N.B.: All measures for dump reclamation should be taken up including retaining walls , plantation etc. as per the reclamation plan to be prepared in terms of the approved mining plan and other guidelines. This component is to be dealt separately as per the above guidelines. Hence no financial forecast on this account is indicated in the conservation plan.

Approved

Principal Chief Conservator of Forests
(Wildlife) & Chief Wildlife Warden
Odisha, Bhubaneswar

References

REFERENCE

- Working Plan of Sambalpur (South) Forest Division by Sri P.K.Sethi, O.F.S. from 2007-08 to 2016-17.
- District Statistical Hand Book of Sambalpur District.
- Forest Diversion Proposal Prepared by the User Agency.
- Environmental Impact Assessment & Environment Management Plan Prepared for this Coal Mine.
- District Gazetteer of Sambalpur District.
- National Wildlife Action Plan Prepared by Govt. of India.
- Orissa Forest Act, 1972 with latest amendment.
- Wildlife (Protection) Act, 1972.
- Forest (Conservation) Act, 1980 Amended up to 2004.
- Mammals of India by S.H. Prater
- Indian Birds by Salim Ali
- Reptiles of India by J. C. Daniel.
- Wildlife Wealth of Orissa (Govt. Publication).
- Notes on Forest Protection.
- Flora of Orissa – Saxena & Brahman (OFDC Ltd.).
- Wild Orissa (2004)-Wildlife Wing, F.D.,Orissa.

Plates

PLATES

SL. NO.	DESCRIPTION	PLATES
01	Location Map of the Talabira-I Coal Mine	**Plate-I**
02	Location Map of Talabira-I Coal Mine w.r.t. Proposed Elephant Corridor	**Plate-II**
03	Satellite Imagery showing Coal Mines & Industries Around the Talabira Coal Mines	**Plate-III**

Location Map of the Talabira-I Coal Mine

LOCATION

Sambalpur, Orissa

Toposheet No : 64 O/14

Latitude : 21° 42' 58" - 21° 44' 37"(N)

Longitude : 83° 58' 51"-84° 00' 39"(E)

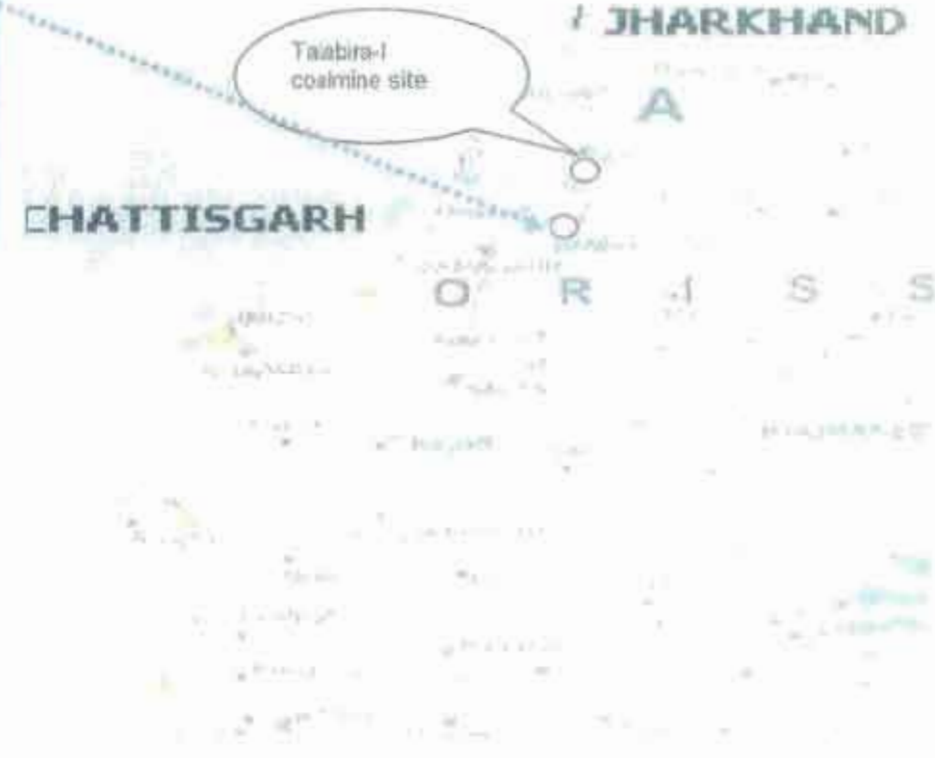
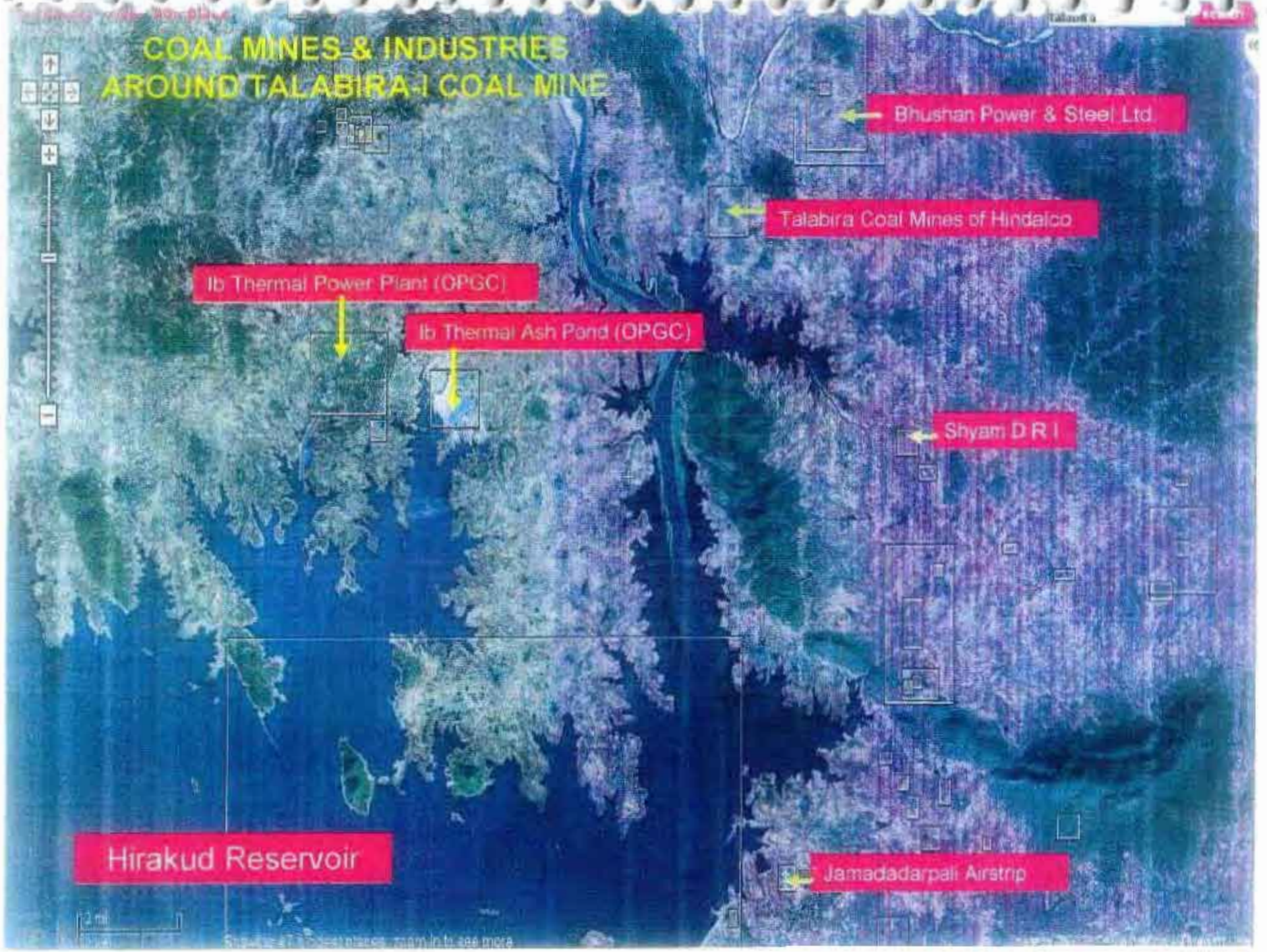
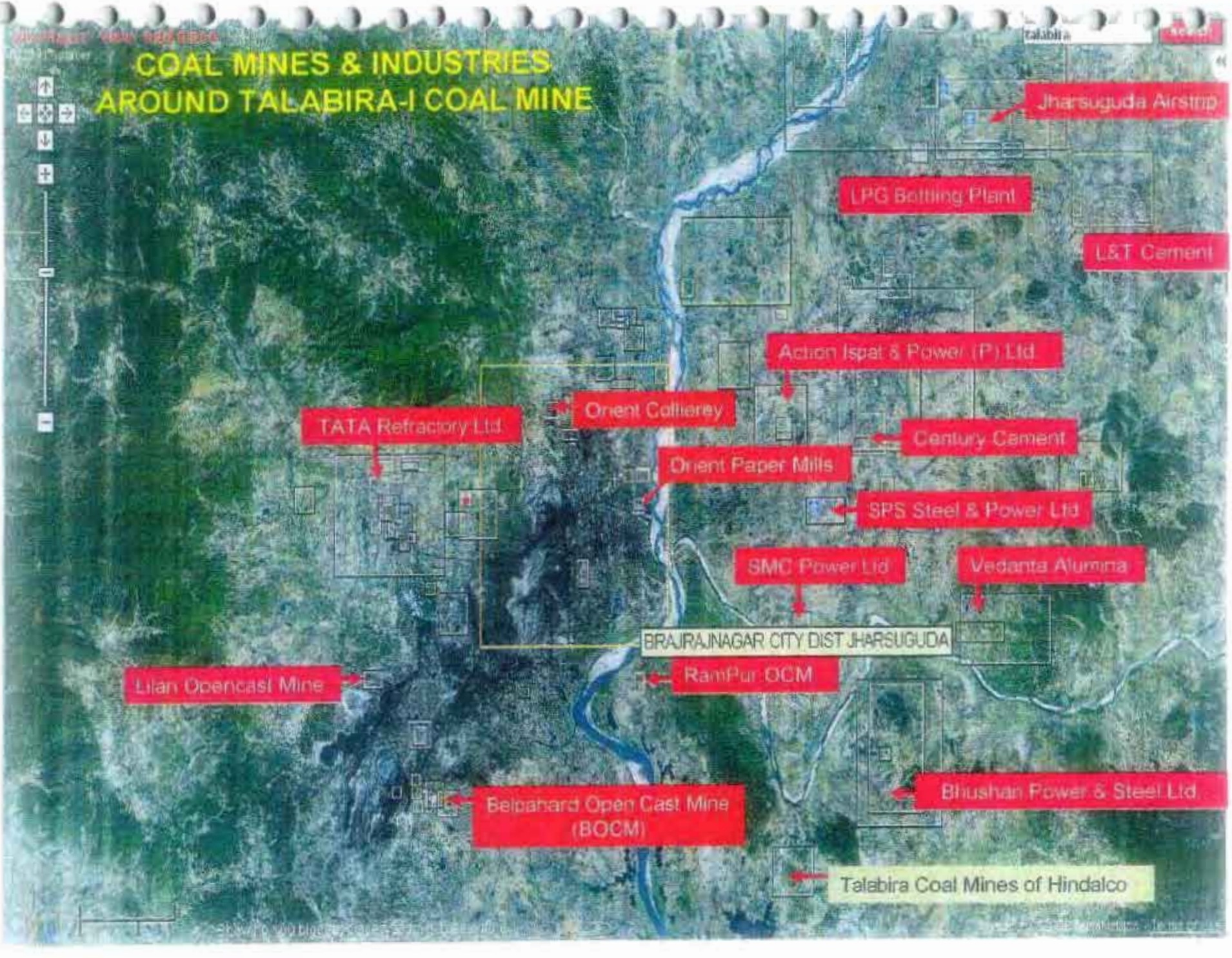


PLATE : 1



SATELLITE IMAGERY SHOWING COAL MINES & INDUSTRIES
AROUND TALABIRA – I COAL MINE

PLATE : III



SATELLITE IMAGERY SHOWING COAL MINES & INDUSTRIES
AROUND TALABIRA – I COAL MINE

PLATE III

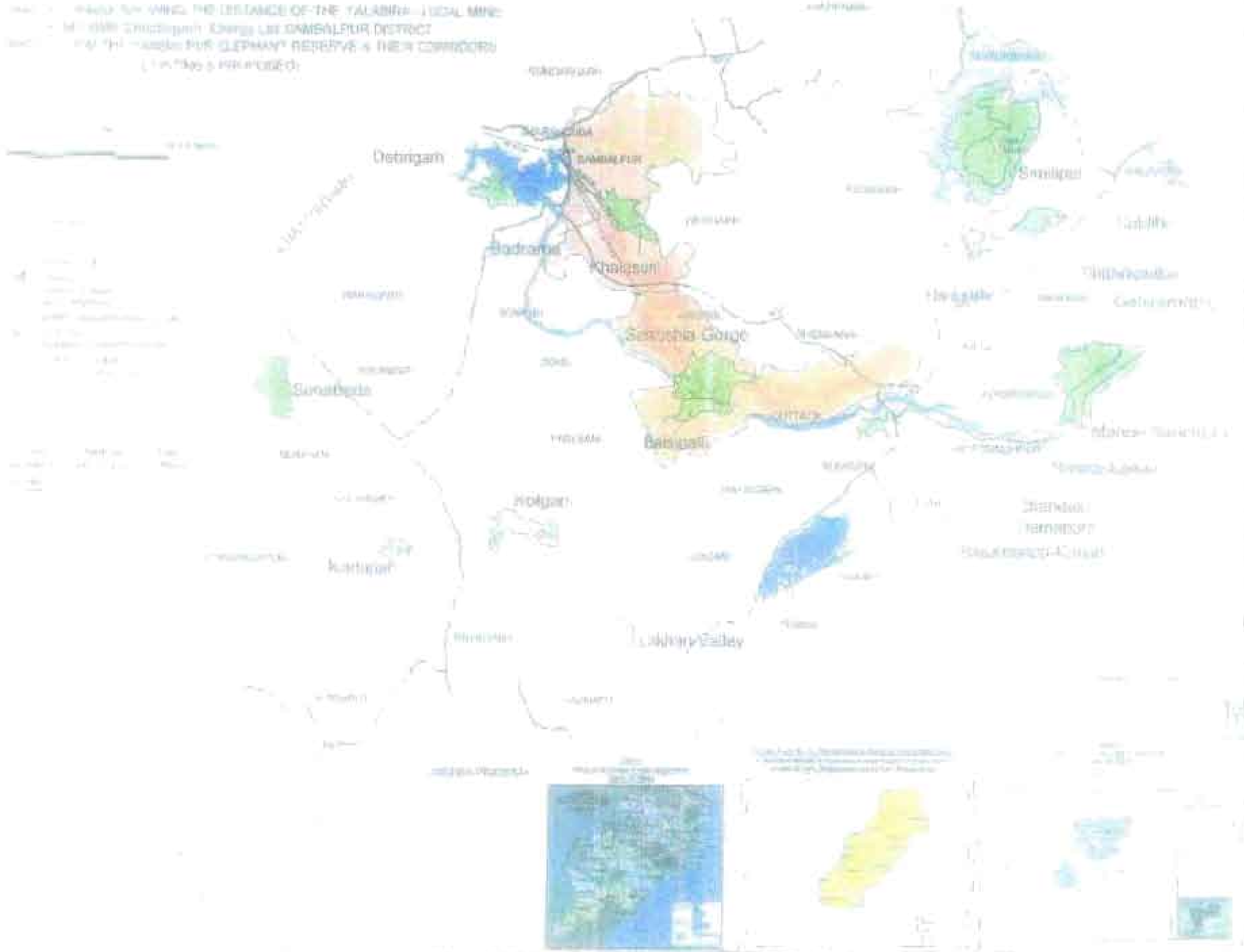

Debrigarh
SAMBALPUR
Badrama
Khalasuni
Satkosia Gorge
Baisipalli
Simlipal
Kotgarh
Karlapat
Sunabeda
Lakhari Valley
CUTTACK

PLATE : III

SATELLITE IMAGERY SHOWING COAL MINES & INDISTRIES AROUND TALABIRA – I COAL MINE

Annexures

ANNEXURE

SL. NO.	DESCRIPTION	ANNEXURE
01	Copy of Consent Letter from Ministry of Coal Regarding Approval of Revised Mining Plan OF 1.5 MTPA	ANNEXURE I
02	Vesting order No.104/2/2015 dt. 23/03/2015	ANNEXURE - II
03	Copy of Consent to operate from Pollution Control Board for the mine under both Water & Air Act	ANNEXURE : III
04	Copy of Environmental Clearance for 3.0 MTPA Open Coal Mine Project	ANNEXURE : IV
05	List of Industries around the Mine	ANNEXURE : V
06	Yearwise break-up of works to be taken up inside the Project area of 170.305 Ha by M/s GMR Chhattisgarh Energy Ltd	ANNEXURE : VI
07	Yearwise break-up of works to be taken up in the Buffer Zone of 10 km radius by Govt. Authority	ANNEXURE : VII,

ANNEXURE-I

Government of India
Ministry of Coal

No. [illegible] dated 14.7.2006

To

M/s Hindalco Industries Ltd
UCO Bank Building, 4[th] Floor,
Parliament Street,
New Delhi-110001.

Subject :- Approval of revised mining plan in respect of Talabira-I coal mine for enhancement of production capacity from 0.6 mty to 3.5 mty.

Sir,

I am directed to refer to your letter dated 13.1.2006 on the above subject and to state that the revised mining plan of Talabira-I coal block has been considered and approved by Government in exercise of the power conferred by Section 5(2) of the Mines & Minerals (Development & Regulation) Act, 1957 subject to the condition that the approval of the mining plan is without prejudice to the requirement of approvals from competent/prescribed authority under the relevant rules/regulations etc. Two copies of the revised mining plan is also returned herewith.

Yours faithfully,

(V.S.Rana)
Under Secretary to the Govt. of India

Encl : As above.

N.B. A copy of the revised mining plan may be submitted to the coal controller, Kolkata, who has been assigned the work of monitoring progress of end-use plants and captive mines.

(Section Officer)

REVISED MINE PLAN

[illegible] Million Tonnes Per Annum
of

TALABIRA-I COAL MINE
Ib Valley Coalfield

DISTRICT SAMBALPUR, ORISSA

October 2005

Prepared Under Section 22-B
Of Mineral Concession Rules, 1960

डी.एस. राणा / D. S. RANA
अवर सचिव / Under Secretary
कोयला मंत्रालय / Ministry of Coal
भारत सरकार / Govt of India
New Delhi

P. P. GIRBE
R Q P
No. 34011/21/2004 [illegible]
Dated 5. 10. [illegible]

ANNEXURE -II

Government of India

Ministry of Coal

O/o the Nominated Authority

World Trade Tower, New Delhi

Office of the nominated authority constituted under section 6 of the Coal Mines (Special Provisions) Second Ordinance, 2014

Vesting order under clause (b) of sub-rule (2) of rule 7 and sub-rule (1) of rule 13

In re: **Talabira-I Coal Mine** (the "mine") particulars of which is specified in **Annexure 1**

Order no.: 104/2/2015/NA

Date: March 23, 2015

In favour of: **GMR Chhattisgarh Energy Limited** incorporated in India under the Companies Act, 1956 with corporate identity number U40108KA2008PLC047974, whose registered office is at Skip House, 25/1, Museum Road, Bangalore, Karnataka – 560025, India and principal place of business is at New Shakti Bhavan, No. 302, New Udaan Bhavan Complex, Opposite Terminal 3, IGI Airport, New Delhi- 110037 (the "successful bidder")

For utilisation in: End Use Plant situated at Village Raikheda, District-Raipur, Chhattisgarh – 493225, India, as more particularly described below (the "End Use Plant"):

S. No.	Name of Specified End Use Plant	Address	Configuration	Capacity	Coal Entitlement
1.	GMR Chhattisgarh Energy Ltd.	Village Raikheda, District - Raipur, Chhattisgarh 493225	2 X 685 MW	1370 MW	297.06 MT

MW: Mega Watt; MT: Million Tonne

WHEREAS, the nominated authority has, in accordance with provisions of the Coal Mines (Special Provisions) Second Ordinance, 2014 (the "Ordinance") and the Coal Mines (Special Provisions) Rules 2014 (the "Rules") conducted the auction of the mine;

AND WHEREAS the successful bidder is eligible to receive this vesting order with respect to the mine including, inter-alia, -

(a) the coal bearing land acquired by the prior allottee and the lands, in or adjacent to the coal mines used for coal mining operations acquired by the prior allottee; and

(b) any existing mine infrastructure as defined in clause (j) of sub-section (1) of section 3 of the Ordinance;

AND WHEREAS the successful bidder has furnished a performance bank guarantee dated March 19, 2015 for an amount equal to INR 1,59,33,87,000 (Indian Rupees One Hundred Fifty Nine Crore Thirty Three Lakh and Eighty Seven Thousand) issued by Axis Bank in accordance with the tender document and in accordance with the provisions of sub-section (6) of section 8 of the Ordinance and sub-rule (4) of rule 13 of the rules.

AND WHEREAS the successful bidder has entered into a Coal Mine Development and Production Agreement dated March 2, 2015 ("CMDPA") (as amended) with the nominated authority in accordance with the provisions of sub-rule (5) of rule 13.

NOW, THE NOMINATED AUTHORITY DOES ORDER:

1. On and from April 1, 2015 ("vesting date") and in accordance with the provisions of sub-section (4) of section 8 of the Ordinance, with respect to the mine, the following shall stand fully and absolutely transferred and vested in the successful bidder, namely: -
   (a) all the rights, title and interest of the prior allottee in and over the land and mine infrastructure free from all encumbrances;
   (b) entitlement to a mining lease to be granted by the State Government with the terms and conditions of CMDPA forming a part of it on making an application;
   (c) all statutory licences, permits, permissions, approvals or consents as per rules, required to undertake coal mining operations in the mine, if already issued by the Central Government, to the prior allottee on the same terms and conditions as were applicable to the prior allottee, as listed in the **Annexure 2**;
   (d) entitlement to any statutory licence, permit, permission, approval or consent required to undertake coal mining operations in the mine, if already issued by the Central Government, to the prior allottee on making an application on the same terms and conditions as were applicable to the prior allottee, as listed in the **Annexure 3**;
   (e) entitlement to any statutory licence, permit, permission, approval or consent required to undertake coal mining operations in the mine, if already issued by the State Government, to the prior allottee on making an application on the same terms and conditions as were applicable to the prior allottee, as listed in the **Annexure 4**;
   (f) rights appurtenant to the approved mining plan of the prior allottee;
   (g) any subsisting contract in relation to coal mining operations, to which the prior allottee was a party and which is assumed, adopted and continued by the successful bidder and listed in the **Annexure 5** shall stand novated (by virtue of a deemed consent from the relevant party(ies)), in accordance with the provisions of sub-section (1) of section 11 of the Ordinance in favour of the

successful bidder for the residual term or residual performance of such contract;

2. The successful bidder may seek any change in the terms and conditions attached to such licence, permit, permission, approval or consent by making an application in accordance with applicable laws;

3. Hereinafter, the successful bidder shall be entitled to take possession of the mine as specified in Annexure I without let or hindrance;

4. This vesting order is liable to be cancelled in accordance with the provisions of sub-rule (6) of rule 13.

Vivek Bharadwaj

(By the nominated authority)

Annexures

Annexure 1: Particulars of the mine

Part A – Description of the mine

Name of Coal Mine	Talabira-I
Coal Field	Ib Valley Coalfield
Latitude	$21^0$42'37'' N to $21^0$44'58'' N
Longitude	$84^0$58'51'' E to $84^0$00'39'' E
Villages	Khinda
Tehsil/ Taluka	Rengali/ Katerbaga
District	Sambalpur
State	Odisha

Part B – Description of Land in relation to the mine

Type of Land: Freehold Land for Mining as per Mining Lease

Nil

Type of Land: Leasehold Land for Mining as per Mining Lease

Nature	Area (Hectares)
Government Land	31.70
Private Land	78.74
Forest Land	49.62

Part C – Description of Mine Infrastructure in relation to the mine

C1- Mine Infrastructure: Immovable Assets

S. No.	Head of Assets	Description (Nature of Assets)
1	Building	Residential Building
2	Building	Community Centre
3	Building	Health Centre - Renovation
4	Building	Primary School
5	Roads & Drains	Colony Road
6	Roads & Drains	Artery Road
7	Building	Ponds & Tube Well
8	Building	Borewell
9	Building	Statutory Building
10	Building	Work Shop / Garage
11	Building	Statutory Building

S. No.	Head of Assets	Description (Nature of Assets)
12	Building	Adminstrative Building
13	Building	Work Shop
14	Building	Mines Manager Statutory Residence
15	Building	Additional Store Building
16	Building	Visitor's Room
17	Building	Boundary Wall Trench II Area
18	Building	Vocational Training Center - Talabira
19	Building	First Aid Center – Talabira
20	Building	Lab. Building of Talabira
21	Building	Construction of Damaged Adminstrative Building
22	Building	Open Well
23	Building	Plant Building
24	Building	Boundary Wall
25	Building	Garland Drain
26	Building	Garland Drain
27	Building	Settling Tank & Discharge Pit
28	Roads & Drains	Roads & Drain
29	Roads & Drains	Approch Road - Part
30	Roads & Drains	Approch Road
31	Roads & Drains	Embakment Road
32	Roads & Drains	Embakment Road
33	Weigh Bridge	Weigh Bridge - Structure
34	Weigh Bridge	Weigh Bridge - Eletronic Components
35	Plant & Machinery	Effluent Treatment Plant - For Talabiara
36	Electrical Equipments & Fittings	Mines Electrification (Extension)
37	Building	Fabrication of Tower for Lighting
38	Electrical Equipments & Fittings	Addition to Power Line
39	Electrical Equipments & Fittings	New Power Line
40	Electrical Equipments & Fittings	New Power Line
41	Plant & Machinery	Automatted Water Sprinking System
42	Plant & Machinery	1 Serge Arrestor + 2 Protectors
43	Electrical Equipments & Fittings	100 KVA Copper wounded Transformer
44	Electrical Equipments & Fittings	100 KVA Copper wounded Transformer
45	Electrical Equipments & Fittings	Miscelleneous Electricals

Govt. of India Min Coal Nominated Authority

S. No.	Head of Assets	Description (Nature of Assets)
46	Weigh Bridge	Weigh Bridge make Essae Digitronics (100 MT)
47	Building	Construction of Boundary Wall 4 Mtr Height at North West Corner
48	Roads & Drains	Diversion of Road for OB Dump at Talabira Mine
49	Roads & Drains	Mines Boundary Wall (R & R colony side)

C2- Mine Infrastructure: Land for Compensatory Afforestation

Type of Land: Freehold Land for Compensatory Afforestation

Nil

Type of Land: Leasehold Land for Compensatory Afforestation

Nature	Area (Hectares)
Government Land	50.10
Private Land	-
Forest Land	-

C3- Mine Infrastructure: Resettlement and Rehabilitation Land

Type of Land: Resettlement and Rehabilitation Freehold Land

Nil

Type of Land: Resettlement and Rehabilitation Leasehold Land

Nature	Area (Hectares)
Government Land	9.08
Private Land	-
Forest Land	-

Annexure 2: Particulars of statutory licences, permits, permissions, approvals or consents issued by the Central Government which are being transferred alongwith this vesting order.

S. No	Statutory Clearance	Ministry	Letter No.	Date
1.	Approval of Mining Plan a) (i) Mining plan of M/s Indian Aluminium Company Limited in respect of Talabira-I captive coal mining block-Approval Reg.	Ministry of Coal	13016/11/1996-CA;	28.05.1997
	a) (ii) Revised mining plan of M/s Indian Aluminium Company Limited in respect of Talabira-I captive coal mining block-Approval Reg.		13016/11/1996-CA	10.12.1998
	a) (iii) Approval of revised mining plan in respect of Talabira –I coal mine for enhancement of production capacity from 0.4 MTY to 1.5 MTY		13016/8/2006-CA	14.07.2006
	a) (iv) Approval of revised mining plan 2nd revision (October 2009) for 3.0 MTPA in respect of Talabira –I coal mine		13016/8/2006-CA	3/4.2.2010
	b) Mine Closure Plan		34011-29/2011-CPAM	6.2.2012
2.	Mining Lease – Administrative Approval of the Central Government under Section 5 (1) and/ or Section 6 (1) of MMDR Act, 1957	Ministry of Coal	13016/11/1996-CA	

भारत सरकार कोयला मंत्रालय Govt. of India M/o Coal Nominated Authority

Annexure 3: Particulars of statutory licences, permits, permissions, approvals or consents issued by the Central Government to be obtained on application by the successful bidder.

S. No	Statutory Clearance	Ministry/ Agency	Letter No.	Date
1.	**Environment Clearance** Expansion of Talabira-I opencast coal mine project (1.5 MTPA to 3.0 MTPA in an ML area of 170.30 ha) of M/s Hindalco Industries limited, located in village Khinda, Tehsil Rengali, Dist. Sambalpur, Odisha Environmental Clearance-Reg.	Ministry of Environment and Forests	J-11015/58/2009-IA.II (M)	08.11.2011
2.	**Forest Clearance – Stage 1 and Stage 2** a) Diversion of 45.46 ha of forest land for Talabira Block-I Coal mine in Sambalpur District of Orrisa in favour of M/s India Aluminium Company Limited	Ministry of Environment and Forests	8-89/98-FC	16.05.2002
	b) Diversion of 9.16 ha (including safety zone of 0.11 ha) of forest land in addition to 45.46 ha of forest land already diverted in Talabira-I coal mine the mining lease area of 170.305 ha by M/s Hindalco Industry limited in Sambalpur forest division of Sambalpur district of Odisha during original lease period		8-89/98-FC (Vol.)	13.08.2014
3.	**Mine opening**	Ministry of Coal –	–	20.02.2006

S. No	Statutory Clearance	Ministry/ Agency	Letter No.	Date
	permission – Rampur Top & Bottom seams Nos. I, II and III	CCO		
4.	Opening of Escrow Account	Ministry of Coal – CCO	--	10.03.2014
5.	Permission from DGMS for Mine Opening	Ministry of Labour – DGMS		
6.	Permission of installation/ Trial Operation of Equipments	Ministry of Labour – DGMS		
7.	Ground water clearance	Ministry of Environment and Forests – Central Ground Water Board		
8.	Railway Siding Approvals	Ministry of Railway		
9.	Explosive Licenses	Ministry of Commerce, DIPP		
10.	Diesel Storage Tank	Ministry of Commerce, DIPP		
11.	*(Any Other clearance)*			

Annexure 4: Particulars of statutory licences, permits, permissions, approvals or consents issued by the State Government to be obtained on application by the successful bidder.

S. No	Statutory Clearance	Ministry/ Agency	Letter No.	Date
1.	Consent to establish	State Pollution Control Board		
2.	Project Import Benefit	State Mineral Resource Department		
3.	Grant of Mining Lease	State Government		
4.	Land Mutation	State Government		
5.	Power Line from State Electricity Board	State Electricity Board		
6.	*(Any Other clearance)*			

Annexure 5: Particulars of the contracts adopted by the successful bidder.

S. No.	Description	Name of Contractor/ Service Provider
1	Operational Support to the e-Mining Software	CSM Technologies Pvt. Ltd.

ANNEXURE-III

BY REGD. POST WITH AD

STATE POLLUTION CONTROL BOARD, ODISHA

A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012
Phone-2561909, Fax: 2562822, 2560955 E-mail: paribesh1@ospcboard.org, Website: www.ospcboard.org

CONSENT ORDER

No. 10225 / IND-I-CON- 2707 Dt. 22.06.2016

CONSENT ORDER NO. 1260

Sub : **Consent for discharge of sewage and trade effluent under section 25/26 of Water (PCP) Act, 1974 and for existing / new operation of the plant under section 21 of Air (PCP) Act, 1981.**

Ref : Your online application No. **254773, Dated 30.04.2015**

Consent to operate is hereby granted under section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 and under section 21 of Air (Prevention & Control of Pollution) Act, 1981 and rules framed thereunder to

Name of the Industry: TALABIRA-1 COAL MINE OF M/S. GMR CHHATTISGARH ENERGY LTD.

Name of the Occupier & Designation: TARUN KUMAR GHOSH, MINE AGENT

Address: AT: KHINDA, P.S: KATARBAGA, TEHSIL: RENGALI, DIST: SAMBALPUR

This consent order is valid for the period up to **31.03.2016**

Details of Products Manufactured

Sl. No.	Product	Quantity
1.	Coal	3.0 MTPA

This consent order is valid for the specified outlets, discharge quantity and quality, specified chimney/stack, emission quantity and quality of emissions as specified below. This consent is granted subject to the general and special conditions stipulated therein.

A. Discharge permitted through the following outlet subject to the standard

Out let No.	Description of outlet	Point of discharge	Quantity of discharge KL/hr	Pre-scribed Standard				
				pH	TSS (mg/l)	Oil & Grease (mg/l)	BOD (mg/l)	COD (mg/l)
01	Septic tank (Domestic effluent)	Soak pit	--	5.5 to 9.0	200	--	100	--
02	Mine drainage water / surface run off / other wastewater	Nearby land / inland surface water	21720	5.5 to 9.0	100	10	--	250

B. Emission permitted through the following stack subject to the prescribed standard

Chimney Stack No.	Description of Stack	Stack height (m)	Quantity of emission	Prescribed Standard			
				PM (mg/Nm^3)	SO_2	NO_x	
						--	

C. Disposal of solid waste permitted in the following manner

Sl. No.	Type of Solid waste	Quantity generated (TPD)	Quantity to be reused on site(TPD)	Quantity to be reused off site(TPD)	Quantity disposed off (TPD)	Description of disposal site.
	Top soil/over burden	As per approved mining plan	--	--	--	As per approved mining plan

D. GENERAL CONDITIONS FOR ALL UNITS

1. The consent is given by the Board in consideration of the particulars given in the application. Any change or alternation or deviation made in actual practice from the particulars furnished in the application will also be the ground liable for review/variation/revocation of the consent order under section 27 of the Act of Water (Prevention & Control of Pollution) Act, 1974 and section 21 of Air (Prevention & Control of Pollution) Act, 1981 and to make such variations as deemed fit for the purpose of the Acts.

2. The industry would immediately submit revised application for consent to operate to this Board in the event of any change in the quantity and quality of raw material / and products / manufacturing process or quantity /quality of the effluent rate of emission / air pollution control equipment / system etc.

3. The applicant shall not change or alter either the quality or quantity or the rate of discharge or temperature or the route of discharge without the previous written permission of the Board.

4. The application shall comply with and carry out the directives/orders issued by the Board in this consent order and at all subsequent times without any negligence on his part. . In case of non-compliance of any order/directives issued at any time and/or violation of the terms and conditions of this consent order, the applicant shall be liable for legal action as per the provisions of the Law/Act.

5. The applicant shall make an application for grant of fresh consent at least 90 days before the date of expiry of this consent order.

6. The issuance of this consent does not convey any property right in either real or personal property or any exclusive privileges nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State laws or regulation.

7. This consent does not authorize or approve the construction of any physical structure or facilities or the undertaking of any work in any natural water course.

8. The applicant shall display this consent granted to him in a prominent place for perusal of the public and inspecting officers of this Board.

9. An inspection book shall be opened and made available to Board's Officers during the visit to the factory.

10. The applicant shall furnish to the visiting officer of the Board any information regarding the construction, installation or operation of the plant or of effluent treatment system / air pollution control system / stack monitoring system any other particulars as may be pertinent to preventing and controlling pollution of Water / Air.

11. Meters must be affixed at the entrance of the water supply connection so that such meters are easily accessible for inspection and maintenance and for other purposes of the Act provided that the place where it is affixed shall in no case be at a point before which water has been taped by the consumer for utilization for any purposes whatsoever.

12. Separate meters with necessary pipe-line for assessing the quantity of water used for each of the purposes mentioned below:

    a) Industrial cooling, spraying in mine pits or boiler feed.

    b) Domestic purpose

    c) Process

13. The applicant shall display suitable caution board at the face where the effluent is entering into any water-body or any other place to be indicated by the Board, indicating therein that the area into which the effluents are being discharged is not fit for the domestic use/bathing.

14. Storm water shall not be allowed to mix with the trade and/or domestic effluent on the upstream of the terminal manholes where the flow measuring devices will be installed.

15. The applicant shall maintain good house-keeping both within the factory and the premises. All pipes, valves, sewers and drains shall be leak-proof. Floor washing shall be admitted into the effluent collection system only and shall not be allowed to find their way in storm drains or open areas.

16. The applicant shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems install or used by him to achieve with the term(s) and conditions of the consent.

17. Care should be taken to keep the anaerobic lagoons, if any, biologically active and not utilized as mere stagnation ponds. The anaerobic lagoons should be fed with the required nutrients for effective digestion. Lagoons should be constructed with sides and bottom made impervious.

18. The utilization of treated effluent on factory's own land, if any, should be completed and there should be no possibility of the effluent gaining access into any drainage channel or other water courses either directly or by overflow.

19. The effluent disposal on land, if any, should be done without creating any nuisance to the surroundings or inundation of the lands at any time.

20. If at any time the disposal of treated effluent on land becomes incomplete or unsatisfactory or create any problem or becomes a matter of dispute, the industry must adopt alternate satisfactory treatment and disposal measures.

21. The sludge from treatment units shall be dried in sludge drying beds and the drained liquid shall be taken to equalization tank.

22. The effluent treatment units and disposal measures shall become operative at the time of commencement of production.

23. The applicant shall provide port holes for sampling the emissions and access platform for carrying out stack sampling and provide electrical outlet points and other arrangements for chimneys/stacks and other sources of emissions so as to collect samples of emission by the Board or the applicant at any time in accordance with the provision of the Act or Rules made therein.

24. The applicant shall provide all facilities and render required assistance to the Board staff for collection of samples / stack monitoring / inspection.

25. The applicant shall not change or alter either the quality or quantity or rate of emission or install, replace or alter the air pollution control equipment or change the raw material or manufacturing process resulting in any change in quality and/or quantity of emissions, without the previous written permission of the Board.

26. No control equipments or chimney shall be altered or replaced or as the case may be erected or re-erected except with the previous approval of the Board.

27. The liquid effluent arising out of the operation of the air pollution control equipment shall be treated in the manner and to ion of standards prescribed by the Board in accordance with the provisions of Water (Prevention and Control of Pollution) Act, 1974 (as amended).

28. The stack monitoring system employed by the applicant shall be opened for inspection to this Board at any time.

29. There shall not be any fugitive or episodal discharge from the premises.

30. In case of such episodal discharge/emissions the industry shall take immediate action to bring down the emission within the limits prescribed by the Board in conditions/stop the operation of the plant. Report of such accidental discharge /emission shall be brought to the notice of the Board within 24 hours of occurrence.

31. The applicant shall keep the premises of the industrial plant and air pollution control equipments clean and make all hoods, pipes, valves, stacks/chimneys leak proof. The air pollution control equipments, location, inspection chambers, sampling port holes shall be made easily accessible at all times.

32. Any upset condition in any of the plant/plants of the factory which is likely to result in increased effluent discharge/emission of air pollutants and / or result in violation of the standards mentioned above shall be reported to the Headquarters and Regional Office of the Board by fax / speed post within 24 hours of its occurence.

33. The industry has to ensure that minimum three varieties of trees are planted at the density of not less than 1000 trees per acre. The trees may be planted along boundaries of the industries or industrial premises. This plantation is stipulated over and above the bulk plantation of trees in that area.

34. The solid waste such as sweeping, wastage packages, empty containers residues, sludge including that from air pollution control equipments collected within the premises of the industrial plants shall be disposed off scientifically to the satisfaction of the Board, so as not to cause fugitive emission, dust problems through leaching etc., of any kind.

35. All solid wastes arising in the premises shall be properly classified and disposed off to the satisfaction of the Board by :
   i) Land fill in case of inert material, care being taken to ensure that the material does not give rise to leachate which may percolate into ground water or carried away with storm run-off.
   ii) Controlled incineration, wherever possible in case of combustible organic material.
   iii) Composting, in case of bio-degradable material.

36. Any toxic material shall be detoxicated if possible, otherwise be sealed in steel drums and buried in protected areas after obtaining approval of this Board in writing. The detoxication or sealing and burying shall be carried out in the presence of Board's authorized persons only. Letter of authorization shall be obtained for handling and disposal of hazardous wastes.

37. If due to any technological improvement or otherwise this Board is of opinion that all or any of the conditions referred to above requires variation (including the change of any control equipment either in whole or in part) this Board shall after giving the applicant an opportunity of being heard, vary all or any of such condition and thereupon the applicant shall be bound to comply with the conditions so varied.

38. The applicant, his/heirs/legal representatives or assignees shall have no claim whatsoever to the condition or renewal of this consent after the expiry period of this consent.

39. The Board reserves the right to review, impose additional conditions or condition, revoke change or alter the terms and conditions of this consent.

40 Notwithstanding anything contained in this conditional letter of consent, the Board hereby reserves to it the right and power under section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 to review any and/or all the conditions imposed herein above and to make such variations as deemed fit for the purpose of the Act by the Board.

41. The conditions imposed as above shall continue to be in force until revoked under section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 and section 21 A of Air (Prevention & Control of Pollution) Act, 1981.

42. In case the consent fee is revised upward during this period, the industry shall pay the differential fees to the Board (for the remaining years) to keep the consent order in force. If they fail to pay the amount within the period stipulated by the Board the consent order will be revoked without prior notice.

43. The Board reserves the right to revoke/refuse consent to operate at any time during period for which consent is granted in case any violation is observed and to modify/ stipulate additional conditions as deemed appropriate

GENERAL CONDITIONS FOR UNITS WITH INVESTMENT OF MORE THAN Rs 50 CRORES, AND 17 CATEGORIES OF HIGHLY POLLUTING INDUSTRIES (RED A).

1. The applicant shall analyse the emissions every month for the parameters indicated in TABLE .B & C as mentioned in this order and shall furnish the report thereof to the Board by the 10th of the succeeding month.

2 The applicant shall provide and maintain at his own cost three ambient air quality monitoring stations for monitoring Suspended Particulate Matter, Sulphor Dioxide, Oxides of Nitrogen, Hydro-Carbon, Carbon-Monoxide and monitor the same once in a day/week/fortnight/month. The data collected shall be maintained in a register and a monthly extract be furnished to the Board.

3 The applicant shall provide and maintain at his own cost a meteorological station to collect the data on wind velocity, direction, temperature, humidity, rainfall, etc. and the daily reading shall be recorded and the extract sent to the Board once in a month.

4. The applicant shall forward the following information to the Member Secretary, State Pollution Control Board, Orissa, Bhubaneswar regularly.
   a. Report of analysis of stack monitoring, ambient air quality monitoring meteorological data as required every month.
   b. Progress on planting of trees quarterly.

5. The applicant shall install mechanical composite sampling equipment and continuous flow measuring / recording devices on the effluent drains of trade as well as domestic effluent. A record of daily discharge shall be maintained.

6. The following information shall be forwarded to the Member Secretary on or before 10th of every month.

   a. Performance / progress of the treatment plant.
   b. Monthly statement of daily discharge of domestic and/or trade effluent.

7. **Non-compliance with effluent limitations**

   a) If for any reason the applicant does not comply with or is unable to comply with any effluent limitations specified in this consent, the applicant shall immediately notify the consent issuing authority by telephone and provide the consent issuing authority with the following information in writing within 5 days of such notification.

      i) Causes of non-compliance

      i) A description of the non-compliance discharge including its impact on the receiving waters.

      ii) Anticipated time of continuance of non-compliance if expected to continue or if such condition has been corrected the duration or period of non-compliance.

      iii) Steps taken by the applicant to reduce and eliminate the non-complying discharge and

      iv) Steps to be taken by the applicant too prevent the condition of non-compliance.

   b) The applicant shall take all reasonable steps to minimize any adverse impact to natural waters resulting from non-compliance with any effluent limitation specified in this consent including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge.

   c) Nothing in this consent shall be construed to relieve the applicant from civil or criminal penalties for non-compliance whether or not such non-compliance is due to factors beyond his control, such as break-down, electric failure, accident or natural disaster.

8. The applicant shall at his own cost get the effluent samples collected both before and after treatment and get them analysed at an approval laboratory every month for the parameters indicated in Part-D and shall submit in duplicate the report thereof to the Board.

9. The addition of various treatment chemicals should be done only with mechanical dosers and proper equipment for regulation of correct dosages determined daily and for proper uniform feeding. Crude practices such as dumping of chemicals in drains or sumps or trickling of acids or alkalies arbitrarily and utilizing poles for stirring etc. should not be resorted to.

10. In the disposal of treated effluent on land for irrigation, the industry shall keep in view of the need for;

    Rotation of crops

    Change of point of application of effluent on land

    A portion of land kept fallow.

11. The adoption of these would avoid soil becoming sick or slate, the industry may ensure this in consultation with the Agriculture Department.

12. It is the sole responsibility of the industry to ensure that there are no complaints at any time from the royats in the surrounding areas as a result of discharge of sewage or trade effluent if any.

13. Proper housekeeping shall be maintained by a dedicated team.

14. The industry must constitute a team of responsible and technically qualified personnel who will ensure continuous operation of all pollution control devices round the clock (including night hours) and should be in a position to explain the status of operation of the pollution control measures to the inspecting officers of the Board at any point of time. The name of these persons with their contact telephone numbers shall be intimated to the concerned. Regional Officer and Head Office of the Board and in case of any change in the team it shall be intimated to the Board immediately.

E. SPECIAL CONDITIONS:

1) Excavation of coal shall be done using surface miners.

2) The annual coal production and compliance status report of the stipulated conditions shall be submitted to the Board latest by 30th April every year.

3) The environmental statement report for the financial year ending 31st March shall be submitted to the Board in form V on or before 30th September every year.

4) Check dams shall be constructed at strategic points in order to guide all surface run-off water containing sediments for settlement of suspended solids before discharge on land or into any surface water body during monsoon after meeting the standards prescribed.

5) Water generated during the process of dewatering of mine shall be used for sprinkling purposes on haulage roads and other dust generating areas instead of discharging the same to outside and excess water if any shall be pumped to the non-mining or abandoned pit/quarry so as to recharge the ground of the area. In case of non-existence of abandoned/ non-working pit/quarry, excess water shall be discharged to outside after adequate treatment and meeting the standards prescribed.

6) A water reservoir of adequate capacity shall be created for storage of the mine drainage water and surface runoffs so that the same can be used for industrial purposes.

7) Service centers i.e. auto shops, HEMM shops, and other areas, wherein, water pollution due to wash outs of oil and grease and suspended solids is expected, effluent treatment plant shall be provided. Action shall also be taken to reuse the workshop effluent instead of discharging to outside.

8) The top soil and external overburden shall be removed separately and stored it in a separate heap, duly covered with grass and vegetation or utilized for reclamation of mined out area.

9) Internal overburden shall be utilized for backfilling of mined out area. The backfilled area shall be biologically reclaimed.

10) Deep garland type trenches shall be provided all around the top soil dumps/overburden dumps/waste heaps terminating at sedimentation pond to prevent flow of silt directly to outside environment. The treated wastewater discharged to outside shall meet the prescribed standards.

11) Acid mine drainage water if any, shall be treated adequately before disposal to surrounding environment.

12) Discharge of inadequately treated wastewater of the mine to nearby surface water body shall not be allowed under any circumstances. Appropriate measures shall be taken to prevent pollution of nearby surface water bodies.

13) Domestic effluents of the township shall be treated in suitable and well-designed sewage treatment plant or shall be discharged to soak pit via septic tank constructed as BIS specifications.

14) Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected shall be submitted to the Board.

15) Action shall be taken for removal of residual coal going along with over burden so that spontaneous fire in the dump site can be eliminated.

16) Ambient air quality measured at a distance of 500m from the dust generating sources in the down wind direction shall meet the following standards.

Pollutant	Concentration in (microgram/m^3) (24 hourly)
SPM	- 500
RPM	- 250
SO_2	- 120
NO_x	- 120

In case any residential or commercial or industrial place falls within 500 metres of any generating sources, the National Ambient Air Quality Standards for industrial area notified shall be applicable.

17) Adequate **Ambient Air Quality Monitoring Stations** (at least six numbers) shall be established and location of the monitoring stations shall be decided in consultation with the Regional Officer, State Pollution Control Board.

18) **Monitoring of Ambient Air Quality** of the mine shall be done once in a fortnight (24 hourly) **at 500 metres from the dust generating sources,** {Loading or un-loading, haul road, coal transportation road, coal handling plant (CHP), Railway siding, Blasting, Drilling, overburden dumps or any other dust generating external sources like nearby roads etc.} and data shall be submitted to the State Pollution Control Board once in six months.

19) Adequate measures shall be taken to control noise levels below the prescribed standards;

Noise level-	6 AM- 10 PM	-	75 dB(A)
	10 PM-6 AM	-	70 dB(A)

(Monitoring frequency for noise level shall be once in a fortnight)

20) Instant water shower system at the exit point of the quarry shall be provided and all heavy vehicles shall move through the instant shower system.

21) Coal handling plant, if any shall be provided with adequate dust extraction or dry fog system. Loading, unloading areas, coal stack yard and conveyor systems including all transfer points shall have adequate dust suppression measures. The pollution control systems shall be properly maintained and operated.

22) Adequate dust suppression measures shall be provided at railway siding to minimize the generation of fugitive dust emission during loading of coal.

23) All transportation roads shall be maintained properly to avoid creation of ruts and potholes.

24) All permanent haulage roads shall be black topped and shall have fixed water sprinklers on both sides. The system shall be properly maintained and operated to suppress the dust generated during transportation. Plantation of thick leaf trees on both sides of the road shall be done.

25) Mobile water sprinkling shall be provided for dust suppression on the temporary haulage roads and sprinkling of water shall be done at desired intervals to subside the dust.

26) All necessary precaution shall be taken to prevent fire in coal stack yards and coal seams. Necessary precautionary measures, inter allia, maintaining a minimum stock shall be taken to avoid fire hazards in the coal stack yard.

27) Monitoring data on air quality, water/wastewater quality and noise quality shall be electronically displayed at the entry of the mine or at any other suitable location of the mine.

28) The mine shall take appropriate action for providing drinking water in the peripheral villages.

29) Plantation of trees shall be undertaken in the colony/ township, over top soil dumps, OB dumps, back filled areas, along the side of haul road and in other areas of the mines not being utilized for mining activities. The mine shall take up avenue plantation and plantation in nearby village areas in consultation with DFO/Horticulture Department. The density of the plantation shall be around 2500 plants per hectare. Nursery shall also be developed for plantation activities within the ML area and free distribution of seedlings to nearby villagers. The annual statements pertaining to the number of trees planted areas where plantation has been done, survival percentage and area in Ha. covered under plantation shall be submitted to the Board, every year in prescribed format.

30) The mine shall take steps for fulfillment of all the stipulations and necessary measures to check pollution

31) Mining operation is subject to availability of all other statutory clearances required under relevant Acts/Rules.

32) The mine shall submit a declaration by 30th of April every year that all pollution control systems are in good condition, operated and ambient air quality as well as wastewater quality conforms to the prescribed standards.

MEMBER SECRETARY
STATE POLLUTION CONTROL BOARD, ODISHA

To,

THE MINE AGENT,
TALABIRA - 1 COAL MINE,
M/S. GMR CHHATTISGARH ENERGY LTD.
AT-KHINDA, P.S.-KATARBAGA,
DIST-SAMBALPUR, ODISHA

Memo No._____/Dt.

Copy forwarded to :

i) Regional Officer, State Pollution Control Board, **Sambalpur.** He is requested to inspect the mines within 15 days of operation, verify the adequacy of surface runoff management facility, functioning of pollution control systems and submit detail report along with air and water monitoring reports.
ii) District Collector, **Sambalpur**
iii) Director of Mines, Govt. of Odisha, Bhubaneswar
iv) Director, Environment-cum-Special Secretary, F & E. Deptt. Govt. of Odisha, Bhubaneswar.
v) D.F.O, **Sambalpur**
vi) Deputy Director of Mines, **Sambalpur**
vii) Sr. Env. Engineer-L-I (C) (Hazardous waste cell)
viii) Cess Section (Head Office)
ix) Consent Register

SR. ENV. SCIENTIST (MINES)
STATE POLLUTION CONTROL BOARD, ODISHA

GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS

GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART –A : EFFLUENTS

Sl.No.	Parameters	Standards			
		Inland surface	Public sewers	Land for irrigation	Marine Costal Areas
		(a)	(b)	(c)	(d)
1.	Colour & odour	Colourless/Odourless as far as practible	——	See 6 of Annex-1	See 6 of Annex-1
2.	Suspended Solids (mg/l)	100	600	200	For process wastewater – 100 b. For cooling water effluent 10% above total suspended matter of influent.
3.	Particular size of SS	Shall pass 850	——	——	
5.	pH value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
6.	Temperature	Shall not exceed 5°C above the receiving water temperature	——	——	Shall not exceed 5°C above the receiving water temperature
7.	Oil & Grease mg/l max.	10	20	10	20
8.	Total residual chlorine	1.0	—	——	1.0
9.	Ammonical nitrogen (as N) mg/l max.	50	50	——	50
10.	Total Kajeldahl nitrogen (as NH_3) mg/1 max.	100	——	——	100
11.	Free ammonia (as NH_3) mg/1 max.	5.0	—	——	5.0
12.	Biochemical Oxygen Demand (5 days at (20°C) mg/1 max.	30	350	100	100
13.	Chemical Oxygen Demand, mg/1 max.	250	—	——	250
14.	Arsenic (as As) mg/1 max.	0.2	0.2	0.2	0.2
15.	Mercury (as Hg) mg/1 max.	0.01	0.01	——	0.001
16.	Lead (as pb) mg/1 max.	01.	1.0	——	2.0

17.	Cardmium.(as Cd) mg/1 max.	2.0	1.0	------	2.0
18.	Hexavalent Chromium (as Cr + 6) mg/l max.	0.1	2.0	-------	1.0
19.	Total Chromium (as Cr) mg/l max.	2.0	2.0	-------	2.0
20.	Copper (as Cu) mg/l max.	3.0	3.0	-------	3.0
21.	Zinc (as Zn) mg/l max.	5.0	15	-------	15
22.	Selenium (as Sc) mg/l max.	0.05	0.05	-------	0.05
23.	Nickel (as Nil) mg/l max.	3.0	3.0	-------	5.0
24.	Cyanide (as CN) mg/l max.	0.2	2.0	0.2	0.02
25.	Fluoride (as F) mg/l max.	2.0	15	-------	15
26.	Dissolved Phosphates (as P) mg/l max.	5.0	------	-------	-------
27.	Sulphide (as S) mg/l max.	2.0	-------	-------	5.0
28.	Phennolic compounds as (C_6H_5OH) mg/l max.	1.0	5.0	-------	5.0
29.	Radioactive materials a. Alpha emitter micro curie/ml. b. Beta emitter micro curie/ml.	10^7 10^6	10^7 10^8	10^8 10^7	10^7 10^8
30.	Bio-assay test	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent
31	Manganese (as Mn)	2 mg/l	2 mg/l	-------	2 mg/l
32.	Iron (Fe)	3 mg/l	3 mg/l	-------	3 mg/l
33.	Vanadium (as V)	0.2 mg/l	0.2 mg/l	-------	0.2 mg/l
34.	Nitrate Nitrogen	10 mg/l	-------	-------	20 mg/l

NATIONAL AMBIENT AIR QUALITY STANDARDS

Sl. No.	Pollutants	Time Weighed Average	Concentrate of Ambient Air		
			Industrial Residential, Rural and other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1.	Sulphur Dioxide (SO_2), µg/m³	Annual *	50	20	-Improved west and Gaeke
		24 Hours **	80	80	- Ultraviolet fluorescence
2.	Nitrogen Dioxide (NO_2), µg/m³	Annual *	40	30	- Modified Jacob & Hochheiser (Na-Arsenite)
		24 Hours **	80	80	- Chemiluminescence
3.	Particulate Matter (size less than 10µm) or PM_{10}µg/m³	Annual *	60	60	-Gravimetric - TOEM
		24 Hours **	100	100	- Beta Attenuation
4.	Particulate Matter (size less than 2.5µm) or $PM_{2.5}$ µg/m³	Annual *	40	40	-Gravimetric - TOEM
		24 Hours **	60	60	- Beta Attenuation
5.	Ozone (O_3) µg/m³	8 Hours **	100	100	- UV Photometric - Chemiluminescence
		1 Hours **	180	180	- Chemical Method
6.	Lead (Pb) µg/m³	Annual *	0.50	0.50	-AAS/ICP method after sampling on EMP 2000 or equivalent filter paper.
		24 Hours **	1.0	1.0	- ED-XRF using Teflon filter
7.	Carbon Monoxide (CO) mg/m³	8 Hours **	02	02	- Non Dispersive Infra Red (NDIR) Spectroscopy
		1 Hours **	04	04	
8.	Ammonia (NH_3) µg/m³	Annual*	100	100	-Chemiluminescence - Indophenol Blue Method
		24 Hours**	400	400	
9.	Benzene (C_6H_6) µg/m³	Annul *	05	05	-Gas Chromatography based continuous analyzer - Adsorption and Desorption followed by GC analysis
10.	Benzo (a) Pyrene (BaP)- Particulate phase only, ng/m³	Annual*	01	01	-Solvent extraction followed by HPLC/GC analysis
11.	Arsenic (As), ng/m³	Annual*	06	06	-AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
12.	Nickel (Ni),ng/m³	Annual*	20	20	-AAS/ICP method after sampling on EPM 2000 or equivalent filter paper

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year, 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Government of India
Ministry of Environment, Forest &Climate Change

Indira Paryavaran Bhawan
Aliganj Road.
Jor Bagh, New Delhi

No. J-11015/58/2009-IA-II.(M)

Dated: 16th April, 2015

To,

The General Manager (Mines)
GMR Chhattisgarh Energy Limited
Skip House, 25/1,
Museum Road
Bangalore
Karnataka-560025

E-mail: ranjitsingh.matharoo@gmrgroup.in

Subject: Transfer of Environmental Clearance of Talabira-I Opencast Coalmine Project (3.0MTPA) in an ML area of 170.30 ha at village Khinda, Tehsil Rengali, District Sambalpur Odisha from M/s HINDALCO Industries Ltd. to M/s GMR Chhattisgarh Energy Limited, Bangalore, Karnataka- reg.

The Ministry of Environment, Forest and Climate Change (MoEFCC), in accordance with the Environmental Impact Assessment (EIA) Notification, 2006 and subsequent amendment thereto had accorded Environmental Clearance (EC) for expansion of Talabira-I Opencast Coal mine Project (1.5 MTPA to 3.0 MTPA in an ML area of 170.30 ha at village Khinda, Tehsil Rengali, District Sambalpur, Odisha to M/s Hindalco Industries ltd. subject to compliance of terms and conditions stipulated in the EC letter No. J-11015/58/2009-IA.II (M) dated November 8, 2011.

WHEREAS the Supreme Court of India vide judgment dated 25th August, 2014 read with its order dated 24th September, 2014 has cancelled the allocation of 204 coal blocks and issued directions with regard to such coal blocks wherein the Central Government in pursuance of the said directions has to take immediate action to implement the said order.

WHEREAS in pursuance of the judgment and order of the Supreme Court, the nominated authority has, in accordance with provisions of the Coal Mines (Special Provisions) Second Ordinance, 2014 and the Coal Mines (Special Provisions) Rules 2014 conducted the auction of the mines.

WHEREAS Ministry of Coal (MOC) vide its O.M. letter no. 43020/20/2014-CPAM dated 16th March, 2015 has informed MoEFCC that MOC has recently approved 23 coal blocks (15 coal blocks from Schedule II and 8 coal blocks from Schedule III of the Ordinance) through bidding to different successful bidders/ companies. MOC has requested this Ministry to facilitate transfer of the Environment Clearance and Forest Clearance of these blocks to the new successful bidders before 31.03.2015.

WHEREAS Ministry of Coal vide Vesting Order under clause (b) of sub-rule (2) of rule 7 and sub-rule (1) of rule 13 and Order no. 104/2/2015/NA dated 23rd March, 2015 has allocated the Talabira-I Coal Mines located in village Khinda, Tehsil Rengali, District Sambalpur, Odisha, to M/s GMR Chhattisgarh Energy Limited, Registered Office at Skip House, 25/1, Museum Road, Bangalore, Karnataka – 560025 as the successful bidder.

WHEREAS vide Gazette Notification S.O. 811 (E) Notification dated 23.03.2015, MOEFCC has made amendments to paragraph 11 in the Gazette Notification S.O.1533 (E) dated 14th September, 2006. Vide the said amendment, where an allocation of coal block is cancelled in any legal proceeding, or by the Government in accordance with law, the environmental clearance granted in respect of such coal block may be transferred, subject to the same validity period as was initially granted, to any legal person to whom such block is subsequently allocated, and in such case, obtaining of "no objection" from either the holder of environment clearance or from the regulatory authority concerned shall not be necessary and no reference shall be made to the Expert Appraisal Committee or the State Level Expert Appraisal Committee concerned.

WHEREAS pursuant to the MOC vesting Order no. 104/2/2015/NA dated 23rd March, 2015 and MoEFCC Gazette Notification S.O. 811(E) Notification dated 23.03.2015, the EC granted vide letter no. J-11015/58/2009-IA.II (M) dated 8th November, 2011 to M/s HINDALCO Industries Ltd., for Expansion of Talabira-I Opencast Coalmine project (1.5 MTPA to 3.0MTPA) in an ML area of 170.30 ha at village Khinda, Tehsil Rengali, District Sambalpur, Odisha is hereby transferred to M/s GMR Chhattisgarh Energy Limited, Registered Office at Skip House, 25/1, Museum Road, Bangalore, Karnataka 560025 subject to the following conditions:

(i) Any change in scope of work will attract the provisions of Environment Protection Act (EPA), 1986 and Environmental Impact Assessment Notification, 2006 in conjunction with the subsequent amendments / circulars.

(ii) All conditions stipulated in the EC letter No. J-11015/58/2009-IA.II (M) dated 8th November, 2011 shall remain unchanged.

(iii) The successful bidder shall be liable, if any, for any act of violation of the EPA 1986 / EIA Notification 2006 /subsequent amendments and circulars which it has inherited during the transfer.

(iv) Successful bidder shall be liable for compliance of all court directions, if any.

(Dr R Warrier)
Director

Copy to :

1. Secretary, Ministry of Coal, New Delhi.
2. Secretary, Department of Environment & Forest, Government of Orissa, Secretariat, Bhubaneswar.
3. PCCF (WL), Govt. of Orissa in regard to implementation of WL Conservation Plan.
4. Chief Conservator of Forest, Regional Office (EZ), Ministry of Environment & Forest, A-Chadrashekarpur, Bhubaneswar -751023
5. Chairman, Orissa State Pollution Control Board, Parivesh Bhawan, A/118, Nilkanthanagar, Unit VIII, Bhubaneswar-751012.
6. Chairman, Central Pollution Control Board, CBD-cum-Office Complex, East Arjun Nagar, New Delhi
7. Member Secretary, Central Ground Water Authority, Ministry of Water Resources, Curzon Road Barracks, A-2, W-3, Kasturba Gandhi Marg, New Delhi.
8. District Collect, Sambalpur, Government of Orissa.
9. Monitoring File 10. Guard File 11 Record File.

(Dr R Warrier)
Director

List of Industries

Sr. No.	Name of the Industry	Location	Nature
1	**Aditya Aluminium Limited**	**At Rengali, Dist. Sambalpur**	**Aluminium Smelter &d CPP**
2	**Bhushan Steels Ltd.**	**At Thelkuli, Dist. Sambalpur**	**Steel and Power Plant**
3	**SMC Power generation Ltd.**	**At Hirma, Dist. Jharsuguda**	**Integrated Steel and Power Plant**
4	Shree Madhab Ispat (P) Ltd.	At Siriapalli, P.O.Paramanpur Dist. Jharsuguda	Sponge Iron
5	Singhal Enterprisers (P) Ltd.	At hirma, Dist. Jharsuguda	Sponge Iron
6	S.P.S Steel and Power Ltd.	At Kukurjanga, Via Badmal, Dist. Jharsuguda	Sponge Iron
7	Pawansut Sponge (P) ltd.	At Badmal, Dist. Jharsuguda	Sponge Iron
8	Bhagawati Steel (P) Ltd.	At badmal, Dist. Jharsuguda	Sponge Iron
9	L.N.Metallinks Ltd.	At Siripura, P.O.Telkuli, dist. Jharsuguda	Sponge Iron
10	Sevenstar Steels Ltd	At gudigaon, P.O:Kelandamal, Dist. Jharsuguda	Sponge Iron
11	Jaya Hanuman Udyog Ltd.	At Raghunathpalli, Dist. Jharsuguda	Sponge Iron
12	**Eastern Steel and Power Ltd**	**At Lahandabud, P.O:H.Katapali, Dist.Jharsuguda**	**Steel and Power**
13	**Action Ispat & Power (P) Ltd.**	**At Marakuta, Dist. Jharsuguda**	**Steel and Power**
14	Samaleswari Ferro Metals (P) Ltd.	At Bishalkhinda, Via Sason, Dist. Sambalpur	Sponge Iron
15	Samaleswari Industries (P) Ltd.	At Lapanga, Dist. Sambalpur	Sponge Iron
16	**Shyam DRI Power Ltd.**	**At Pondloi, Via. Rengali, Dist. Sambalpur**	**Sponge Iron, Liquid Steel, Ferro Manganese, Power**
17	**Viraj Steel and Energy Ltd.**	**At Gurupali, Rengali, Dist. Sambalpur**	**Integrated Steel and Power**
18	Aryan Ispat & Power (P) ltd.	At Bamaloi, Dist. Sambalpur	Sponge Iron

ANNEXURE - VI

List of Industries

Sr. No.	Name of the Industry	Location	Nature
19	R.B.Sponge Iron (P) ltd.	At Khengati, P.O.:Jayantpur, Dist. Sambalpur	Sponge Iron
20	Rathi Steel and Power Projects ltd.	At Potapali, Dist Sambalpur	Integrated Steel and Power
21	Ravi Metallics Pvt. Ltd	At Sansinghari, Sambalpur dist	Integrated Steel and Power
22	Kamadehunu Ispat Ltd.	At Dabra, Sambalpur Dist.	Integrated Steel and Power
23	Sri Krishna Ispat Pvt Ltd.	At Parmanpur, Sambalpur Dist.	Sponge Iron
24	T.R.Chemicals	At Belpada, Sambalpur dist.	Sponge Iron
25	Samaleswari Sponge Iron ltd	At katarbaga, Rengali	Sponge Iron
26	IB Thermal Power Station	At Banaharpali, Dist. Jharsuguda	Power generation
27	TATA Refractories Ltd	At belpahar, Dist. Jharsuguda	Manufacturing Process
28	Mahanadi Coal Fields Ltd	At Jagrutivihar, P.O.Burla, Dist. Sambalpur	Coal Mining
29	Ultra Tech Cement Ltd.	At Arda, Dist.Jharsuguda	Cement Production

PROJECT AREA : YEAR WISE REQUIREMENT OF FUNDS (In Lakh Rs.)

Works to be taken up in M.L. area : Annual phasing over 10 years

SLNo.	Item of Work	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10	TOTAL
1	Plantation over 70 ha *	3.50	9.80	2.80	2.10	1.40	1.40					21.00
2	Salt licks	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	1.00
3	Forest Protection : Ban Sahayaks - 2 @ Rs. 5000x12x10	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	12.00
4	Moisture Cons. & WHS	3.00				1.00				1		5.00
5	Photo voltaic Solar fencing	2.00		0.20		0.20		0.20		0.2	0.2	3.00
6	Public Awareness	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	3.00
7	Watch & Ward for fire prevention	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	5.00
8	Weed Control	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	3.00
	TOTAL	**10.90**	**12.20**	**5.40**	**4.50**	**5.00**	**3.80**	**2.60**	**2.40**	**3.60**	**2.60**	**53.00**

ANNEXURE : VII

BUFFER ZONE (10 KM RADIUS) : YEAR WISE REQUIREMENT OF FUNDS (In Lakh Rs.)

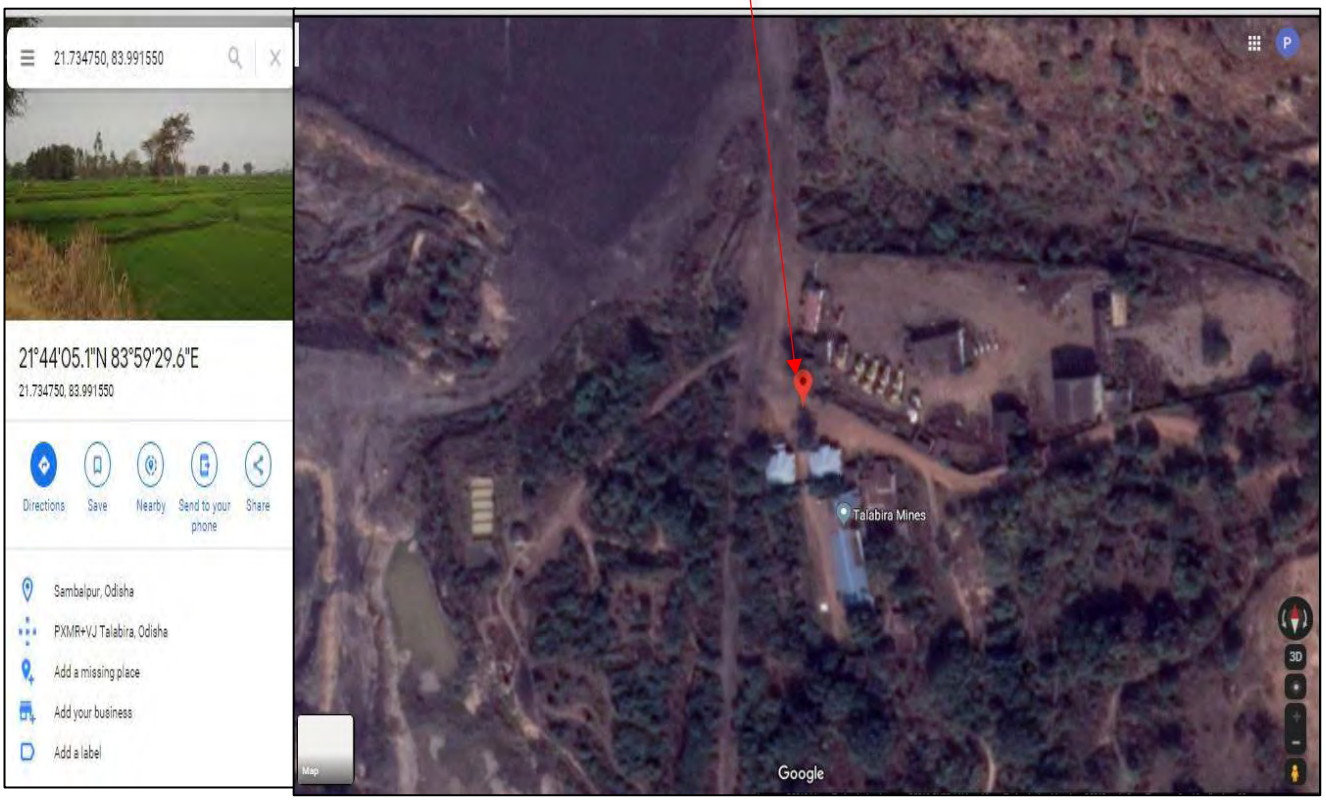
Works to be taken up in the Buffer Zone : Annual phasing over plan period

Sl. No.	Ref. to Para	Item of work	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10	TOTAL
1	5.2.4	a) Game tank (GT) - 2	6.00	6.00									12.00
		b) Maintenance G.T.					1.00		1.00			1.00	3.00
	5.2.5	c) Salt lick	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	2.00
2	5.2.3	a) Plantation for 100 ha (Food & Coverage)	5.00	14.00	4.00	3.00	2.00	2.00					30.00
		b) Seeding of grass 100 ha	2.00	2.00	2.00	1.00	1.00	1.00	1.00				10.00
3	5.2.3	Ban Sahayaks - 2	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	12.00
4	5.2.4	Moisture Conservation (Contor trench & Check dams)	3.00	3.00				1.00				1.00	8.00
5	5.2.8.3 & 5.2.9	Public Awareness & Capacity building	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	4.00
6	5.2.6	Fire Prevention (5 watchers for 5 months) & incentives to VSS	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	6.00
7	5.2.6	Watch Tower-1		3.00									3.00
8	5.2.8.2	Antidepredation squad	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	6.00
9	5.2.8.1	Corpus fund	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	5.00
10	5.2.7	Livelihood Improvement & micro credit to VSS / SHG	0.50	0.80	1.20	1.50	1.00	1.00	0.50	0.50	0.50	0.50	8.00
11	5.2.7	Alternate Avocation (Eco-tourism)	3.00	2.00	0.30	0.30	0.35	0.35	0.40	0.40	0.40	0.50	8.00
12	5.2.8.2	Community Storage/ godowns/metal bins	3.00	2.00									5.00
13	5.2.8.4	Solar fencing & maintenance (10 km)	5.00	5.00	0.30	0.30	0.35	0.35	0.40	0.40	0.40	0.50	13.00
14		Unforeseen & misc.	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	3.00
		TOTAL	**31.30**	**41.60**	**11.60**	**9.90**	**9.50**	**9.50**	**7.10**	**5.10**	**5.10**	**7.30**	**138.00**

ANNEXURE : VIII

ANNEXURE – 2

(Photographs of Installed Piezometer)


21.734750, 83.991550
21°44'05.1"N 83°59'29.6"E
21.734750, 83.991550
Directions
Save
Nearby
Send to your phone
Share
Sambalpur, Odisha
PXMR+VJ Talabira, Odisha
Add a missing place
Add your business
Add a label
Talabira Mines
Google

ANNEXURE – 3

Environment Monitoring Report

TALABIRA-I COAL BLOCK, SAMBALPUR

M/s Raipur Energen Limited

ANALYSIS REPORT ON ENVIRONMENTAL MONITORING DATA GENERATED FOR THE MONTH OF SEPTEMBER-2019

ENVIRONMENTAL MONITORING DONE BY

KALYANI LABORATORIES PVT. LTD.
LAB: PLOT NO. 78, MILLENIUM CITY,
PAHAL, BBSR-752101

This Report Contains Data On Ambient Air, Ground Water, Surface Water, Soil And Noise Monitoring And Analysis

CONTENTS

KALYANI LABORATORIES PVT. LTD. BBSR.

KALYANI LABORATORIES PVT. LTD.
78/944, PAHAL, BHUBANESWAR-752101, ODISHA

TEST REPORT

Test Report No.: KLPL-TR/09/19/AAQM-339A

Issue date: 28.09.2019

Name and address of the Customer: M/s Raipur Energen Limited.
Raikheda,Block-Tilda,dist-Raipur,493224,CG

Customer's reference: Service Order No.: 4800148522 Date-08.01.2019

Date of Sample Receipt: 23.09.2019 | **Testing Dt.:** 23.09.2019 | **Test completion Dt.:** 28.09.2019

Sample Description: Ambient Air Quality **No. of Samples:** 1

Sample Condition: Gaseous sample absorbing solutions refrigerated

Sampling Method used, if any: KLPL/SOP/ Air-06

Sl. No	Date of Sampling	Sampling Location	Parameters	Observed Value	NAAQS, 2009	Test Method
1.	17-18/09/2019	R & R Colony. 3.2 Km from the mines in direction of North East	Sulphur Dioxide (SO_2), $\mu g/m^3$	5.12	80	Guidelines for the Measurement of Ambient Air Pollutants Volume-I & II, CPCB
2.			Nitrogen Dioxide (NO_2), $\mu g/m^3$	9.26	80	
3.			Particulate Matter (Size less than 10µm) or PM10, go/m^3	60.0	100	
4.			Particulate Matter (Size less than 2.5µm) or PM2.5, $\mu g/m^3$	40.13	60	
5.			Lead (Pb), $\mu g/m^3$	< 0.02	01	
6.			Arsenic (As), ng/m^3	< 1.0	06	
7.			Mercury (Hg), ng/m^3	< 1.0	--	
8.			Chromium (Cr), ng/m^3	< 1.0	--	
Remarks		Nil				
Any unusual feature observed during determination				Nil		

End of Test Report

Authorized Signatory
Kalyani Laboratories Private Limited

KALYANI LABORATORIES PVT. LTD. BBSR.

KLPL- 33431A

KALYANI LABORATORIES PVT. LTD.
Kalyani Laboratories
78/944, PAHAL, BHUBANESWAR-752101, ODISHA

TEST REPORT

Test Report No.: KLPL-TR/09/19/AAQM-339B

Issue date: 28.09.2019

Name and address of the Customer: M/s Raipur Energen Limited.
Raikheda,Block-Tilda,dist-Raipur,493224,CG

Customer's reference: Service Order No.: 4800148522 Date-08.01.2019

Date of Sample Receipt: 23.09.2019 | **Testing Dt.:** 23.09.2019 | **Test completion Dt.:** 28.09.2019

Sample Description: Ambient Air Quality **No. of Samples:** 1

Sample Condition: Gaseous sample absorbing solutions refrigerated

Sampling Method used, if any: KLPL/SOP/ Air-06

Sl. No	Date of Sampling	Sampling Location	Parameters	Observed Value	NAAQS, 2009	Test Method
1.	18-19/09/2019	Weigh Bridge 0.5 Km from the mines in direction south	Sulphur Dioxide (SO_2), $\mu g/m^3$	6.72	80	Guidelines for the Measurement of Ambient Air Pollutants Volume-I & II, CPCB
2.			Nitrogen Dioxide (NO_2), $\mu g/m^3$	13.96	80	
3.			Particulate Matter (Size less than 10µm) or PM10, $\mu g/m^3$	46.0	100	
4.			Particulate Matter (Size less than 2.5µm) or PM2.5, $\mu g/m^3$	29.32	60	
Remarks			Nil			
Any unusual feature observed during determination			Nil			

End of Test Report

Authorized Signatory
Kalyani Laboratories Private Limited

KALYANI LABORATORIES PVT. LTD. BBSR.

KLPL- 33430A

KALYANI LABORATORIES PVT. LTD.
Kalyani Laboratories
78/944, PAHAL, BHUBANESWAR-752101, ODISHA

TEST REPORT

Test Report No.: KLPL-TR/09/19/AAQM-339C

Issue date: 28.09.2019

Name and address of the Customer: M/s Raipur Energen Limited.
Raikheda,Block-Tilda,dist-Raipur,493224,CG

Customer's reference: Service Order No.: 4800133242, Date-27.12.2016

Date of Sample Receipt: 23.09.2019 | **Testing Dt.:** 23.09.2019 | **Test completion Dt.:** 28.09.2019

Sample Description: Ambient Air Quality **No. of Samples:** 1

Sample Condition: Gaseous sample absorbing solutions refrigerated

Sampling Method used, if any: KLPL/SOP/ Air-06

Sl. No	Date of Sampling	Sampling Location	Parameters	Observed Value	NAAQS, 2009	Test Method
1.	17-18/09/2019	Near the Petrol pump	Sulphur Dioxide (SO_2), $\mu g/m^3$	4.13	80	Guidelines for the Measurement of Ambient Air Pollutants Volume-I & II, CPCB
2.			Nitrogen Dioxide (NO_2), $\mu g/m^3$	10.96	80	
3.			Particulate Matter (Size less than 10µm) or PM10, $\mu g/m^3$	50.0	100	
4.			Particulate Matter (Size less than 2.5µm) or PM2.5, $\mu g/m^3$	31.88	60	
Remarks		Nil				
Any unusual feature observed during determination		Nil				

End of Test Report

Authorized Signatory
Kalyani Laboratories Private Limited

KALYANI LABORATORIES PVT. LTD. BBSR.

KLPL- 33429A

KALYANI LABORATORIES PVT. LTD.
Kalyani Laboratories
78/944, PAHAL, BHUBANESWAR-752101, ODISHA

TEST REPORT

Test Report No.: KLPL-TR/09/19/AAQM-339D

Issue date: 28.09.2019

Name and address of the Customer: M/s Raipur Energen Limited.
Raikheda,Block-Tilda,dist-Raipur,493224,CG.

Customer's reference: Service Order No.: 4800148522 Date-08.01.2019

Date of Sample Receipt: 23.09.2019 | **Testing Dt.:** 23.09.2019 | **Test completion Dt.:** 28.09.2019

Sample Description: Ambient Air Quality **No. of Samples:** 1

Sample Condition: Gaseous sample absorbing solutions refrigerated

Sampling Method used, if any: KLPL/SOP/ Air-06

Sl. No	Date of Sampling	Sampling Location	Parameters	Observed Value	NAAQS, 2009	Test Method
1.	20-21/09/2019	In front of the Mines Office	Sulphur Dioxide (SO_2), $\mu g/m^3$	3.22	80	Guidelines for the Measurement of Ambient Air Pollutants Volume-I & II, CPCB
2.			Nitrogen Dioxide (NO_2), $\mu g/m^3$	14.29	80	
3.			Particulate Matter (Size less than 10µm) or PM10, $\mu g/m^3$	57.0	100	
4.			Particulate Matter (Size less than 2.5µm) or PM2.5, $\mu g/m^3$	39.29	60	
Remarks		Nil				
Any unusual feature observed during determination				Nil		

End of Test Report

Authorized Signatory
Kalyani Laboratories Private Limited

KALYANI LABORATORIES PVT. LTD. BBSR.

KLPL- 33428A

KALYANI LABORATORIES PVT. LTD.
Kalyani Laboratories
78/944, PAHAL, BHUBANESWAR-752101, ODISHA

TEST REPORT

Test Report No.: KLPL-TR/09/19/AAQM-339E

Issue date: 28.09.2019

Name and address of the Customer: M/s Raipur Energen Limited.
Raikheda,Block-Tilda,dist-Raipur,493224,CG.

Customer's reference: Service Order No.: 4800148522 Date-08.01.2019

Date of Sample Receipt: 23.09.2019 | **Testing Dt.:** 23.09.2019 | **Test completion Dt.:** 28.09.2019

Sample Description: Ambient Air Quality **No. of Samples:** 01

Sample Condition: Gaseous sample absorbing solutions refrigerated

Sampling Method used, if any: KLPL/SOP/ Air-06

Sl. No	Date of Sampling	Sampling Location	Parameters	Observed Value	NAAQS, 2009	Test Method
1.	19-20/09/2019	Rest Shelter. 1.5 Km from the mines in direction South East	Sulphur Dioxide (SO_2), $\mu g/m^3$	4.11	80	Guidelines for the Measurement of Ambient Air Pollutants Volume-I & II, CPCB
2.			Nitrogen Dioxide (NO_2), $\mu g/m^3$	13.26	80	
3.			Particulate Matter (Size less than 10µm) or PM10, $\mu g/m^3$	53.0	100	
4.			Particulate Matter (Size less than 2.5µm) or PM2.5, $\mu g/m^3$	34.66	60	
5.			Lead (Pb), $\mu g/m^3$	< 0.02	01	
6.			Arsenic (As), ng/m^3	< 1.0	06	
7.			Mercury (Hg), ng/m^3	< 1.0	--	
8.			Chromium (Cr), ng/m^3	< 1.0	--	
Remarks		Nil				
Any unusual feature observed during determination			Nil			

End of Test Report

Authorized Signatory
Kalyani Laboratories Private Limited

KALYANI LABORATORIES PVT. LTD. BBSR.

KLPL- 33427A

KALYANI LABORATORIES PVT. LTD.
Kalyani Laboratories
78/944, PAHAL, BHUBANESWAR-752101, ODISHA

TEST REPORT

Test Report No.: KLPL-TR/09/19/AAQM-339F

Issue date: 28.09.2019

Name and address of the Customer: M/s Raipur Energen Limited.
Raikheda,Block-Tilda,dist-Raipur,493224,CG.

Customer's reference: Service Order No.: 4800148522 Date-08.01.2019

Date of Sample Receipt: 23.09.2019 | **Testing Dt.:** 23.09.2019 | **Test completion Dt.:** 28.09.2019

Sample Description: Ambient Air Quality **No. of Samples:** 1

Sample Condition: Gaseous sample absorbing solutions refrigerated

Sampling Method used, if any: KLPL/SOP/ Air-06

Sl. No	Date of Sampling	Sampling Location	Parameters	Observed Value	NAAQS, 2009	Test Method
1.	18-19/09/2019	Khinda village. 3 Km from the mines in direction of South East	Sulphur Dioxide (SO_2), $\mu g/m^3$	6.44	80	Guidelines for the Measurement of Ambient Air Pollutants Volume-I & II, CPCB
2.			Nitrogen Dioxide (NO_2), $\mu g/m^3$	12.92	80	
3.			Particulate Matter (Size less than 10µm) or PM10, $\mu g/m^3$	58.0	100	
4.			Particulate Matter (Size less than 2.5µm) or PM2.5, $\mu g/m^3$	36.75	60	
5.			Lead (Pb), $\mu g/m^3$	< 0.02	01	
6.			Arsenic (As), ng/m^3	< 1.0	06	
7.			Mercury (Hg), ng/m^3	< 1.0	--	
8.			Chromium (Cr), ng/m^3	< 1.0	--	
Remarks			Nil			
Any unusual feature observed during determination			Nil			

End of Test Report

Authorized Signatory
Kalyani Laboratories Private Limited

KALYANI LABORATORIES PVT. LTD. BBSR.

KLPL- 33426A

KALYANI LABORATORIES PVT. LTD.
Kalyani Laboratories
78/944, PAHAL, BHUBANESWAR-752101, ODISHA

TEST REPORT

Test Report No.: KLPL-TR/09/19/AAQM-339G

Issue date: 28.09.2019

Name and address of the Customer: M/s Raipur Energen Limited.
Raikheda,Block-Tilda,dist-Raipur,493224,CG.

Customer's reference: Service Order No.: 4800148522 Date-08.01.2019

Date of Sample Receipt: 23.09.2019 | **Testing Dt.:** 23.09.2019 | **Test completion Dt.:** 28.09.2019

Sample Description: Ambient Air Quality **No. of Samples:** 1

Sample Condition: Gaseous sample absorbing solutions refrigerated

Sampling Method used, if any: KLPL/SOP/ Air-06

Sl. No	Date of Sampling	Sampling Location	Parameters	Observed Value	NAAQS, 2009	Test Method
1.	19-20/09/2019	Babu Khinda 3.5 Km from the mines in direction of North East	Sulphur Dioxide (SO_2), µg/m^3	5.44	80	Guidelines for the Measurement of Ambient Air Pollutants Volume-I & II, CPCB
2.			Nitrogen Dioxide (NO_2), µg/m^3	14.96	80	
3.			Particulate Matter (Size less than 10µm) or PM10, µg/m^3	43.0	100	
4.			Particulate Matter (Size less than 2.5µm) or PM2.5, µg/m^3	26.76	60	
5.			Lead (Pb), µg/m^3	< 0.02	01	
6.			Arsenic (As), ng/m^3	< 1.0	06	
7.			Mercury (Hg), ng/m^3	< 1.0	--	
8.			Chromium (Cr), ng/m^3	< 1.0	--	
Remarks		Nil				
Any unusual feature observed during determination				Nil		

End of Test Report

Authorized Signatory
Kalyani Laboratories Private Limited

KALYANI LABORATORIES PVT. LTD. BBSR.

KLPL- 33411A

KALYANI LABORATORIES PVT. LTD.
Kalyani Laboratories
78/944, PAHAL, BHUBANESWAR-752101, ODISHA

TEST REPORT

Test Report No.: KLPL-TR/09/19/AAQM-339H

Issue date: 28.09.2019

Name and address of the Customer: M/s Raipur Energen Limited.
Raikheda,Block-Tilda,dist-Raipur,493224,CG

Customer's reference: Service Order No.: 4800148522 Date-08.01.2019

Date of Sample Receipt: 23.09.2019 | **Testing Dt.:** 23.09.2019 | **Test completion Dt.:** 25.09.2019

Sample Description: Ambient Air Quality **No. of Samples:** 1
Sampling Point. : Downwind direction of Talabira 1 mines

Sample Condition: Gaseous sample absorbing solutions refrigerated

Sampling Method used, if any: KLPL/SOP/ Air-06

Sl. No	Date of Sampling	Sampling Location	Parameters	Observed Value	Test Method
1.	20/09/2019	A1-Downwind point of Talabira-1 mine area	Total VOC (µg/m³)	< 0.001	Solvent Extraction followed by GC analysis.
2.			PAH (µg/m³)	< 0.001	
Remarks		Nil			
Any unusual feature observed during determination				Nil	

End of Test Report

Authorized Signatory
Kalyani Laboratories Private Limited

KALYANI LABORATORIES PVT. LTD. BBSR.

KLPL- 33491A

KALYANI LABORATORIES PVT. LTD.
Kalyani Laboratories
78/944, PAHAL, BHUBANESWAR-752101, ODISHA

TEST REPORT

Test Report No.: KLPL-TR/09/19/NOISE(339I – 339O)

Issue date: 28.09.2019

Name and address of the Customer: M/s Raipur Energen Limited.
Raikheda,Block-Tilda,dist-Raipur,493224,CG

Customer's reference: Service Order No.: 4800148522 Date-08.01.2019

Date of Sample Receipt: Not Applicable	**Testing Dt.:** Not Applicable	**Test completion Dt.:** Not Applicable

Sample Description: Noise Level **No. of Samples:** 07

Sample Condition: NA

Sampling Method used, if any: KLPL/SOP/ Air-06

SL. NO	DATE OF MONITORING	SAMPLING LOCATION	NOISE LEVEL IN dB(A) LEQ, DAY TIME (6.00AM TO 10.00PM)	NOISE LEVEL IN dB(A) LEQ, NIGHT TIME (10.00 PM to 6.00 AM)
1.	18.09.2019	Near Weigh Bridge	57.5	42.0
2.	17.09.2019	Near Petrol Pump	55.8	42.2
3.	20.09.2019	In front of Mining Office	59.0	50.0
4.	19.09.2019	Rest Shelter	55.2	41.8
5.	18.09.2019	Khinda Village	50.7	40.1
6.	19.09.2019	Babu Khinda	49.5	39.6
7.	17.09.2019	R & R Colony	47.6	41.0
	Standard as per Noise Rule, 2000 (Industrial Area)		75.0	70.0
	Standard as per Noise Rule, 2000 (Residental Area)		55.0	45.0
Remarks:		Nil		
Any unusual feature observed during determination			Nil	

End of Test Report

Authorized Signatory
Kalyani Laboratories Private Limited

KALYANI LABORATORIES PVT. LTD. BBSR.

KLPL- 33490A

KALYANI LABORATORIES PVT. LTD.
Kalyani Laboratories
78/944, PAHAL, BHUBANESWAR-752101, ODISHA

TEST REPORT

Test Report No.: KLPL-TR/09/19/S-1410
Issue Date: 28.09.2019
Name and address of the Customer: M/s Raipur Energen Limited.
Raikheda,Block-Tilda,dist-Raipur,493224,CG
Customer's reference: Service Order No.: 4800148522 Date-08.01.2019
Date of sampling: 21.09.2019
Date of Sample Receipt: 23.09.2019 **Testing Dt.:** 23.09.2019 **Test completion Dt:** 28.09.2019
Sample Description: Surface Water **Place of collection:** Mines Pond Water

Sample Condition: Sealed plastic and sterilized glass Bottle **No. of Samples:** 01
Sampling Method used, if any: KLPL/SOP/Chem-28

Sl. No	Parameters	Results	Units	Standards as per IS-2296 class-"C"	Test Methods
1.	Colour	< 1.0	Hazen, Max	300	IS 3025 (Part 4:1983 RA 2012
2.	Total Suspended Solid	40	mg/l	--	APHA-22nd Edition (2540 D)
3.	*p*H value	8.1	--	6.5-8.5	IS 3025 (Part 11):1983 RA 2012
4.	Electrical Conductivity	0.425	ms/cm	--	APHA-22nd Edition (2510 A)
5.	Turbidity	2.5	NTU, max	--	IS 3025 (Part 10):1984 RA 2006
6.	Total dissolved solids	252	mg/l, max	1500	IS 3025 (Part 16):1984 RA 2006
7.	Chemical Oxygen Demand	< 5.0	mg/l, max	--	APHA-22nd Edition (5220 B)
8.	Total Organic Carbon	< 5.0	mg/l, max	--	APHA-22ND Eds.
9.	Total Kjeldal Nitrogen	2.24	mg/l, max	--	APHA-22nd Edition ($4500\text{-}N_{org}$-B)
10.	Chloride (as Cl)	32	mg/l, max	--	IS 3025 (Part 32):1988 RA 2009
11.	Copper (as Cu)	< 0.01	mg/l, max	1.5	IS 3025 (Part 42):1992 RA 2009
12.	Fluoride (as F)	< 0.05	mg/l, max	1.5	IS 3025 (Part 60):2008
13.	Iron (as Fe)	1.95	mg/l, max	50	IS 3025 (Part 53):2003 RA 2009
14.	Manganese (as Mn)	< 0.1	mg/l, max	--	IS 3025 (Part 59):2006 RA 2012
15.	Nitrate (as NO_3)	3.6	mg/l, max	50	IS 3025 (Part 34):1988 RA 2009
16.	Sulphate (as SO_4)	42	mg/l, max	--	IS 3025 (Part 24):1986 RA 2009
17.	Total alkalinity	40	mg/l, max	--	IS 3025 (Part 23):1986

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TEST REPORT

	(as $CaCO_3$)				RA 2009
18.	Total hardness (as $CaCO_3$)	132	mg/l, max	--	IS 3025 (Part 21):2009
19.	Zinc (as Zn)	0.048	mg/l, max	15	IS 3025 (Part 49):1994 RA 2009
TOXIC SUBSTANCES					
20.	Cadmium (as Cd)	< 0.001	mg/l, max	0.01	IS 3025 (Part 41):1992 RA 2009
21.	Cyanide (as CN)	< 0.01	mg/l, max	0.05	IS 3025 (Part 27):1986 RA 2009
22.	Lead (as Pb)	< 0.01	mg/l, max	0.1	IS 3025 (Part 47):1994 RA 2009
23.	Mercury (as Hg)	< 0.001	mg/l, max	--	IS 3025 (Part 48):1994 RA 2009
24.	Nickel (as Ni)	< 0.01	mg/l, max	--	IS 3025 (Part 54):2003 RA 2009
25.	Biochemical Oxygen Demand	< 1.0	mg/l, max	3.0	APHA-22nd Edition - 2012 (5210 B)
26.	Total arsenic (as As)	< 0.001	mg/l, max	0.2	IS 3025 (Part 37): 1988 RA 2009
27.	Total chromium (as Cr)	< 0.01	mg/l, max	--	IS 3025 (Part 52): 2003 RA 2009
28.	Dissolved Oxygen	6.8	mg/l,min	4.0	APHA-22nd Edition (4500-O-C)
Remarks: Nil					
Any unusual feature observed during determination					Nil

End of Test Report

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78/944, PAHAL, BHUBANESWAR-752101, ODISHA

TEST REPORT

Test Report No.: KLPL-TR/09/19/WATER-1411
Issue Date: 28.09.2019
Name and address of the Customer: M/s Raipur Energen Limited.
Raikheda,Block-Tilda,dist-Raipur,493224,CG
Customer's reference: Service Order No.: 4800148522 Date-08.01.2019
Date of sampling: 21.09.2019
Date of Sample Receipt: 23.09.2019 **Testing Dt.:** 23.09.2019 **Test completion Dt:** 28.09.2019
Sample Description: Ground Water **Place of collection:** R & R COLONY OPEN WELL (Purushotam Meher)

Sample Condition: Sealed plastic and sterilized glass Bottle **No. of Samples: 01**
Sampling Method used, if any: KLPL/SOP/Chem-28

Sl. No	Parameters	Results	Units	Acceptable Limit (IS: 10500:2012)	Test Methods
1.	Colour	< 1.0	Hazen, Max	5	IS 3025 (Part 4:1983 RA 2012
2.	Total Suspended Solid	38	mg/l, max	--	APHA-22nd Edition (2540 D)
3.	*p*H value	7.6	--	6.5-8.5	IS 3025 (Part 11):1983 RA 2012
4.	Ground Water Level	5.28	Meter	--	--
5.	Electrical Conductivity	0.389	ms/cm	--	APHA-22nd Edition (2510 A)
6.	Turbidity	0.6	NTU, Max	1.0	IS 3025 (Part 10):1984 RA 2006
7.	Total dissolved solids	216	mg/l, max	500	IS 3025 (Part 16):1984 RA 2006
8.	Chemical Oxygen Demand	< 5.0	mg/l, max	--	APHA-22nd Edition (5220 B)
9.	Total Kjeldal Nitrogen	1.68	mg/l, max	--	APHA-22nd Edition (4500-N_{org}-B)
10.	Chloride (as Cl)	30	mg/l, max	250	IS 3025 (Part 32):1988 RA 2009
11.	Copper (as Cu)	< 0.02	mg/l, max	0.05	IS 3025 (Part 42):1992 RA 2009
12.	Fluoride (as F)	0.20	mg/l, max	1.0	IS 3025 (Part 60):2008
13.	Iron (as Fe)	< 0.05	mg/l, max	1.0	IS 3025 (Part 53):2003 RA 2009
14.	Manganese (as Mn)	< 0.05	mg/l, max	0.10	IS 3025 (Part 59):2006 RA 2012
15.	Nitrate (as NO_3)	3.2	mg/l, max	45.0	IS 3025 (Part 34):1988 RA 2009
16.	Sulphate (as SO_4)	30	mg/l, max	200	IS 3025 (Part 24):1986 RA 2009
17.	Total alkalinity (as	100	mg/l, Max	200	IS 3025 (Part 23):1986

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	$CaCO_3$)				RA 2009
18.	Total hardness (as $CaCO_3$)	128	mg/l, Max	200	IS 3025 (Part 21):2009
19.	Zinc (as Zn)	0.039	mg/l, Max	5.0	IS 3025 (Part 49):1994 RA 2009
TOXIC SUBSTANCES					
20.	Cadmium (as Cd)	< 0.001	mg/l, Max	0.003	IS 3025 (Part 41):1992 RA 2009
21.	Cyanide (as CN)	< 0.01	mg/l, Max	0.05	IS 3025 (Part 27):1986 RA 2009
22.	Lead (as Pb)	< 0.005	mg/l, Max	0.01	IS 3025 (Part 47):1994 RA 2009
23.	Mercury (as Hg)	< 0.0005	mg/l, Max	0.001	IS 3025 (Part 48):1994 RA 2009
24.	Nickel (as Ni)	< 0.01	mg/l, Max	0.02	IS 3025 (Part 54):2003 RA 2009
25.	Total Pesticide	< 0.0001	mg/l, Max	0.0005	USEPA
26.	Total arsenic (as As)	< 0.001	mg/l, Max	0.01	IS 3025 (Part 37): 1988 RA 2009
27.	Total chromium (as Cr)	< 0.02	mg/l, Max	0.05	IS 3025 (Part 52): 2003 RA 2009
Remarks: Ground water level monitor manually					
Any unusual feature observed during determination				Nil	

********** End of Test Report **********

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Kalyani Laboratories
78/944, PAHAL, BHUBANESWAR-752101, ODISHA

TEST REPORT

Test Report No.: KLPL-TR/09/19/WATER-1411A
Issue Date: 28.09.2019
Name and address of the Customer: M/s Raipur Energen Limited.
Raikheda,Block-Tilda,dist-Raipur,493224,CG .
Customer's reference: Service Order No.: 4800148522 Date-08.01.2019
Date of sampling: 21.09.2019
Date of Sample Receipt: 23.09.2019 **Testing Dt.:** 23.09.2019 **Test completion Dt:** 28.09.2019
Sample Description: Ground Water **Place of collection:** Inside Mines Office

Sample Condition: Sealed plastic and sterilized glass Bottle **No. of Samples:** 01
Sampling Method used, if any: KLPL/SOP/Chem-28

Sl. No	Parameters	Results	Units	Acceptable Limit (IS: 10500:2012)	Test Methods
1.	Colour	< 1.0	Hazen, Max	5	IS 3025 (Part 4:1983 RA 2012
2.	Total Suspended Solid	44	mg/l, max	--	APHA-22nd Edition (2540 D)
3.	*p*H value	7.8	--	6.5-8.5	IS 3025 (Part 11):1983 RA 2012
4.	Ground Water Level	5.29	Meter	--	--
5.	Electrical Conductivity	0.450	ms/cm	--	APHA-22nd Edition (2510 A)
6.	Turbidity	0.9	NTU, Max	1.0	IS 3025 (Part 10):1984 RA 2006
7.	Total dissolved solids	236	mg/l, max	500	IS 3025 (Part 16):1984 RA 2006
8.	Chemical Oxygen Demand	< 5.0	mg/l, max	--	APHA-22nd Edition (5220 B)
9.	Total Kjeldal Nitrogen	1.68	mg/l, max	--	APHA-22nd Edition (4500-N_{org}-B)
10.	Chloride (as Cl)	36	mg/l, max	250	IS 3025 (Part 32):1988 RA 2009
11.	Copper (as Cu)	< 0.02	mg/l, max	0.05	IS 3025 (Part 42):1992 RA 2009
12.	Fluoride (as F)	0.25	mg/l, max	1.0	IS 3025 (Part 60):2008
13.	Iron (as Fe)	< 0.05	mg/l, max	1.0	IS 3025 (Part 53):2003 RA 2009
14.	Manganese (as Mn)	< 0.05	mg/l, max	0.10	IS 3025 (Part 59):2006 RA 2012
15.	Nitrate (as NO_3)	3.5	mg/l, max	45.0	IS 3025 (Part 34):1988 RA 2009
16.	Sulphate (as SO_4)	34	mg/l, max	200	IS 3025 (Part 24):1986 RA 2009
17.	Total alkalinity (as	110	mg/l, Max	200	IS 3025 (Part 23):1986

KLPL-33487A

	$CaCO_3$)				RA 2009
18.	Total hardness (as $CaCO_3$)	140	mg/l, Max	200	IS 3025 (Part 21):2009
19.	Zinc (as Zn)	0.042	mg/l, Max	5.0	IS 3025 (Part 49):1994 RA 2009
TOXIC SUBSTANCES					
20.	Cadmium (as Cd)	< 0.001	mg/l, Max	0.003	IS 3025 (Part 41):1992 RA 2009
21.	Cyanide (as CN)	< 0.01	mg/l, Max	0.05	IS 3025 (Part 27):1986 RA 2009
22.	Lead (as Pb)	< 0.005	mg/l, Max	0.01	IS 3025 (Part 47):1994 RA 2009
23.	Mercury (as Hg)	< 0.0005	mg/l, Max	0.001	IS 3025 (Part 48):1994 RA 2009
24.	Nickel (as Ni)	< 0.01	mg/l, Max	0.02	IS 3025 (Part 54):2003 RA 2009
25.	Total Pesticide	< 0.0001	mg/l, Max	0.0005	USEPA
26.	Total arsenic (as As)	< 0.001	mg/l, Max	0.01	IS 3025 (Part 37): 1988 RA 2009
27.	Total chromium (as Cr)	< 0.02	mg/l, Max	0.05	IS 3025 (Part 52): 2003 RA 2009
Remarks: Ground water level monitor manually (Provision for Potable Pizzometric Monitoring).					
Any unusual feature observed during determination				Nil	

End of Test Report

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ANNEXURE – 4

Land Use Analysis Report

Study Report on

"Preparation of Temporal change detection & Land-use/Land-cover Mapping of Talabira-I Coal Mine based on High-Resolution Satellite Data for the year 2015 & 2018."

Submitted

to

Raipur Energen Limited
Village- Raikheda, Block – Tilda
District- Raipur

Submitted by

IORA Ecological Solutions Pvt. Ltd.
635 – 636, GF, Lane No. 3, Westend Marg,
Garden of Five Senses Road, Saidulajab Village,
New Delhi- 110030
Email: info@ioraecological.com

Table of Contents

1.0 Introduction

The Ib valley coal mines are surrounding the Hirakund Reservoir is India's mini capital of energy comprises of one of the most important new coalmines both in terms of reserves and in terms of productions. The small-scale pocket mining activities have also used the LU/LC of this region.

The LU/LC of the area of interest is created using LISS 4 MX images of 5.8-meter resolution for the year 2015 and year 2018. The LU/LC change maps have been depicted the changes during this periods, maps are shown in Annexure –I of this report.

The Talabira-I coalmine and its surrounding area is the area of interest for the current study to assess the LU/LC and its changes due the Year 2015 and 2018 using Geospatial technology.

1.1 Objectives

The objective of this assignment is the following:

- To prepare a LU/LC and change maps from satellite images of two different dates using geospatial technology:
- Change detection analysis of Spatio-temporal sequential changes in land-use patterns aligns in 10km buffer from Talabira-I Coalmine area.

1.2 Profile of the study area

The Talabira block Coalmine is located in the southern part of the in IB valley coalmines in between Jharsuguda and Sambalpur Tehsil in Sambalpur district of Odisha. The Talabira coal Mine is confined to an area bounded by latitude 21^0 42' 58" N to 21^0 44' 37" N and longitudes 83^0 58' 51" E to 84^0 00' 39" E. As per reports the Geological block area of the Talabira-I mine is around 260 Ha while the mining lease area is nearly 160.30 Ha. The location map of Talabira-I Coalmine is shown in Figure 1.

The area is well connected through roads and railways to important business centres in Odisha like Rourkela, Jharsuguda, Sundargarh and Bhubaneswar. The physiography of the Ib valley has an undulating landscape with a minimum elevation of 200 to 350 m above the mean sea level.

2.0 Methodology

The LISS IV-MX data from Resourcesat-2 satellite image of the years of 2015 (13 March 2015) and 2018 (1 Feb 2018) temporal data were obtained from NRSC Hyderabad.

Both the images are pre-processed, ortho-rectified (geometrically corrected) and resampled in UTM projection with WGS-84 datum and WGS-84 spheroid. The study area was obtained by sub-setting the required area of 10 Km buffer from Talabira-I coal mine. Both the images were classified using the unsupervised classification method with k-mean and ISODATA cluster suitable algorithm in ERDAS Imagine v2015. The image classification accuracies have been performed on visual satellite images interpretation of object identification. Finally, the changes in various LU/LC classes are obtained by post-processing classification using image differencing method.

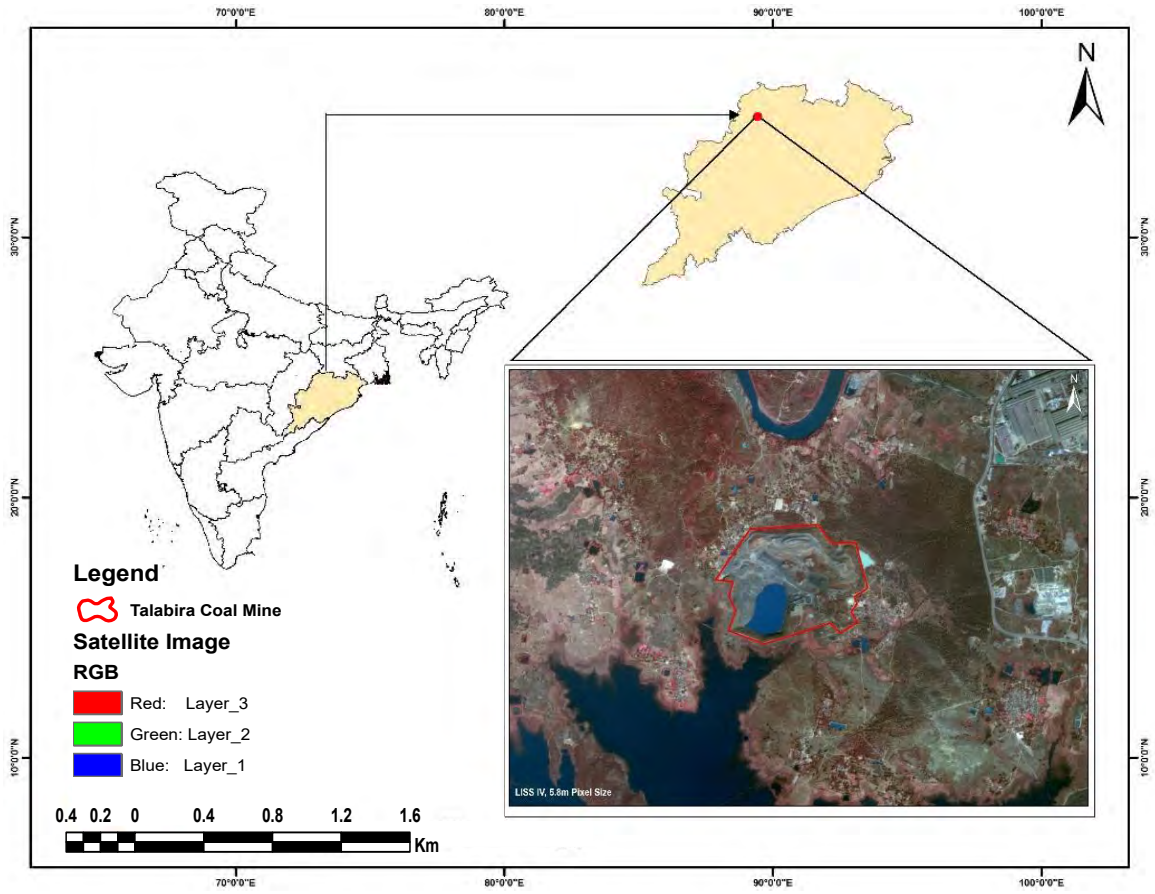


Figure 1. Location of Talabira-I Coal mine

2.1 Data used specification

The detail specification of the LISS IV MX satellite data used in the current study the given Table 1.

Table 1 Main features of satellite data used

Year	Satellite	Sensor	Spectral Bands (μ m)	Radiometric Resolution	Spatial Resolution	Date of Acquisition
2015	Resourcesat-2	LISS IV-MX	B2- Green (0.52-0.59) B3 = Red (0.62-0.68)	10 Bit	5.8 m	13-Mar-15

			B4 = NIR (0.77-0.86)			
2018	Resourcesat-2	LISS IV-MX	B2- Green (0.52-0.59) B3 = Red (0.62-0.68) B4 = NIR (0.77-0.86)	10 Bit	5.8 m	01-Feb-18

2.2 Data pre-processing

The adopted satellite image scenes had been normalised to each other by taking some necessary digital image enhancement and interpretation techniques of the raw images. The radiometric correction, like contrast stretching and histogram equalisation, was performed for each pixel value. The brightness value based on neighbouring pixels were applied on image data using ERDAS Imagine software.

2.3 Image classification methods

The unsupervised classification techniques have been adopted for LU/LC by capturing the information of each class based on the spectral information of the image. The entire work process is shown in figure 2. The K-mean and ISODATA algorithms were selected for clustering classified groups for the outcome classification, further refinements by splitting and merging of clusters by certain groups thresholds using cluster busting of mixed group of classes. The image interpretation, label and colour coding for define classes are done. The statistically computed random reference points are used for validating accuracies assessment through the classified outputs.

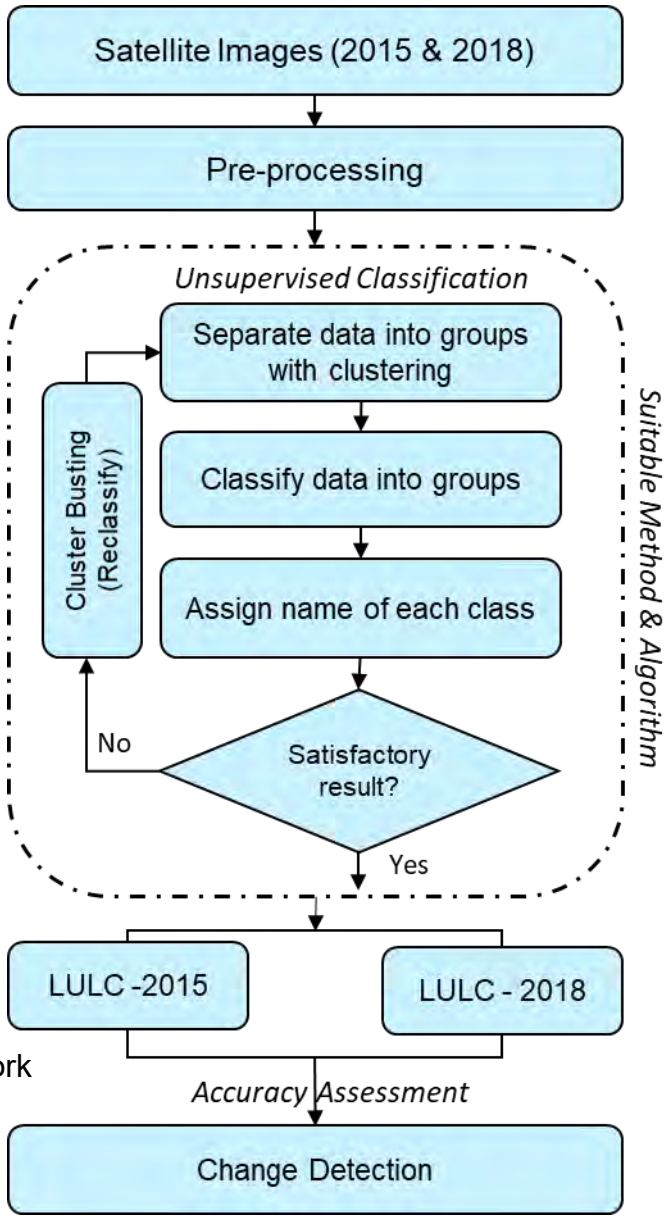


Figure 1. Work flow of adopted Methodology

2.4 Land-use/ Land-cover classification scheme

The define land-use and land-cover classes were mapped for the Talabira-I coal mine area: The description of Forest, Fallow land, Scrubland, Settlement, Mining area, Cropland, Water bodies and transport layers are shown in Table 2. The classification scheme created by NRSC is used for this classification. The fallow land (cropped area, which are kept fallow during the current year but was cultivated in the previous year) has been considered under the cropland area. The following in scheme has to be adopted for this study area.

Table 2. Land-use and land-cover classification scheme

Land Use Type	Description
Forest land	Open Forest and Plantation
Mining area	Coal Piles and Coal Gangue Piles
Fallow land	Wasteland and Fallow Land
Scrubland	Grassland, Small Trees and Shrubs
Built-up	Residential, Commercial and Services, Industrial and Transportation
Cropland	Croplands and Crop Fields (with signature of past cropland)
Water bodies	River, Lakes, Ponds, and Wetland areas
Transport network	NH, SH, DR, ODR, and Railways

3.0 Land-use/ land-cover classification

3.1 Unsupervised Classification

After the preparation of the classification scheme, the unsupervised classification technique was applied for preparation of land use/land cover maps of the study area. Through the satellite images, the independent reference points were created to check the classification accuracies and errors for each classified classes. The lower accuracy classes were also refined through re-classification (cluster busting) technique to improve the maximum accuracy of the classification results. The unsupervised classification techniques are more objective, automated and accurate in comparison of other conventional classification methods. The classified images for the year 2015 and 2018 are enclosed in Annexure I.

3.2 Accuracy assessment

The Assessment of images classification accuracy of the year 2015 and 2018 was carried out to determine the quality of the land use/land cover derived from the above images. The random points were generated from the satellite images to extract the object base signature information. The accuracy assessment was carried out using 91 points based on the visual interpretation of the referenced satellite images. The comparison of the referenced pointed was done with the classification results and performed a statistical analysis of the information for correctness using the error matrices.

The accuracy assessment error matrices and reports of the study area are shown in table number 3, 4, 5 and 6 below. The accuracy assessment is computed from classification results of 2015 and 2018 images.

Table 3. Accuracy Assessment Error Matrix of 2015 classified image

	Reference Data							
Classified Data	**Water bodies**	**Open Forest**	**Scrub land**	**Crop land**	**Built-up**	**Fallow Land**	**Mining**	**Classified Total**
Water bodies	**17**	0	0	0	0	0	0	17
Open Forest	0	**12**	1	2	0	0	0	15
Scrub land	0	0	**9**	0	1	0	0	10
Crop land	0	0	0	**15**	0	0	0	15
Built-up	0	0	0	0	**9**	0	0	9
Fallow land	0	0	0	2	0	**8**	0	10
Mining	0	0	0	0	0	0	**15**	15
Reference Total	17	12	10	19	10	8	15	**91**

Table 4. Producer's and User's Accuracy assessment of 2015 classified image

Class Name	**Reference Total**	**Classified Total**	**Number Correct**	**Producers Accuracy**	**Users Accuracy**
Waterbodies	17	17	17	100.00%	100.00%
Open Forest	12	15	12	100.00%	80.00%
Scrubland	10	10	9	90.00%	90.00%
Cropland	19	15	15	78.95%	100.00%
Built-up	10	9	9	90.00%	100.00%
Fallow Land	8	10	8	100.00%	80.00%
Mining	15	15	15	100.00%	100.00%
Total	91	91	85		
Overall Classification Accuracy = 93.41%					

Table 5. Accuracy Assessment Error Matrix of 2018 classified image

	Reference Data							
Classified Data	**Water bodies**	**Open Forest**	**Scrub land**	**Crop land**	**Built -up**	**Fallow land**	**Mining**	**Classified Total**
Waterbodies	**17**	0	0	0	0	0	0	17
Open Forest	0	**15**	0	0	0	0	0	15
Scrubland	0	0	**8**	1	0	1	0	10
Cropland	0	0	0	**14**	0	1	0	15
Built-up	0	0	0	0	**9**	0	0	9
Fallow Land	0	0	1	0	0	**8**	1	10
Mining	0	0	0	0	0	0	**15**	15
Reference Total	17	15	9	15	9	10	16	**91**

Table 6. Producer's and User's Accuracy assessment of 2015 classified image

Class Name	**Reference Total**	**Classified Total**	**Number Correct**	**Producers Accuracy**	**Users Accuracy**
Waterbodies	17	17	17	100.00%	100.00%
Open Forest	15	15	15	100.00%	100.00%
Scrub Land	10	9	8	90.00%	93.33%
Cropland	15	14	14	93.33%	93.33%
Built-up	9	9	9	100.00%	100.00%
Fallow Land	10	10	8	100.00%	80.00%
Mining	15	14	15	93.33%	93.33%
Total	91	88	86		
Overall Classification Accuracy = 94.06%					

4.0 Result and Discussion

4.1 Spatio-temporal LU/LC change assessment

The change detection analysis of map was computed in the ERDAS imaging and ArcGIS software using raster and spatial analyst tool. The classified images are characterising the differences between a pair of initial classified image (2015) and final classified images (2018). The differences between the land use and land cover class's results generated by subtracting of initial results 2015 LU/LC image from the final 2018 LU/LC image. The differencing image techniques were adopted for the assessment of change detection analysis.

The cross-matrix was computed for the assessment of change in the study area, to determine the quantum of conversions from a particular land cover class to other land cover class and their corresponding area over the evaluated period.

LU/LC class wise cross-matrix analysis results are shown in Table 7 below. As per this analysis, a thematic layer map was generated to depict the results of change detection refer to Annexure-II. The change map generated from the various classes containing the differences and combinations of "from-to" change classes.

4.2 LU/LC patterns for 2015-2018

In the Spatio-temporal change assessment of the land use and land cover patterns for March 2015 and Feb 2018, significant changes were observed in water bodies, scrubland, open forest and cropland. The overall LU/LC change shows following major changes in land use pattern:

Table 7 and Graph represent the overall net changes (increase and decrease) of major land use and land cover classes of the study area from 2015 to 2018.

Table 7. Overview of changes in LU/LC Class wise (in Sq. Km)

LU/LC Class	Area 2015	Area 2018	Net change in 2015 - 2018
Fallow Land	72.17	77.67	5.50
Built-up	11.84	14.48	2.64
Cropland	105.22	99.00	-6.22
Mining	1.66	1.56	-0.10
Open Forest	80.30	68.26	-12.04
Scrub Land	64.29	55.59	-8.69
Waterbodies	35.72	54.64	18.92

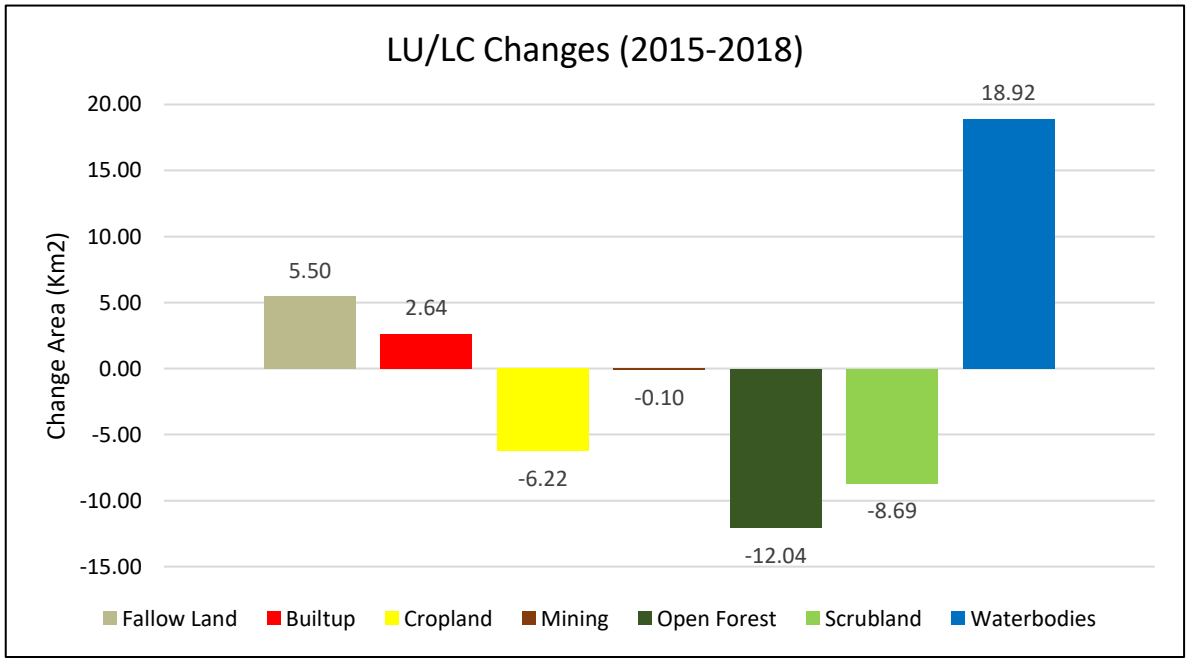


Figure 3. Representation of Overall Land Use/ Land Cover Class wise Change Patten

As per the overall analysis the open forest, scrubland and cropland are significantly decreased between the year 2015 and year 2018. It is also observed that there are significant increase in waterbodies, Fallow land and built up area.

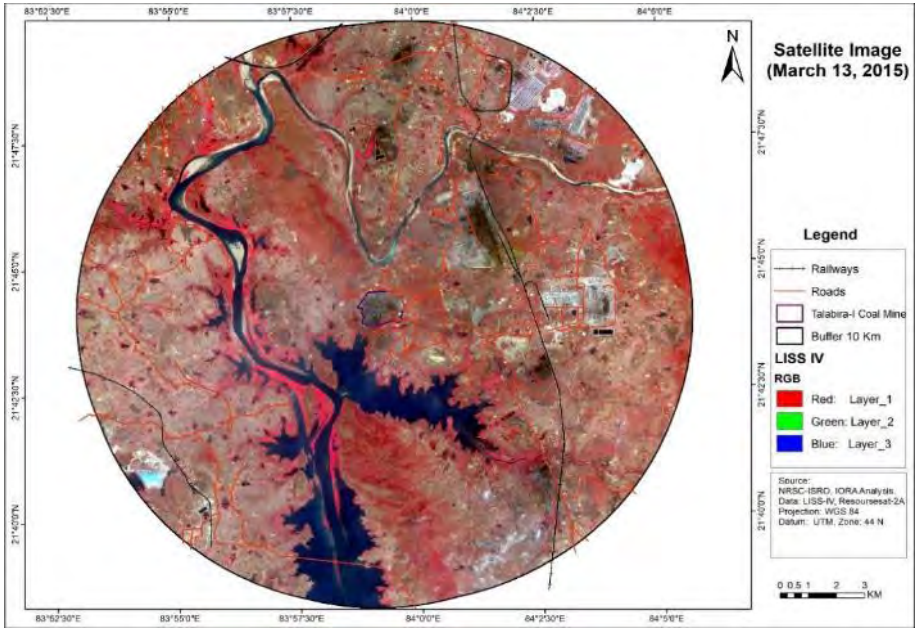
The outcomes of temporal LU/LC and LU/LC change maps of the study area has been composed through cartographic manner. The map composition of the entire area is done in two different scales namely at 1:25,000 for the entire area of interest and the leasehold area of Talabira –I coal mine on the scale of 1:5000. The maps are composed for printing at A3 paper.

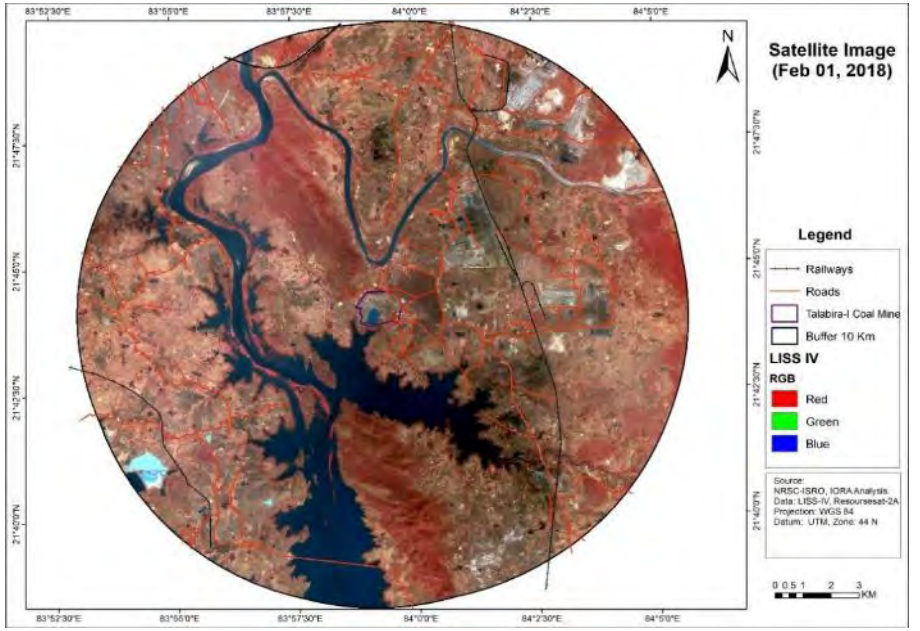
5.0 Conclusion

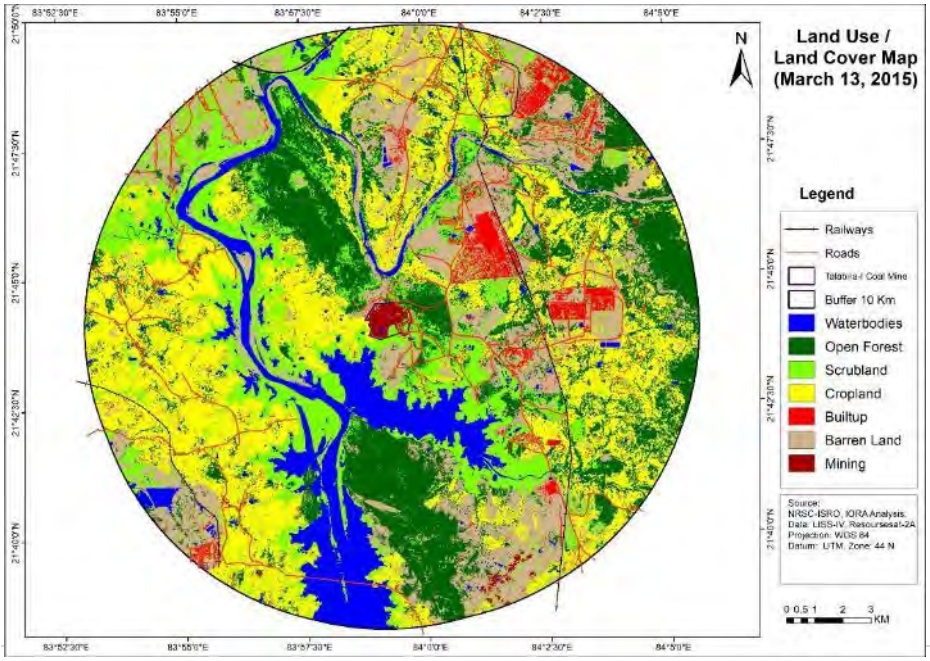
This high-resolution satellite image-based interpretation and analysis is undertaken to observe the changes in LU/LC pattern in the area of interest which is derived by putting a 10 Km buffer around the Talabira – I Coal mine area. LISS –IV high-resolution (5.8 m spatial resolution) Resourcesat-2 satellite data from 2015 and 2018 are used for interpretation and analysis. Following are the conclusion of this study:

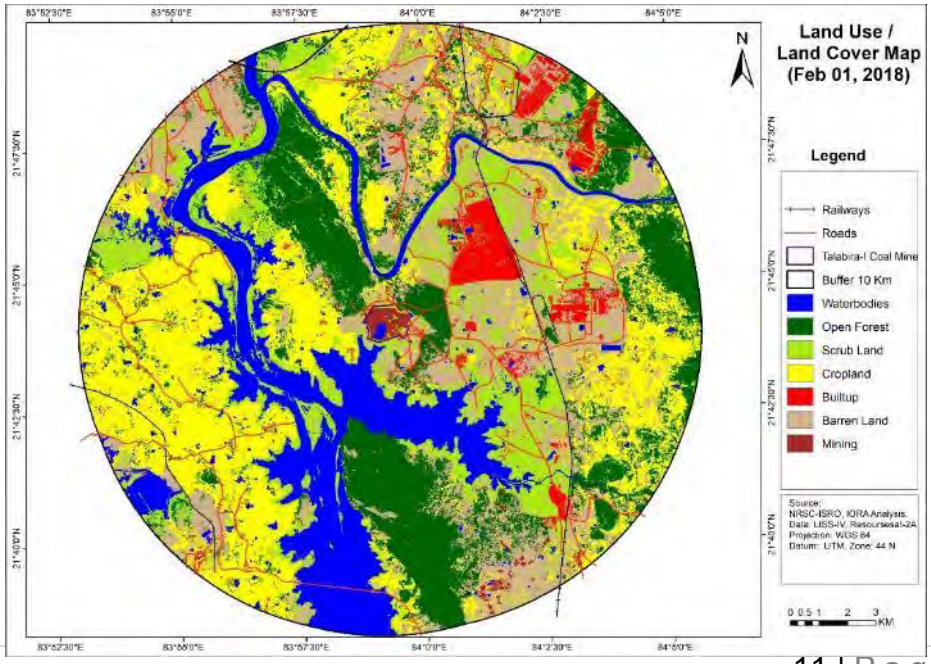
- It is observed that the Fallow land is increasing by 5.50 Sq. Km between 2015 to 2018; this increase is due to the conversion of cropland, open forest land and scrubland.
- It is observed that the water bodies are increased by 18.92 Sq. Km between 2015 to 2018; this increase is mainly due to submergence of scrubland around reserves and open forest.
- It is observed that the built-up area is increasing by 2.64 Sq. Km between 2015 to 2018; this increase is due to commercial activities and capturing scrubland for construction purposes.
- It is observed that in the mining area the water (SUMP) is increased. This may be due to no mining activities in the area in late 2017.
- It is observed that the open forest area is decreased by 12.04 Sq. Km between 2015 to 2018; this may be associated with the conversion of commercial use of the open forest and plantation.
- It is observed that cropland is decreased by 6.22 Sq. Km between 2015 to 2018; the reduction in the area of cropland is majorly due to conversion of cropland to permanent Fallow land.
- It is observed that scrubland is decreased by 8.69 Sq. Km between 2015 to 2018; the reduction in the area of scrubland is majorly due to increase in water bodies and build up area.

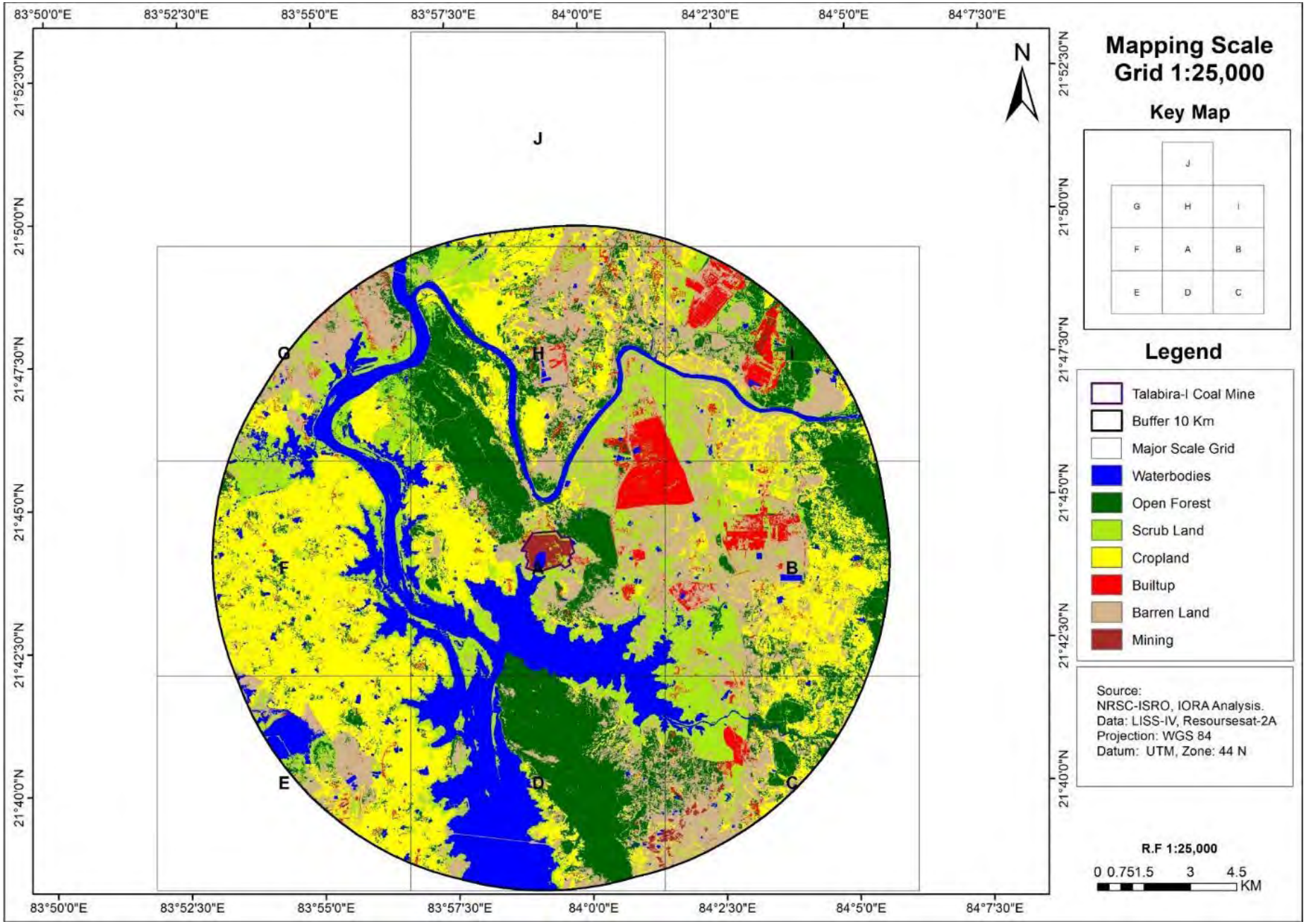
Annexure-I for reference mapping







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Mapping Scale
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Key Map
Legend
Talabira-I Coal Mine
Buffer 10 Km
Major Scale Grid
Waterbodies
Open Forest
Scrub Land
Cropland
Builtup
Barren Land
Mining
Source:
NRSC-ISRO, IORA Analysis.
Data: LISS-IV, Resoursesat-2A
Projection: WGS 84
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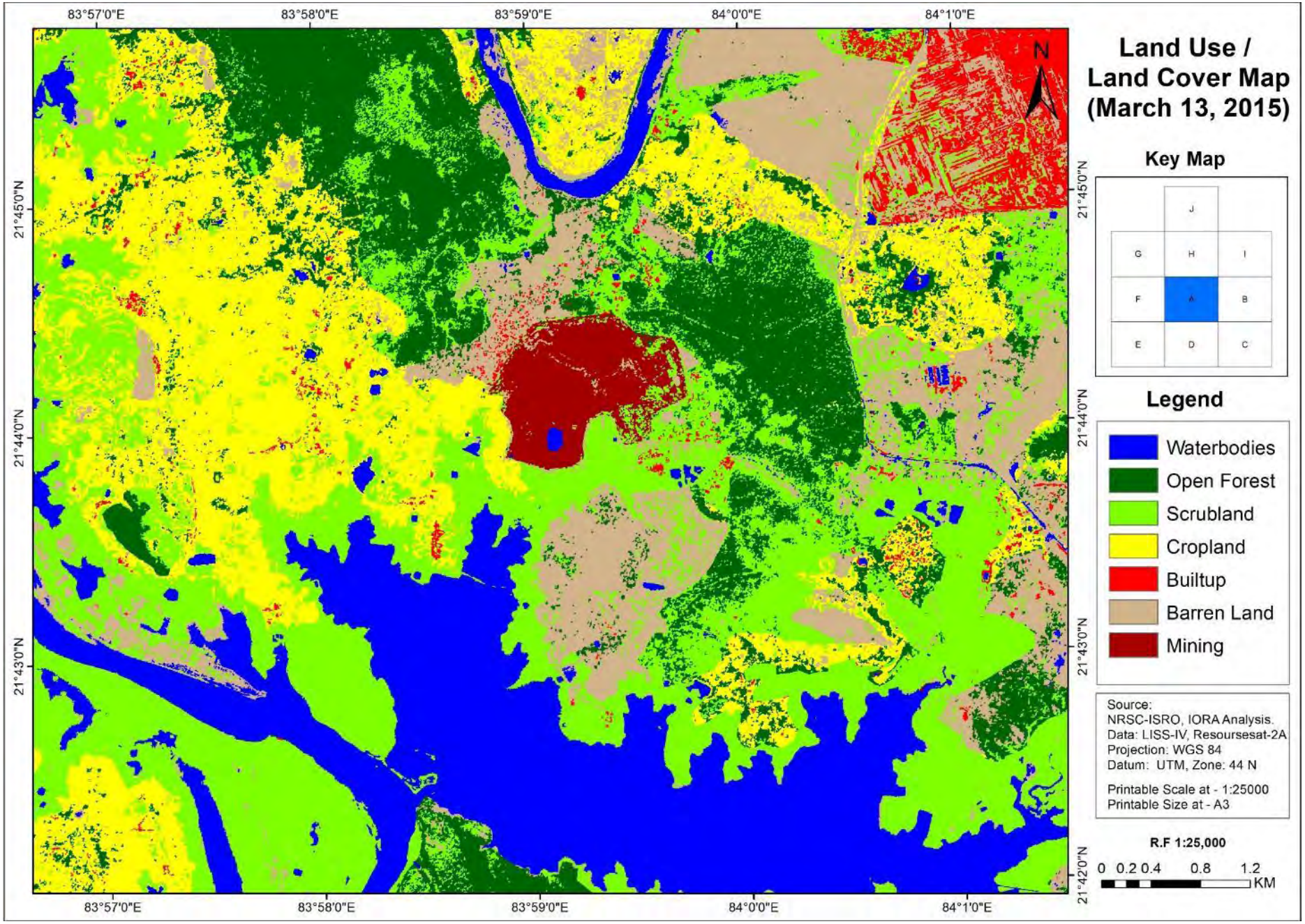
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Land Use / Land Cover Map (March 13, 2015)
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Source:
NRSC-ISRO, IORA Analysis.
Data: LISS-IV, Resoursesat-2A
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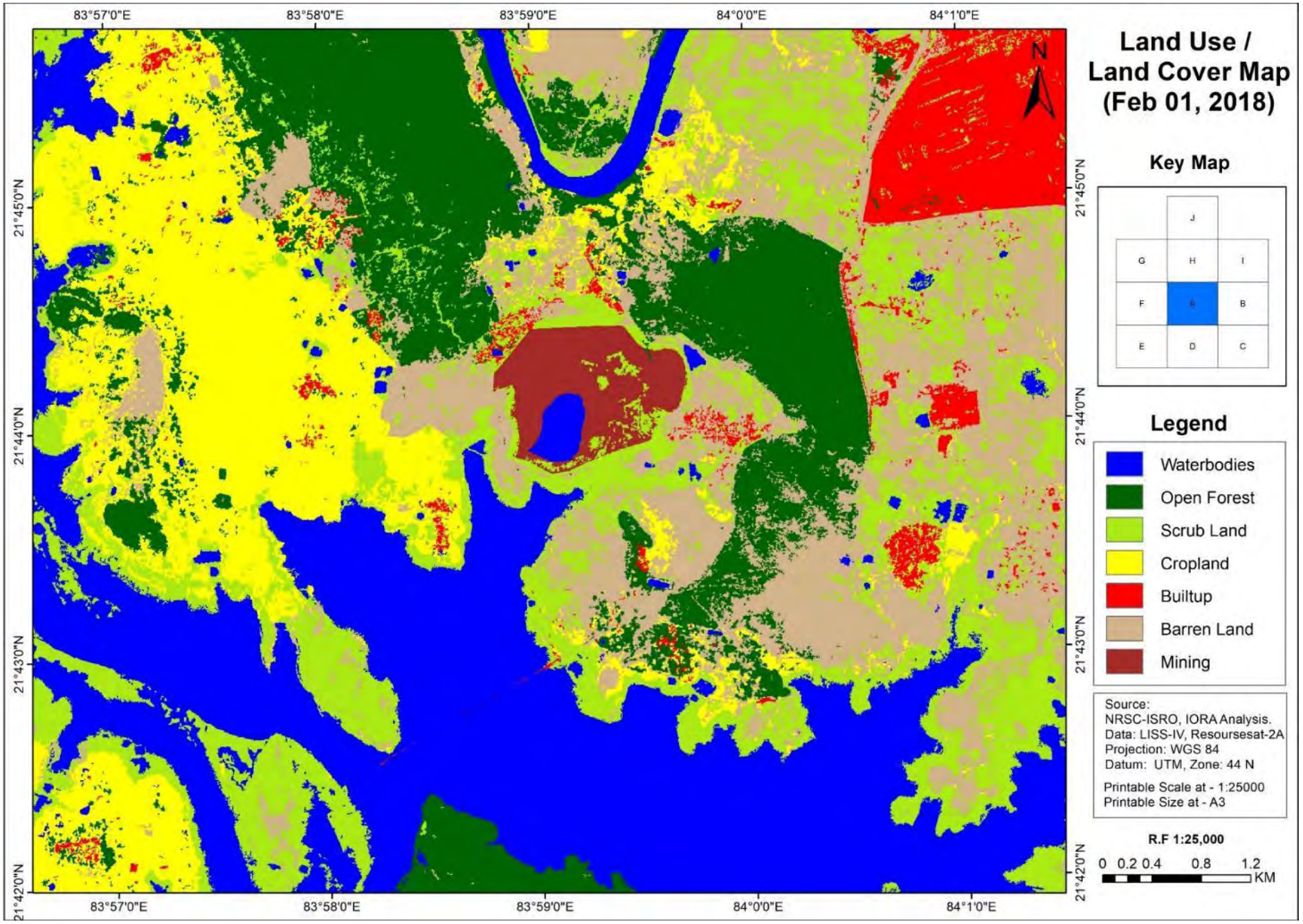
Land Use / Land Cover Map (Feb 01, 2018)
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Projection: WGS 84
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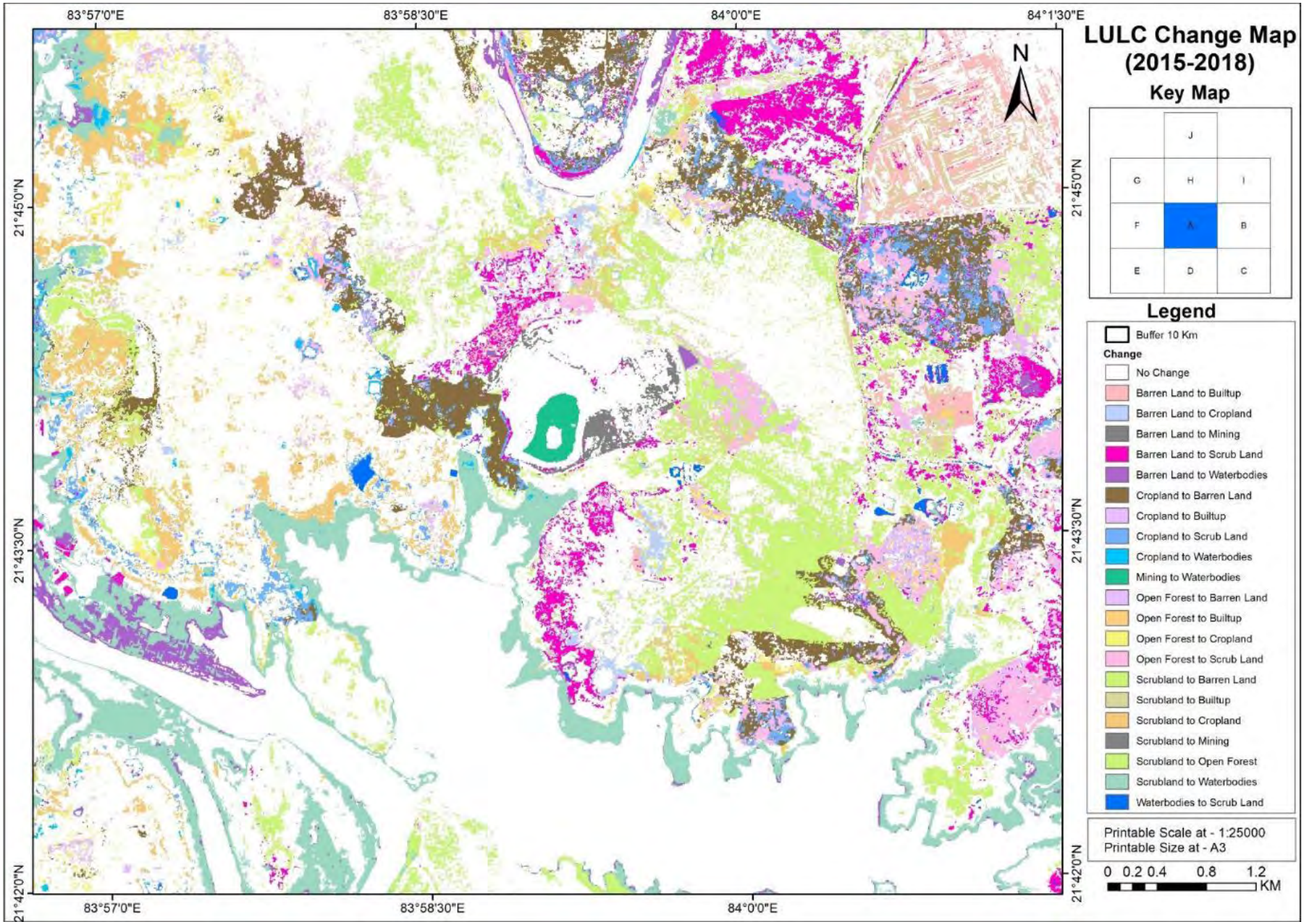
LULC Change Map
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Cropland to Waterbodies
Mining to Waterbodies
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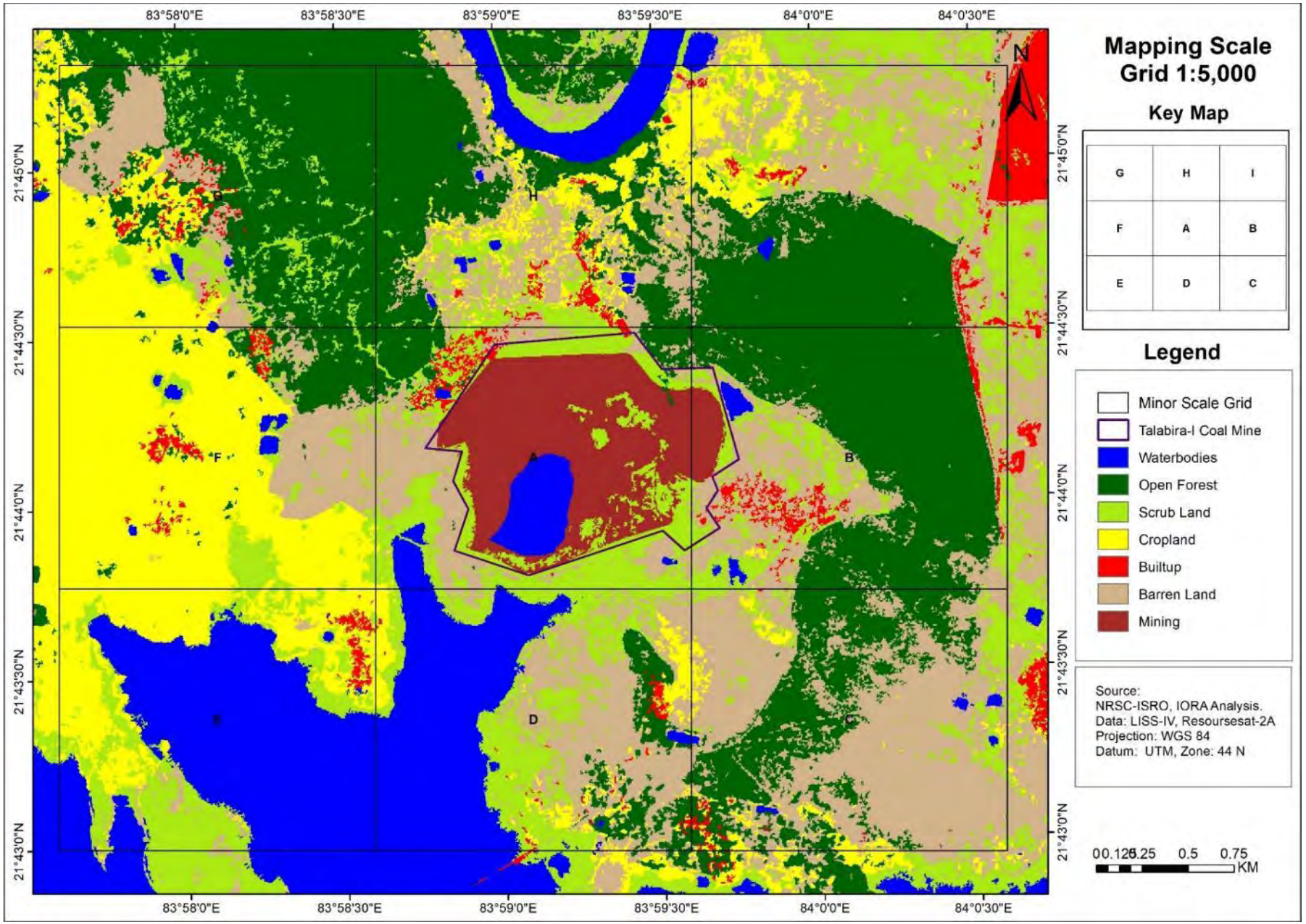
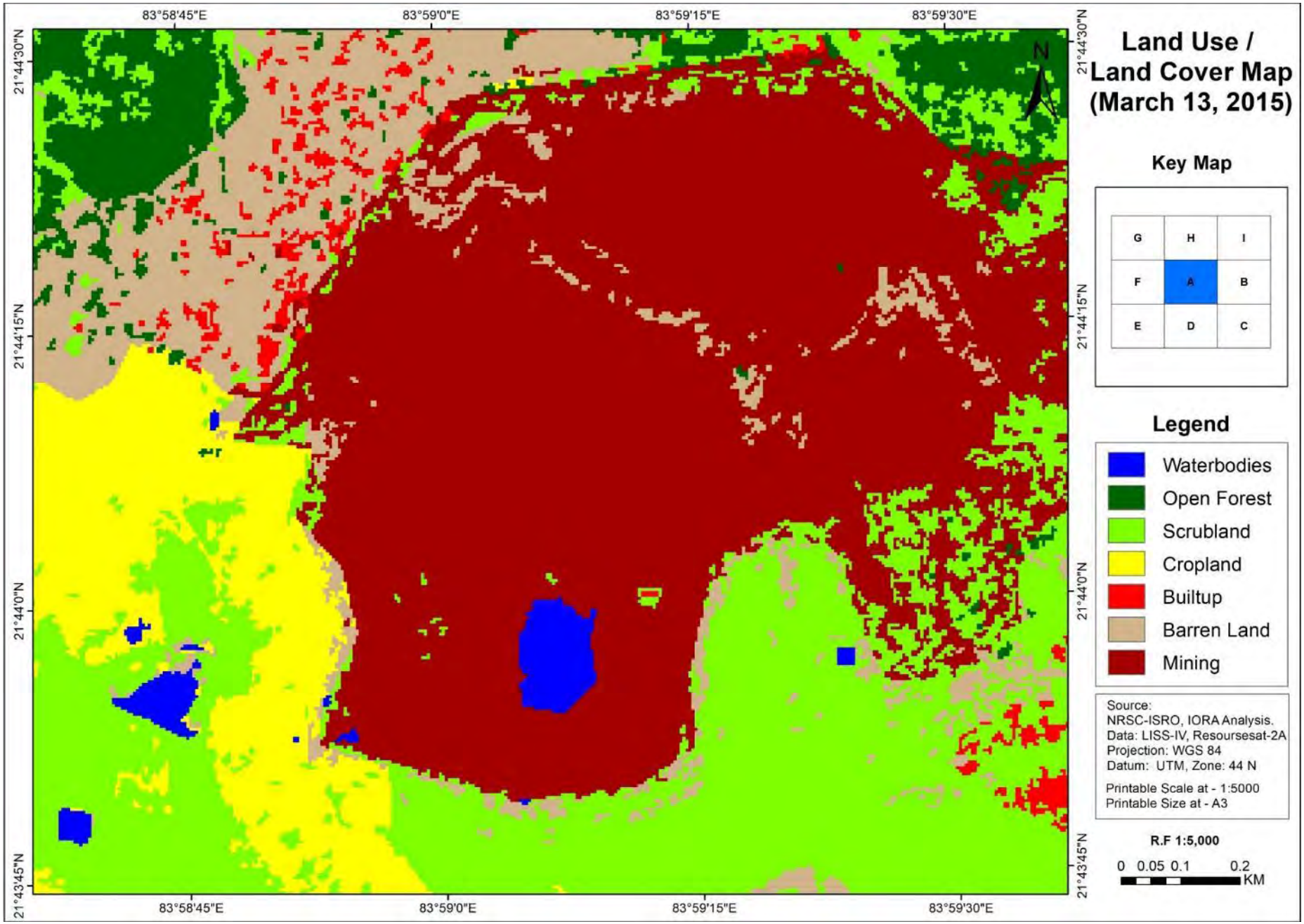
Annexure-II for reference mapping

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Land Use / Land Cover Map (March 13, 2015)
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Waterbodies
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Cropland
Builtup
Barren Land
Mining
Source:
NRSC-ISRO, IORA Analysis.
Data: LISS-IV, Resoursesat-2A
Projection: WGS 84
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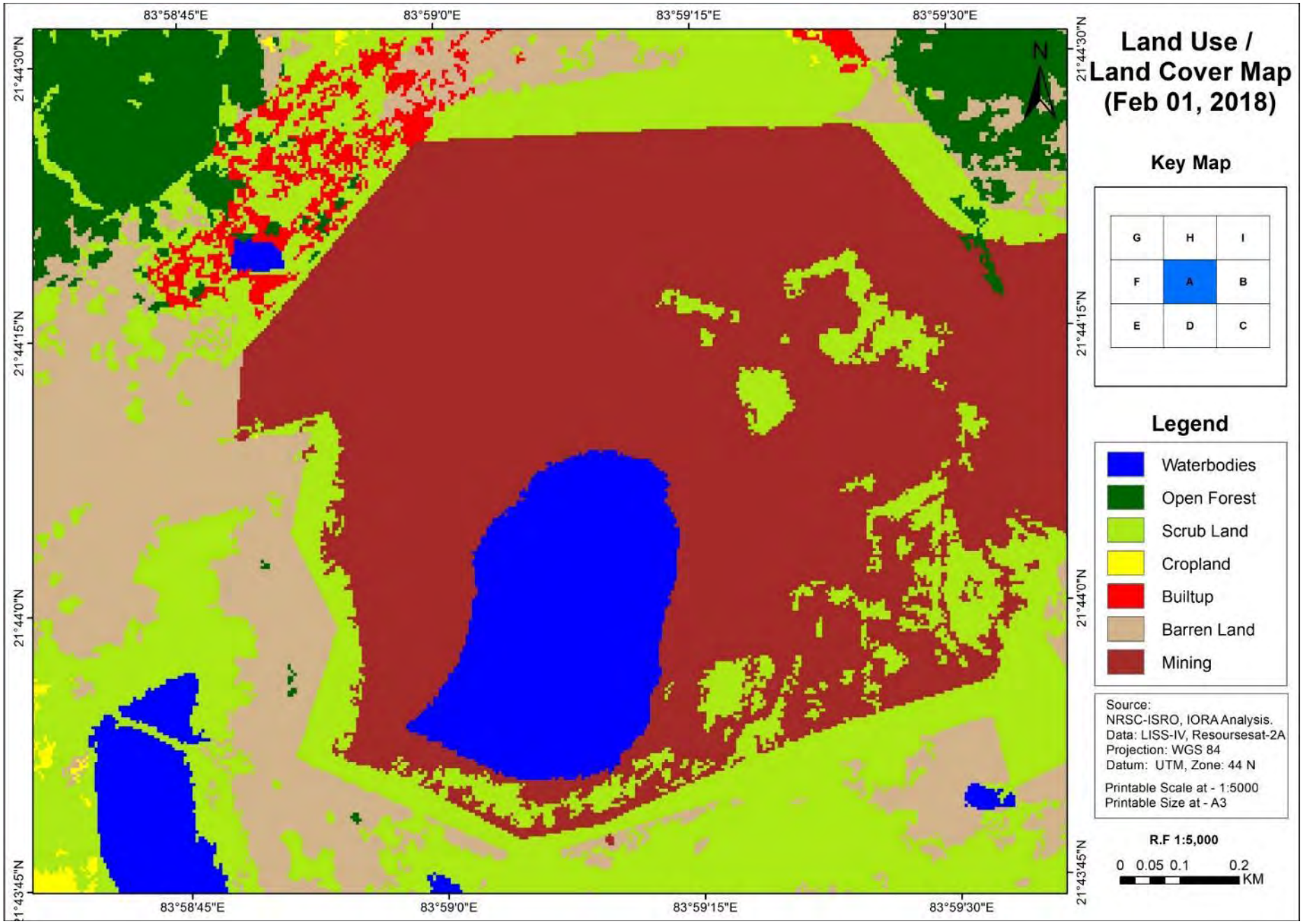
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Source:
NRSC-ISRO, IORA Analysis.
Data: LISS-IV, Resoursesat-2A
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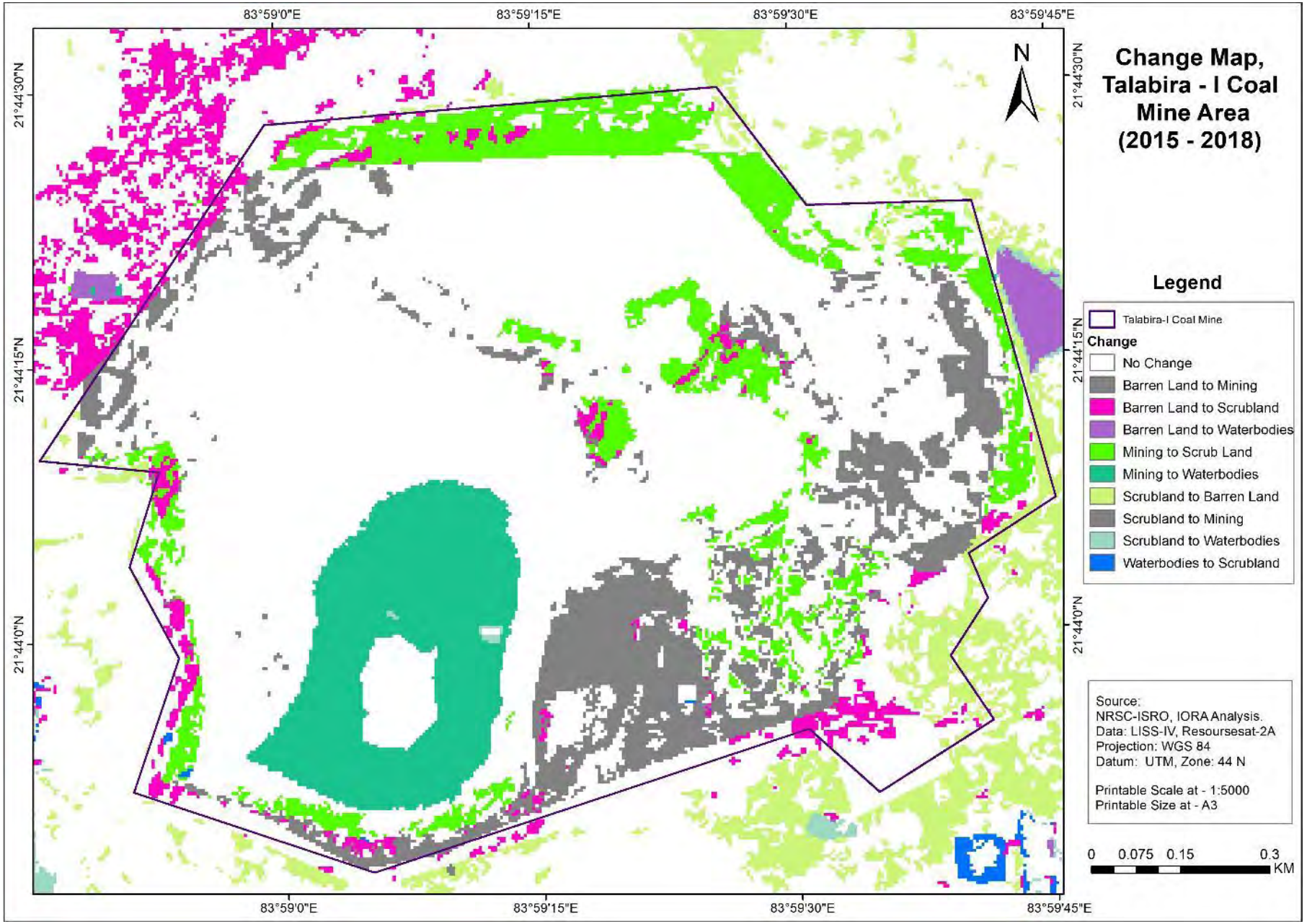
Change Map,
Talabira - I Coal
Mine Area
(2015 - 2018)
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Talabira-I Coal Mine
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Barren Land to Scrubland
Barren Land to Waterbodies
Mining to Scrub Land
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Scrubland to Barren Land
Scrubland to Mining
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Waterbodies to Scrubland
Source:
NRSC-ISRO, IORA Analysis.
Data: LISS-IV, Resoursesat-2A
Projection: WGS 84
Datum: UTM, Zone: 44 N
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ANNEXURE – 5

Socio-Economic development

Study Report on Preliminary Assessment of

Socio-Economic development of Villages in Study Area of Talabira-1 Mine in District Sambalpur, Odisha

Allotted for captive use of coal for

THERMAL POWER PLANT OF RAIPUR ENERGEN LIMITED

(Erstwhile GMR Chhattisgarh Energy Limited)

adani

A Subsidiary of Adani Power limited

(For EC compliance Report of April- Sept 2019)

Contents

List of Figures

1.1 Introduction

Minerals are one of the most viable resources for the development of nation. One of such resources is coal, coal can be used in many industries such as thermal power plant, cement industries, steel-manufacturing industries etc. Coal mining acts as an active agent for the economic development of many countries including India. Mining is responsible for viable economic development of a region. However, at the same time it fails to bring equality among the project-affected communities.

Mining has considered as one of the necessary evils of the modern world, which provides the materials required to sustain quality of life. While improving the quality of life and giving an impulse to economic development, it has also brought in its wake, a notable impact on the environment as well as socio-economic conditions of local people.

The economy of Odisha is witnessing unprecedented investment, both domestic and foreign and the state holds that promise of becoming one of India's major manufacturing hubs in the near future. A whopping US$50 billion is expected to be invested in the state for building steel and aluminum industries, power projects, ports, and other infrastructure. If things go as planned in Odisha, the state could emerge as one of the most significant FDI destinations in the world, rivaling Shenzhen in china. During the year 2009, despite the worldwide economic slowdown, Odisha stood next only to Gujarat in India Inc.'s investment plans. Vast deposits of minerals such as coal, iron-ore, manganese ore, bauxite and chromite in the State, has coupled with an industry friendly policy atmosphere offered by the state have resulted in the recent influx off corporate investments into Odisha.

Through an industry friendly policy support to corporate houses, the Government of Odisha aims to leverage-out large-scale employments and revenue that are generated because of various mining and industrial projects for the development of people in the State. In addition, the state has put in place the Odisha R&R Policy (2006) for proper and effective resettlement and rehabilitation of those families who get displaced and affected as a result of acquisition of their lands. The policy is widely acclaimed to be the most liberal one in the country. Despite these factors, mounting resistance from people against dispossession of lands owned by them; in addition, scores of people are independent on Government land for remains to be one of the key challenges before the

administration, and as some projects involving large investments are stalled, uncertainties are looming large.

1.1.1 Location accessibility

The surface mining, which is also known as open cast mining or quarrying, is easier. Open cast or surface mining includes area strip, contour strip and mountain top removal. The surface mining is, in general, an activity that can provoke a quite intense environmental degradation, which tends to a strong disturbing effect in the landscape because it requires the removal of the vegetation, soil and rocks that are above the mineral deposits.

Talabira-1 coal block is a part of IB valley coalfield, which is an elongated strip of Gondwana sediment spread over an area of 1,375 sq. km in Sambalpur and Sundergarh district of Odisha state. The leasehold is spread over an area of 170.305ha.

Talabira-1 Coal block-1 is an open cast mine, which is situated in Khinda village of Tana Katerbaga, Taluk Katerbaga, Tehsil Rengali of Sambalpur district in the state of Odisha. The nearest railway station is Lapanga, located at about 6 km from the mine, in Jharsuguda-Sambalpur branch line of SE railway. The state highway-10 is passing at a distance of about 2.5 km from the coal block and connected from the mine by metaled road.

1.1.2 Mining Plan

Mining Plan for a captive production with a capacity of 0.4 MTPA was approved by Ministry of Coal, Government of India (GoI), in the late 1998 vide letter no. 13016/II/96 CA dated 10 December 1998. This block was earlier allocated to M/s Hindalco Industries Limited vide letter no.16/11/96-CA dated 13th January 1999, to meet their earlier coal requirement of its power plant, which was located at Hirakud, Sambalpur District, Odisha State. Subsequently, their mining plan was revised with reduction in the leasehold boundary by MoC, GOI, approved this plan for reduced lease area of 170.305 ha in the year 2001. The mining plan was again revised for increasing the production to 1.5 MTPA and was approved by MoC, GoI in the year 2006. Coal production commenced from the year 2003 and continued up to March 2014 by M/s Hindalco.

M/s Hindalco carried out further exploration and the mining plan was revised for modification in resources with inclusion of three IB seams and for increasing the production capacity to three

MTPA. This revision- 2 of Mining Plan (titled Mining Plan 2nd Revision) was approved vide letter no.13016/8/2006-CA-I, dated 3th /4th February 2010.

1.1.3 Operationalization of Talabira-1 Coal Mine

The coal block was re-allocated in the year 2014 and vested with M/s Raipur Energen Limited (erstwhile, GMR Chhattisgarh Energy Limited) through auction vide Vesting Order No. 104/2/2015/NA dated 23rd March 2015 and corrigendum dated June 2nd, 2015. REL commenced the mining operation from June 2015 until November 2017. After completion of production target for Financial Year 2017-18 and expiry of mine plan from 1 April 2018, all mining activities stopped with effect from 1 April 2018.

No coal production was there from April' 2018 to till date from Talabira-1 coal mine. In addition, M/s Raipur Energen limited now handles this coal block, which is subsidiary company of Adani Power Limited.

1.1.4 Block boundaries

The block covering an area of 2.06 sq. km bounded on S, SE, SW sides by backwaters of Hirakud reservoir, on NW by Talabira village, on the North by Khinda village and on the East is village forest.

The drainage of the block is by Bhedan River running almost along the E-W direction. The block falls between latitudes 21042'58"; 21044'37": (N) and longitude 83'58'51"; 84'00'39" (E).

The lease area is 170.305ha.

1.1.4.1 Study area

The study area constitutes 8 villages (Talabira, Nua Khinda, Purana Khinda, Lapanga, Bhudiapalli, Matul Camp, Behara Munda and Mundapara) in 10 Km radius of Talabira-1 mine as per EC condition no. 'XX' and other villages also inhabited in 10Km radius area around Talabira-1 mine. The region as popularly known for forest and Hirakud dam, which spread over the region. The region comprise with coal at shallow depth and attract the people for coal mining.

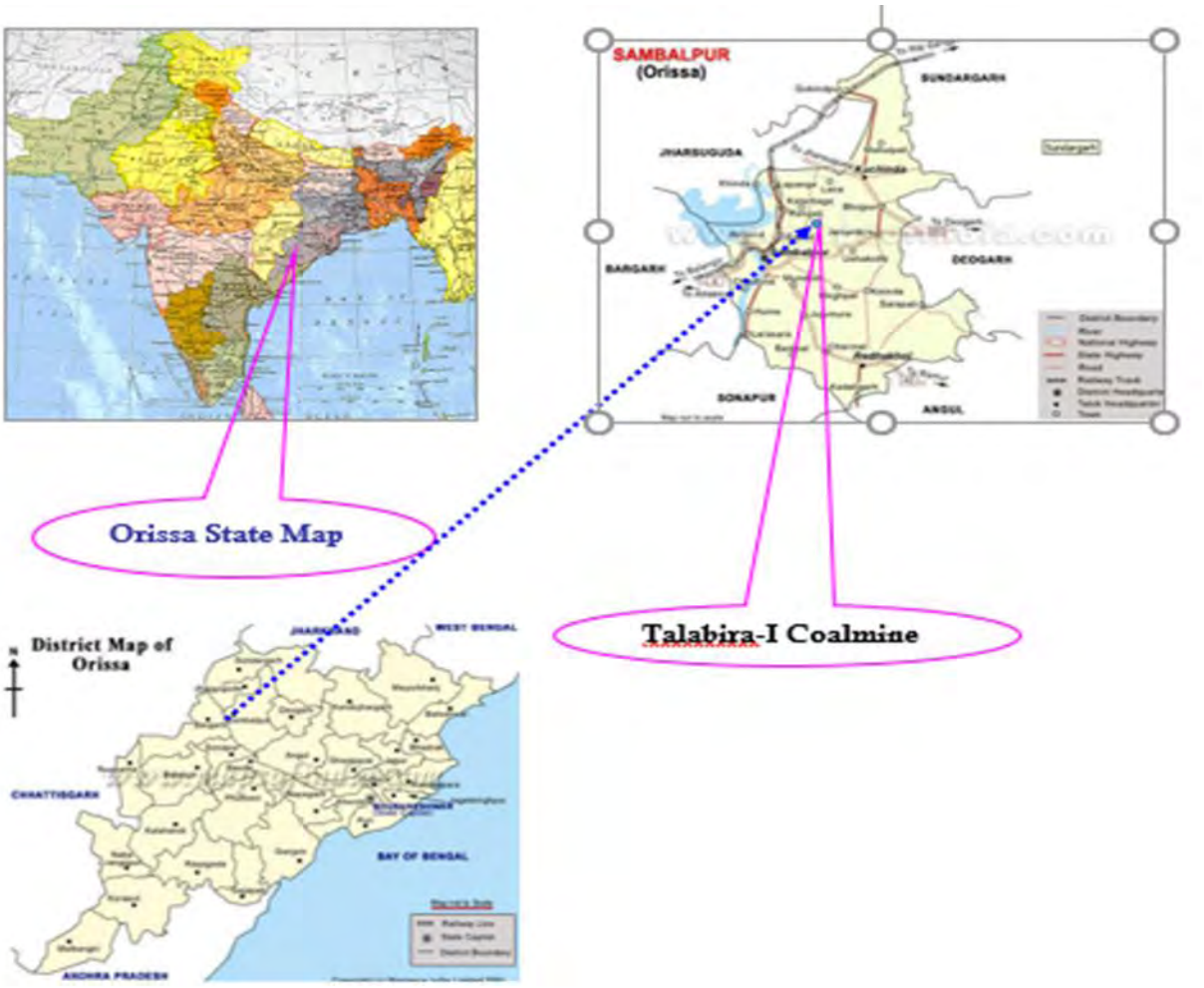

Figure 1 Location of Talibira-1 Coal Block

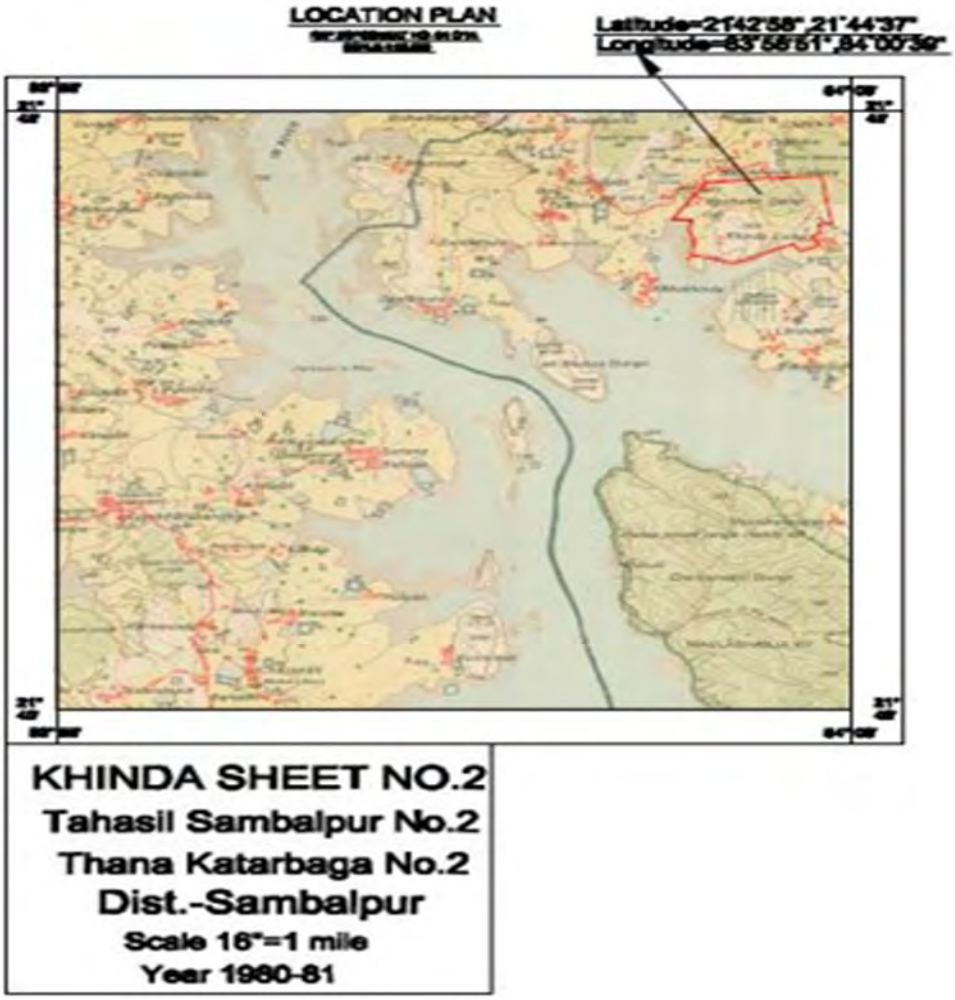

Figure 2 Mine location plan on Topo sheet

Figure 3 Talabira-1 Coal Mine lease Area

2.1 Purpose of the study

The purpose is given in the term of reference (ToR) of the study involves the multi-year project proponent on the Talabira-1, over a period of the year (2003-18). The Socio-Economic Assessment (SEA) has address the socio-economic activities of the Project proponent in eight villages – Talabira, Nua Khinda, Purana Khinda, Lapanga, Bhudiapalli, Matul Camp, Behara Munda and Mundapara, implements CSR activities. The socio-economic development of the villages will be monitored over the life of the project using UNDP.

The SEA also consider the Environmental Impact Assessment (EIA) Notification & Rule -2006 stated by MoEF for the project which focus that assessment should consider the socio-economic matter that may affect or improved the communities.

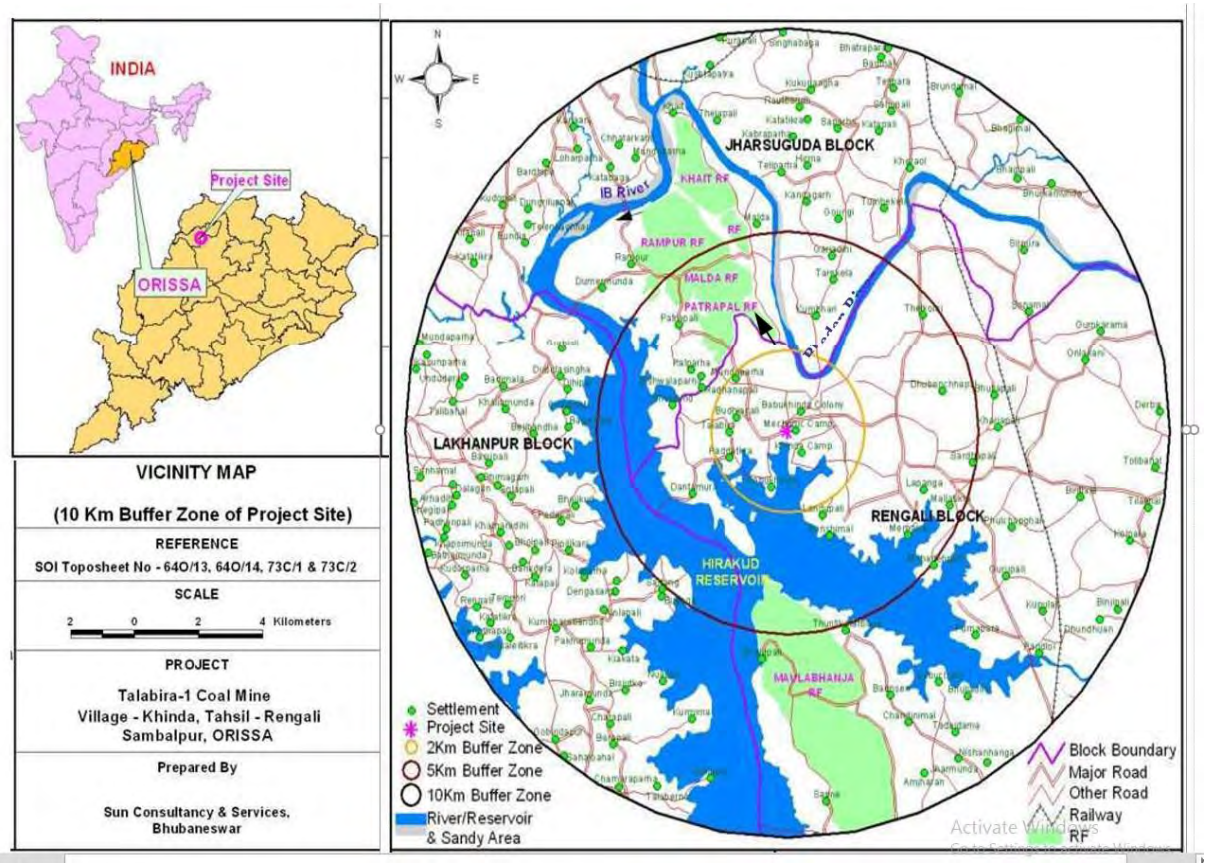

Figure 4- 10 km Buffer Zone of Project site

To conduct the socio- economic status of 10 km buffer area around the coal block.

3.1 Legislative and regulation norms

Mineral deposits are assets that can be used beneficially for the mankind. Minerals deposits are regarded as non-renewable resources and are used by man for (a) material (b) sustenance of life and (c) energy requirements. The mining and quarrying of rocks and minerals is an age-old, economic activity, though its nature and form have been changing over passage of time in many ways and means. The dependence of primitive societies upon mined products is illustrated by the nomenclature of those epochs: Stone Age, Bronze Age and Iron Age, a sequence which also shows the increasing complexity of society's relationship with mining. In a sense, the history of mining is the history of civilization.

Minerals are a valuable natural resource being the vital raw material for the core sectors of the economy. Exploration, extraction and management of minerals have to be guided by

national goals and perspectives, to be integrated into the overall strategy of the country's economic development. Endeavour shall be to promote domestic industry, reduce import dependency, and feed into Make in India initiative.

Natural resources, including minerals, are a shared inheritance where the State is a trustee on behalf of the people and therefore it is imperative that allocation of mineral resources is done in a fair and transparent manner to ensure equitable distribution of mineral wealth to sub-serve the common good. Mining needs to be carried out in an environmentally sustainable manner keeping stakeholders' participation, and devolution of benefits to the mining affected persons with the overall objective of maintaining high level of trust between all stakeholders.

To keep the interest of stakeholders and to follow government rules different acts and rules are farmed by Government of India to make the followings acts for Control and development of mine.

- The Mines and Minerals (Development and Regulation) Amendment Act, 2015

For the acquiring of mines area the area the rehabilitation and resettlement of village area, the laws given by Department of land resources rules were followed which is

- Compensation, Rehabilitation and Resettlement and Development Plan Rules, 2015.
- Odisha R&R policy (2006).

According to Land Acquisition Act and Coal Bearing Areas Act, the mining industries are acquiring the required land, and in the process they are compensating insignificant courtesy towards the communities residing over there.

To develop the Socio- Economic status of the surrounding area of Talibira-1 coal block, United Nation Development Plan (UNDP) guidelines has been followed. The following figure shows the key elements of UNDP's Social and Environment standards.

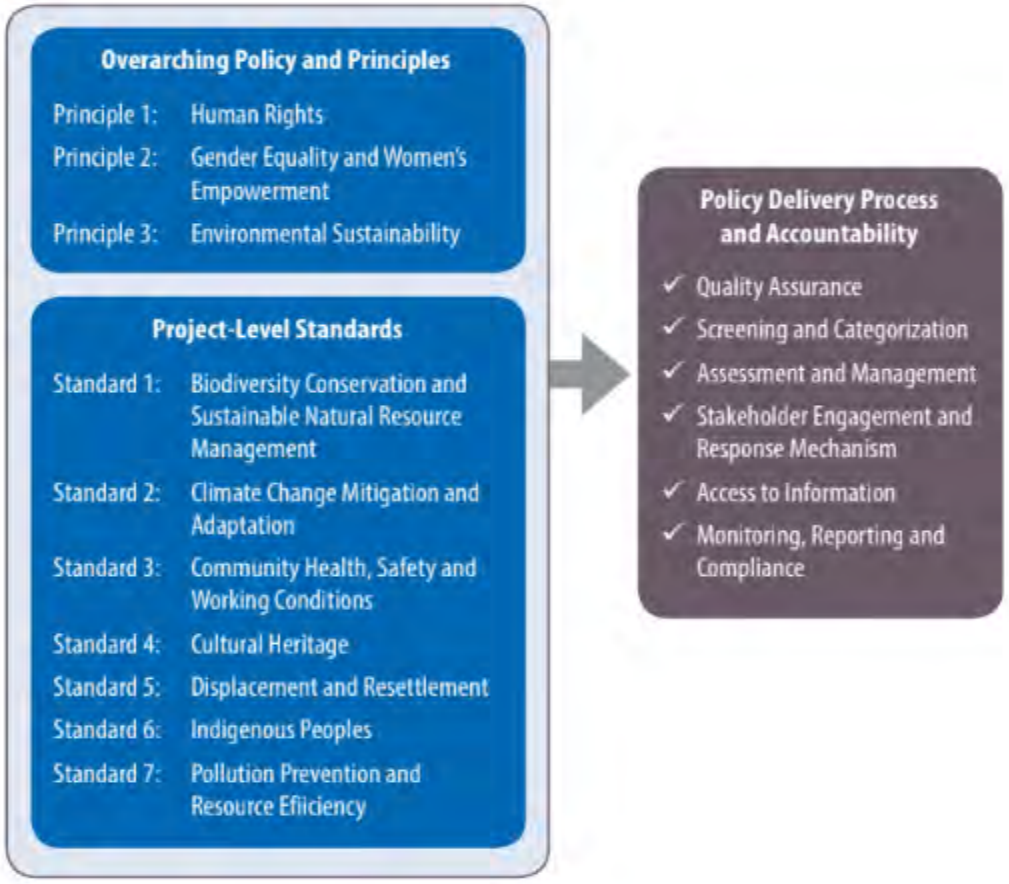

Figure 5 Key Elements of UNDP's Social and Environment Standards

4.1 Socio- economic assessment

4.1.1 Introduction part in Socio-eco development

Socio-economic assessment is a structured way of a showing the advantages and disadvantages of society as a whole. It is the systematic analysis used during EIA to identify and evaluate the potential socio-economic and cultural impacts of a proposed development on their lives and circumstances of people, their families and their communities.

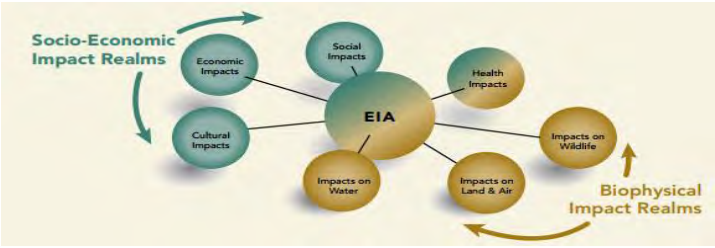

Figure 6 Realms of EIA and SEI

From the above figure as we can see that, socio-economic impact assessment includes following points:-

- Social impacts (e.g. health)
- Economic impacts (e.g. can include effects on employment)
- Environmental impacts (e.g. can be abiotic and biotic component)

The Talabira-1 open cast mine project is a multi-year program, to document and analyses the socio-economic assessment. It has been found that the project will have direct and indirect benefits to the people, which are residing all around the project area. The report shows the Socio-Economic assessment of eight villages, which are Talabira, Nua Khinda, Purana Khinda, Lapanga, Bhudiapalli, Matul Camp, Behara Munda and Mundapara,

- By creating fairly opportunities in different streams Social Economic Assessment focus on the answer using a series of steps such as: - identifying, assessing, mitigating and monitoring the various activities.

4.2 Socio- Economic Status of the village

Village location:-

1) Talabira

The village Talabira comes under Khinda panchayat in Rengali block of Sambhalpur district. The distance of the village from Panchayat head quarter is 2.0 km and its 16 km away from the Blockhead quarter. The village is spread over on approximately 117 hectare of land area. Talabira is a heterogeneous village inhabited by ST, SC and OBC caste people. The literacy level is low in Talabira village.

2) **Nua Khinda**

The village Nua Khinda comes under Khinda panchayat in Rengali block of Sambhalpur district. The distance of the village from Panchayat head quarter is 1km and its 17km away from the Blockhead quarter. Nua khinda is a heterogeneous village inhabited by ST, SC and OBC caste people. The literacy level is low in this village.

3) Purana Khinda

The village Purana Khinda comes under Nua khinda panchayat in Rengali block of Sambhalpur district. The distance of the village from Panchayat head quarter is 6 km and its 23km away from the Blockhead quarter. Purana Khinda is a heterogeneous village inhabited by ST, SC and OBC caste people. The literacy level is low in this village.

4) Lapanga

The village Lapanga comes under Lapanga panchayat in Rengali block of Sambhalpur district. The distance of the village from Panchayat head quarter is 0 km and its 10km away from the Blockhead quarter. Lapanga is a heterogeneous village inhabited by ST, SC and OBC caste people. The literacy level is low in this village.

5) Bhudiapalli

The village Bhudiapalli comes under Khinda panchayat in Rengali block of Sambhalpur district. The distance of the village from Panchayat head quarter is 15 km and its 25km away from the Blockhead quarter. Bhudiapalli is a heterogeneous village inhabited by ST, SC and OBC caste people. The literacy level is low in this village.

6) Matul Camp

The village Matul Camp comes under khinda panchayat in Rengali block of Sambhalpur district. The distance of the village from Panchayat head quarter is 3.5 km and its 20km away from the Blockhead quarter. Matul Camp is a heterogeneous village inhabited by ST, SC and OBC caste people. The literacy level is low in this village.

7) Behara Munda

The village Behara Munda comes under khinda panchayat in Rengali block of Jharasugda district. The distance of the village from Panchayat head quarter is 4 km and its 21km away from the Blockhead quarter. Behara Munda is a heterogeneous village inhabited by ST, SC and OBC caste people. The literacy level is low in this village.

8) Mundapara

The village Mundapara comes under Khinda panchayat in Rengali block of Jharasugda district. The distance of the village from Panchayat head quarter is 3 km and its 20km away from the

Blockhead quarter. Mundapara is a heterogeneous village inhabited by ST, SC and OBC caste people. The literacy level is low in this village.

4.3 Socio-economic development in study area.

4.3.1 Employment

The livelihood for the villagers is primarily agro-based, multi-cropped. Apart from this, service and business is supplementary their livelihood. All the families in the village are engaged in agriculture. As reported by people in the village that few families due to low income and lack of employment opportunity force to migrate for earning their livelihood. The gender wise occupational status reveals that the men are mostly engaged in labour-intensive works like agriculture, non-farm based wages, etc. whereas women in the families provide support in agriculture and do farm based wage, vegetable farming, kitchen garden, livestock rearing, petty business, etc. Apart from managing their daily domestic chores like fetching drinking water, cooking, cleaning of cloths and utensils, taking care of children, etc.

After Allotment of Talibira-1 Coal block in year 2003 by Government of India, the daily wages of worker increases and the employment of villagers increased. Some villagers whose land are resettled were given employment in the mines. Due to the mines, the small-scale shops are opened across the mines. The workers of mine have their lunch break in Tea stall, Dhaba etc. There was increase in number of skilled worker after starting of mine and as well as the number of unskilled workers also increased to do work in mine. The migration of people, which came for working in mine, also increased which resulted in increase in income of shop owners located in these villages.

4.3.2 Regional infrastructure and services

Due to poor socio-economic status, most of the houses in the village either stay in thatched with mud walls or stays in kaccha or pucca mixed type houses. Hardly few families have full Pucca houses to stay. Families those who can afford have constructed mixed (Pucca and Kuccha mixed) type houses. The village got electricity connection but due to low affording capacity, more than half of the families are unable to take electricity connection to their houses. The people who can afford electricity did not get electricity for 24hrs. Due to this the farmers were not able to irrigate there farms properly. The streets of villages did not have street lamp because of that the villagers were not able to travel at night.

Due to CSR activities the villages, which did not have electric connection, were given with electric connection. The villages are given solar panel so that they can have 24hrs electricity. The solar panel are also installed on street lamps. Due to this solar panel installation in villages the schools got 24 electricity which helped the students study in proper environment. This solar panel also helped farmers to fetch water from bore wells and irrigate there farms. Due to installation of solar panels, the villagers didn't have to pay electricity bills, which encouraged villagers to have more solar panels in the villages. The electrification of villages made the villagers very happy and cooperative with the company work and started helping company in such activities. Through CSR activities, the people whose houses were made from temporary things were made available with some modification to their houses like making the brick walls for their houses and providing permanent roof to their houses.

4.3.3 Medical and Health Services

The primary health center is located in the block headquarter of the villages, which is almost 20km from the village. This created shortage of medical center in the villages, for simple treatment villagers have to travel 20km for health checkup. Due to this, many villagers used to get there treatment from their homes, which sometimes created sever health problems to villagers. For not getting proper treatment at the earlier stage of diseases. When the diseases reaches at the last stage, it became severe situation for them. The villagers also did not have any proper knowledge about some common diseases. The people were also not aware about the polio camps for the small children. There were no ambulance facility available. The government has established an Anganwadi center in the village to cater the health and nutrition issue but due to poor infrastructure, villager would not able to access the facilities.

After the intervention CSR activities, poor infrastructure was transformed into modern facilities primary health care center were developed in the villages. Villagers were given awareness about the diseases and how to mitigate the diseases. The medicines were made available at the health center. The ambulance service are made available so that in emergency time the villagers can be taken to block headquarters for further treatment. The medical health camps are conducted in the villages to create awareness at free of cost.

4.4 Education

The location of village was quite remote. There was no proper infrastructure for school around the location. The children primarily suffered due to no nearby accessibility of schools. Later on, the school were built on the location for children. With free mid-day meal, books and dresses were distributed to the every children. This boosted the number of children attendance in school.

Initiative like Computer centers were opened for connecting the children with modern world and to boost their skills in computer tools. The teachers and staffs are given training for their skill development and personality development. The session are focused on how to be more interactive with the student to develop their skills.

The student's parent are also given with special training session i.e. basic reading and writing session. This improved the literacy rate of the people leaving in the village and people are able to freely communicate in other languages like Hindi. The education not only bring down the change in the live but it also influence their livelihood.

4.5 Social Infrastructure

4.5.1 Recreation

The village do not have any recreational facilities for villager. Later on, with the passage of time, through CSR group had pointed out the requirement of group festival, gym and community hall. Although these activities are helping to exchange their views and building the society.

Community hall and gym are another important development recreational took over the period where villager health care and a community hall were require to provide a proper channel for verbal communication within the villager to revive their skills and learning.

The national holidays i.e. Republic day, Independence Day and Mahatama Gandhi Jyanti Diwas are celebrated at Panchayat areas, Community Halls and Schools.

Market facility were completely lacking over the region. Villagers have to move towards Jharsuguda. Local hat take place in every week at Talabira. People normally depend upon local hat for purchasing vegetable, food grains and other daily consumption needs whereas they now visit the main market at Talabira for purchasing other essential grocery item like garment and medicine.

Every year idols of Goddess Durga and Kali Pooja are organized in the region near the community hall. It enthuses the village and bring joy to their lives.

4.5.2 Drainage Facility

The villages has no drainage facility, which leads to water logging during rainy season. As a result, people find problem to move inside the village. Most of villagers used to have open defecation. The villagers which have toilets in their homes there drainage were dumped into the lakes, creek etc. from which the clean water is contaminated.

Through CSR activities, the villagers were giving awareness about the disadvantages of open defecation system and as well as the drainage system of the village were properly maintained. Toilets were made across the villages to bring down the open defecation. The grey water coming out from this toilet were bring to the septic tank which treats this grey water and this water after treatment can be used for irrigation purposes. The awareness was created to villagers that this water could be used for irrigation. Some people from the villages were taught the function of septic tank and taught them how to maintain and clean the septic tank.

4.5.3 Water Supply

The village has various water source like well and surrounding lake to cater, their daily requirement of the people. These sources were used for all purposes e.g. drinking, washing, bathing, livestock etc. The villages have community wells and community tube wells/ hand pumps, ponds and creek facility. Community wells and tube wells are mainly used for drinking and washing purposes whereas the ponds and private wells in the village are used for all kind of purposes. The creek water is used for cattle, livestock. Except creeks, the rest of the water sources give water to people in the village half of the year. Availability of water during summer season is a problem residing in the village. For getting water from creep wells women need to walk long distance for fetching of water. The clean water accessibility was very less, that does not provide enough water for the villagers.

However, the CSR initiative was taken to boost the supply of clean water to these people through tanker on daily basis when the water from clean water sources is dried. It was found that due to good supply of water, the health of scenario of villagers were increased in their respective places. It was also found that people who were earlier suffering through communicable water disease were found drastic decrease in the water borne diseases.

4.5.4 Transportation

The villages were not connected with accessibility for four wheelers. The four-wheeler accessibility was not there to connect the panchayat and block headquarters. This created problem for villagers to get proper access to the ambulance services, water tankers etc. Most of the villages had kuccha road, which created problem during rainy season. Thus, during this season most villager get affected to get to nearby commodities, nearby railways station and the nearest state highways which runs from Jharsuguda to Sambalpur district.

After CSR activities, the village road, which have the kuccha road with narrow path, has transformed with wider and constructed road for proper interconnectivity in the region. These created accessibility throughout the year to the commodities, railway station and state highways. Due to these initiative, had changed the way of accessibility and interconnectivity for the villager to the block headquarters, community hall and health care centers in block headquarters.

4.6 CSR and Other Activities

4.6.1 Introduction

Raipur Energen Limited (REL), 1,370 MW1 (2 X 685 MW) super critical coal based power plant located in Raikheda, Tilda block, Raipur district, Chhattisgarh. For this project, Talabira-1 coalmines has been allotted in the district of Sambalpur of Odisha. Talabira-1 coal block falls under the villages of Talabira and Khinda of Khinda Gram panchayat and Rengali Block of Sambalpur district of Odisha. The company, which is the CSR (Corporate Social Responsibility) arm of the company group, has been entrusted with the lead role of fulfilling community development activities. As early as 2015, REL launched community development programs to enhance the quality of life of 5,382 people dwelling in the villages of Talabira, Khinda and Dantamura near Talabira -1 Coal Mine. The development initiatives focus mainly on the areas of Education, Health, Hygiene & Sanitation and Empowerment & Livelihoods.

In the year 2017-18, focus was given to livelihood activities like tailoring centers and income generation program of WSHGs, enhancement of quality education programs, nurturing Anganwadi centres. Similarly, health problems of different groups (women, children, adolescent) has comprehensively addressed through awareness generation and health camps. Initiatives took to strengthen the women Self Help Groups. Teen Circle organized to build confidence of adolescents and address their health needs.

The company team in Talabira consists of one Program leader and 3 Field Volunteers.

Plan of action for 2018 – 19

Sr. No.	Area of Intervention	Activities
1	**Education**	• Vidya Volunteers for Schools • School bus for poor Ashram School students • Computer Training • International Yoga Day • Refresher Coaching Classes for Class X Students
2	**Health Hygiene & Sanitation**	• Nutrition support to pregnant women, lactating mothers and new born babies. • TEEN Circle activities

3	**Empowerment & Livelihood**	• WSHG activities – Formation & Nurturing • Tailoring/ Stitching training for Girls & Women • Agricultural Training for farmers & WSHG • Fancy Bag Making Training • Marketing support to Press Paper Plate/Bowl unit • Mushroom Cultivation Training • International Women's Day • Sports • Participation of Youths in CEL – D

Expenses of CSR activities

(in Rs.)

SL NO	Areas of Interventions	2015-16	2016-17	2017-18	2018-19	2019-20 (August -19)
1	Education	426000.00	827258.00	1409174.00	1398871.00	0.00
2	Health	85800.00	729732.00	552338.00	7300.00	0.00
3	Empowerment	139000.00	425912.00	540299.00	249447.00	0.00
4	Community Development (Drinking Water)	888000.00	1530988.00	1530988.00	1530988.00	637912.00
5	Others	20000.00	136310.00	107864.00	2668.00	0.00
6	Infrastructure Development	0.00	663000.00	0.00	0.00	0.00
7	Admin Expenses	0.00	0.00	298584.00	150481.00	0.00
	Total Amount	**1,558,800.00**	**4,313,200.00**	**4,439,247.00**	**3,339,755.00**	**637,912.00**

Figure 7 Expenses of CSR activities

The above figure shows the total amount expenditure done on CSR activities.

4.6.2 Education

- Computer training class has been started at BVSS High School, Khinda. In continuation of our promotion of education, program two number of Computer systems had been provided to facilitate the computer training for High School students of BVSS High School, Khinda with an instructor. 194 students imparted computer training. Special

computer fundamental training is being started for the students for this summer vacation. 25 students are attended the training and completed the course.

- During the year, company distributed TOMS shoes benefitting students of Govt. schools. TOMS is a U.S. based shoe company, which works with a mission of One for One. For every pair of shoes purchased, TOMS will give a pair of new shoes to a child in need.

- In order to support and develop the education standard in the peripheral area, we have supported for the annual day function of BVSS high school, New Khinda. In this occasion the Chief Guest

Mr.S.M.Barik addressed the students as well as the guardians present in the occasion. Mr. D. P. Sahu, HM, BVSS High School appreciated the supports like Refresher coaching for class X, Computer center, Vidya volunteers,etc from company.

- **Provision of Vidya Volunteers to Government Schools:** Company extended support to 11 Govt. schools by providing 16 Vidya volunteers, based on the request by the respective Panchayats. The honorarium is paid through a joint agreement between the Panchayats, school committee. The Vidya volunteers are trained to support the regular teachers in the school. This initiative benefited 739 students. The volunteers also supported the school committees in conducting various cultural activities. The Vidya volunteers were also give regular training on joyful teaching methods. The Vidya Volunteers have been provided for teaching support in 11 primaries, middle and high schools, where the teacher student ratio is low.

The Block Education Officer, Rengali has appreciated the performance of Vidya Volunteers and given his thankfulness to COMPANY for this support. To understand the progress at school level, feedback had been obtained from different stakeholders.

- International yoga day has been celebrated on 21 June. As a part of the program, a team of Yoga Experts from the "Art of Living" lead by Shri Debadutta Das, Yoga expert and his two disciples participated in the celebration. Shri Das demonstrated many Asanas and performed by the students and participants. The students were educated on the importance of Yoga. They were explained that yoga helps in maintaining not only physical and mental health but also a healthy social life. In this occasion more than 150 students of Classes – VIII ,IX & X, the Headmasters, Teachers & staff of Biplabi Veer Surendra Sai High School, Khinda and Govt. Middle School, Khinda, had participated in the event. Officials from REL, village opinion leaders, PRI members of khinda Panchayat, villagers along with members of company had also attended and performed yoga on the occasion.

- On the request of the District Administration, company for the benefit of 50 students of Kendriya Vidyalaya provided a school bus. The students are from under privileged/BPL background live in an ashram hostel at Ainthapali, Sambalpur and found it difficult to arrange travel to school due to poor economic condition of their families.

- Special refresher coaching classes had been organized in our area for the students of class X for four months from November 2017 to February 2018 for those who appeared in the state board examination of 2018. Two qualified teachers engaged for the purpose. Some of the employees from Talabira1 Coal Mines regularly visited the center as a part of employee volunteering and taken classes on mathematics, science, meditation and self-confidence. Monthly examinations conducted to review the progress. The center is running nicely and had been attended by the students all high schools located nearby.

4.6.3 Health, Hygiene & Sanitation

- Village Health Nutrition Day (VHND) organized in the area to immunize and vaccinate the pregnant women, lactating mothers and newborn babies in coordination with ANM, ASHAs and Anganwadi workers. As per the request of the BPM, table has been provided to the VHND center for checkup of pregnant women.

- Running nutrition centers in all Anganwadi centers to support supplementary diet for pregnant women and lactating mothers having child of 0-6 months. There are few malnourished children also benefitted from the center. This initiative of company is highly appreciated by the stakeholders.

- A Mega Health Camp had been successfully organized on 23 July 2017 at Budhiapali U.G.U.P. School campus, Budhiapali, in partnership with District Administration, Sambalpur, National Health Mission, Sambalpur, Non-Communicable Diseases Program, Sambalpur & Red Cross Society, Sambalpur. Specialist doctors of O&G, Medicine, Chest, Skin, ENT, Surgery, Pediatric, Eye and Diabetic from Sambalpur were participated in the camp. Dr. Kodanda Rao, CDMO, Sambalpur, Mr. Amit Kumar Dubey, General Manager (Coal Mines), inaugurated the camp, many opinion leaders along with employees of company & Team company participated in the Camp A, number of 30 volunteers supported the camp consisting of company Vidya Volunteers, PRI members, Youths and Anganwadi workers. It observed that the villagers were very happy with this initiative of company. All the stakeholders appreciated the arrangements and requested company representatives to continue their good services towards community. 311 patients from nearby hamlets availed services the services of specialist doctors and benefitted with free medicine & laboratory tests. Due to heavy downpour, many people unable to attend the camp, otherwise the numbers might increase.

- Organized awareness program for truckers on World AIDS Day 2017 in the AIPL Campus. Mr. Rajesh Tiwary, VP & Project Head, Talabira1 Coal Mines along with other GCEL employees attended the program. Members of Youths Association of Jharasugda also attended the program as volunteers. Fifty-five Truckers, helpers, and AIPL employees also participated in the awareness program. Dr. Debadutta Mishra was the resource person for the program; help the participants to understand the causes & prevention of the HIV virus and AIDS with the help of a presentation.

- Adolescence is a period of life with specific health and developmental needs and rights. It is also a time to develop knowledge and skills, learn to manage emotions and relationships, and acquire attributes and abilities that will be important for enjoying the adolescent years and assuming adult roles. The situation of the girls in our area is very vulnerable. Most of the girls discontinued their education due to poor economic condition of their family and early marriage. Not only that they have poor health condition and facing many problems related to gynecology. To address these challenges **"PRERNA"** Teen Circle organized in Budhiapali. During the year classes has been organized on yoga, mehandi art and beauty skills training given to the adolescent girls.

4.6.4 Empowerment & Livelihood

- Tailoring & Stitching training centers started in Babu Khinda, Nua Khinda & Budhiapali during the year. 65 number of trainees completed the six months tailoring/stitching training course. One trainer had been engaged for the purpose. Every month tests (both theoretical & practical) had been conducted to review the progress of training among trainees. At the end of the six months course final examination conducted. The evaluation shows satisfactory performances of the trainees. One expert trainer

had been engaged to review the training, will take session with trainees at regular interval, and conducted the final examination as well.

- Fancy bag Making Training & Production Unit started in GWCC Budhiapali from this year. One new batch comprising of 10 married women from Self Help Groups selected for the course. The trainees are leaning techniques to stich different types of fancy bags six months. The center is running nicely and on demand from stakeholders, another new center planned for Matul Camp and will start from next month. The demand of the bags is overwhelming and the products were sold locally.

  Team Talabira attended weekly and monthly meetings with the WSHGs of Talabira, Babu Khinda, Nua Khinda, Matulcamp, Budhiapali, Dantamura and Mundapada. Team Talabira is prepared the database for the functional WSHG and accordingly a plan will be chalk out for nurturing of existing WSHG, formation of new WSHG, bank linkages and initiation of livelihood projects.

- Every month training given to farmers and WSHG members throughout the year. Training on Agriculture given to farmers and WSHG members in the operational area. Ms. Subhashree Nanda, Assistant Agricultural Officer from Department of Agriculture, Govt. of Odisha. Jharsuguda was the resource person and imparted training to the WSHG members and farmers on different types of crops, vegetable cultivation, kitchen garden, etc. The endeavor includes cultivation thru utilization of modern techniques to get better result. During the different sessions, training given to farmers & WSHG members on the benefits and process of the soil testing, seed selection, seed purification and preservation. The queries of the participants related to seeds, the trainer had answered farming and control of Pests. The training had been started once a month, after the initiative getting good support of villagers and the number of beneficiaries increased, the training session had been extended to twice in a month for both the farmers and the WSHG members.

- An amount of Rs. 1, 50,000/- loan sanctioned to Maa Gauri SHG, Babu Khinda by Punjab National Bank, Lapanga, to start livelihood project and the members decided to start Press paper plate and bowl making unit. Maa Gauri SHG, Babu Khinda had started livelihood project of Press paper plate and bowl making unit and it inaugurated on January 2018. Team Company Talabira facilitating the processes from sanction of loan, procurement of machinery, raw materials to marketing of the product. Company had sanctioned one-time financial support of Rs. 25000/- to the WSHG group members. Even Team of company Talabira successfully managed to get support of one marketing organization who ensured supporting the WSHG group in marketing of their products. The unit is running successfully and all the members actively participating in daily activities to run the project.

- Training on mushroom cultivation & training given to the members of Maa Tarini Self Help Group, Budhiapali. The location we are working is 40 Km far from district head quarter and the inhabitants of the locality are relatively poor. The livelihood of most of the population is depend on the Talabira1 coalmines. Other practices include agriculture but it was also not possible for whole year because during rainy season their fields are covered with overflowing river water due to rain. Even the situation of coal mining is not satisfactory and curtailment of staff by companies lead them to face difficulties in livelihood. To face the challenge a group of women contacted Team Company and on advice of Company, they formed a Self Help Group. The members shown keen interest in mushroom cultivation. Accordingly, the company organized the training on mushroom cultivation in the month of December 2017 and hired one of the best trainer of Odisha from Jagatsinghpur to start the project. The trainer arranged the required materials, raw materials, spawn and chemicals to start this participatory training on Oyster Mushroom. The women member did a very good teamwork in preparation of the bag as directed by the trainer. They earn very handsome amount from the cultivation during the three months. The produce sold locally and they need not to worry about marketing. Their income builds their confidence to continue the process of livelihood and after change in the weather conditions from winter to summer, they change accordingly and on advice of the trainers & company, they participated training on paddy straw mushroom cultivation. After observing the success of the group, another WSHG from the

same villages and two WSHGs from Matul Camp requested company to organize training for them also.

Accordingly, training on paddy, mushroom cultivation given to the members of Maa Tarini WSHG and Maa Tulashi WSHG of Budhiapali village and Binapani WSHG & Dhanalaxmi WSHG groups of Matul Camp. Company arranged the required materials, raw materials, spawn and chemicals and called the trainer from Jagatsinghpur who imparted the participatory training in Budhiapali & Matul Camp in the months of February & March 2018, respectively. The women member did a very good teamwork in preparation of the beds as directed by the trainer and both the groups from Budhiapali earning good amount from their produce and the two groups from Matul Camp awaiting to harvest.

- Six youths had joined courses as per their eligibility criteria in CEL – D during the year. We had organized meetings with the stakeholders in all the villages of our operational area along with few organizations to motivate youths for the training courses. Major constraints is most of the youths with less education indulge in coal trading and earning handsomely and they do not want to work outside their district. Even the six youths had not accepted offer from organizations located in the north & western part of the country. They wanted to work in the locality. For the purpose, we met with the members of Youth Association of Jharsuguda, working for the development of youths and other social activities, they shown their interest in the project and assured us that they will select needy youths from Jharsuguda & Sambalpur district to send them for training as per their eligibility.

- The 11th New Star Cricket Tournament for the "Talabira Cup" organized by the New Star Cricket Club, Talabira. 16 teams from Odisha, Chhattisgarh & Jharkhand participated in the tournament. The final match played between Kunal XI, Sundergarh and Tiger Chargers, Rourkela. The boys from Kunal XI, Sundergarh showed a very good all-round performance and won the cup with huge margin. They displayed their strength of bat after showing their bowling abilities in the last

innings and played extremely well. They pursued the score really well and were able to complete the set objective. As they received the victor's trophy, the team rejoiced.

There was the huge crowd of villagers had gathered in the playground to cheer the teams. Mr. Rajesh Tiwari, Head & Vice President, company and Mrs. B. Lakhra, Block development Officer, Rengali were the chief guest presented trophy to both the winners & runner-up teams, besides other awards such as man of the match, man of series given by other dignitaries attended the ceremony. Mr. Arshu Yadav of Kunal XI, Sundergarh won both the Man of the Match & Man of the Series award for his all-round performance in the tournament. In the vote of thanks speech, the Secretary of the club praised the company and GCEL for supporting the tournament. Mr. Amar Singh, Head HR & FMS and Mr. Tapan Mohapatra, Head Security, RAXA along with the members Team of the company attended the final match and closing ceremony of the tournament.

- On 210th Birth Anniversary of Freedom Fighter Biplabi Veer Surendra Sai, a football tournament had been organized in Nua Khinda. 20 local teams participated in the tournament There was the huge crowd of villagers had gathered in the playground to cheer the teams.

Figure 7 Varalakshmi Foundation

4.6.5 Others:

- Public awareness programs was conducted in the villages and schools about mining, risk associated with intend wild life protection.

- As a part of CSR initiatives, we have arranged drinking water for wayfarers in the different places. In view of the acute summer and heat wave we have placed drinking water pots in the villages of Budhiapali, Mundapara chowk, New Khinda and Babu Khinda.

- Company, organized a Plantation Drive in the campus of Khinda Panchayat Bhavan, and planted fruit trees. After the plantation, all PRI members and villagers assembled in the hall and a discussion session was organized on how to make the area green and clean. Ms. Nilabati Oraon, Sarpanch, Ms. Kamalini Ray, Panchayat Samiti Member and Mr. Birendra Pardhi, Panchayat Executive Officer participated and planted sapling on the occasion. During the discussion, it had been planned to implement Green Club at Panchayat Level and distribution of sapling during rainy season thru Panchayat. Besides company Team, Mr. Pradeep Kumar, Manager-Mining, Talabira1 Coal Mines participated in the program as a part of Employee Volunteering.

- Independence Day celebrated in all the schools of our operational area with distribution of sweets among the students along with the children of Anganwadi Centres.

- There are things in the world that can make us smile but nothing beats the invaluable joy of making someone happy. Daan Utsav is India's festival of giving that brings people from various sectors together, to celebrate and spread the joy of sharing. Held annually in the first week of October (2nd-8th), the festival has empowered millions of Indians to give back to society. Therefore, Team join hands to ensure that this wonderful movement reaches every corner. On this occasion, Daan Utsav has been organized in Talabira this year, on request from company, the employees, their families had donated their good quality clothes to us, and we had donated the same to an organization called "Helping Hand", started & sponsored by Red Cross Society, Sambalpur. Helping Hand distribute these clothes to the needy populace and especially during disasters in Odisha. They also distribute medicines and food item to the needy, orphanage and similar organizations. The clothes had been received & appreciated by Mr. Joy George, Secretary, Red Cross Society, Sambalpur.

- Received an “Appreciation Letter” from the Deputy Collector, Sambalpur for our good work. The appreciation letter duly signed & issued by the District Magistrate & Collector, Sambalpur.

- Republic Day celebrated all over the operational area in Khinda Panchayat. All the schools of our area organized cultural programs on this auspicious occasion. COMPANY & GCEL arranged sweets for all the students & staff of all the schools of the area.

- The 210th Birth Anniversary of Freedom Fighter Biplabi Veer Surendra Sai has been celebrated all around the district of Sambalpur. On this occasion, a grant ceremony organized at his birthplace Babu khinda, one of the village of our operational area. VVIPS and renowned personalities attend the program and pay homage to great son of this soil. GCEL has also given financial support for the occasion.

- On ‘International Women’s Day company organized a special program with the members of TEEN Circle, SHG members and Vidya Volunteers. Mr. Malleswar Rao, AGM (Mines), Mr. Manas Panda, Civil Engineer from company REL along with their family participated in the program. Ms. Vishakha from “Temple of Inner Wisdom” participated and take session on meditation with the all the audiences. She had also given speech on “Women Empowerment”. Few skills competitions organized for the members of TEEN Circle as they received training on these skills and speech competition on “Importance of Women in our Society” was conducted. Ms. Prabhati Dash won the first prize in the speech competition. Prizes for all the competitions given away by the guests and GCEL Employees.

4.6.6 Photos of Talabiria-1 coal block CSR activities photos


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MUSHROOM TRAINING & PRODUCTION CENTRE
MAA TARINI SELF HELP GROUP, BUDHIAPALI
Sponsored by :
GMR VARALAKSHMI FOUNDATION
Supported by :


FIRST AID
TALABIRA COAL MINE
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5.1 Conclusion

The assessment of socio-economic activities attend to bring about overall development of area and the people. In addition to that the payment of compensation to those using their assets for the project with assistance in term of relocation, resettlement and rehabilitation**.** The assessment was a critical planning for the affected communities. The population, which was displaced in the location of their habitat, are reimbursed through CSR activities in 8 villages (Talabira, Babu Khinda, Nua Khinda, Matulcamp, Budhiapali, Dantamura and Mundapada) in addition to implementation of R&R Policy.

The mining activities have brought employment and increased the living standards of the surrounding villages. Through CSR activities, the villagers got easy accessibility to their villages; they also got primary health centers in their villages, Drinking water, Schools, Community halls, various Medical camps for their health checkup and Recreational activities. The villagers have chosen the rehabilitation option, either employment for oneself or employment for a nominated member of the family or cash in lieu of employment.

An attempt by CSR has been made in this study to identify the holistic manner of socio-economic assessment of Talabiria-1 Coal mine. The principal issues have been resolved by CSR activities in proper displacement, rehabilitation and resettlement of displaced people with ultimate objective to achieve overall socio economic development for the villagers. The policies are translated into practice, which seems impossible earlier.