

EXECUTIVE SUMMARY

JAGANATHPUR B UNDERGROUND COAL MINE

(RANIGANJ COALFIELD) (MLA:856.68HA)

RATED CAPACITY/ PRODUCTION: 0.8 MTPA

UNDERGROUND PEAK PRODUCTION (@150% OF RATED CAPACITY): 1.20 MTPA



PROJECT PROPONENT

POWERPLUS TRADERS PRIVATE LIMITED (PTPL),
39, SHAKESPEARE SARANI, PREMLATA BUILDING, 6TH FLOOR
KOLKATA- 70017, WEST BENGAL, INDIA

ENVIRONMENT CONSULTANT
GREENCINDIA CONSULTING (P) LTD



FEBRUARY, 2022

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1. INTRODUCTION

Jaganathpur-B Coal Block had been allotted to West Bengal Mineral Development & Trading Corporation Ltd. (WMDTCL). They had carried out some exploration by engaging M/s. Chandi Steel Industries Limited (CSIL) for drilling. Tata Consulting Engineers Limited (TCE) prepared the Geological Report (GR) & submitted the same in January, 2011. Subsequently, this block was de-allocated under Supreme Court order and reallocated to "Powerplus Traders Private Limited" (PTPL) in February, 2020 by Ministry of Coal (MOC), Government of India (GOI) vide its vesting order (Ref: NA-104/4/2019-NA Dt. 13-02-20) through due process of auction as per Coal Mines (Special Provisions) Act 2015. As the first step towards developing the Block for underground mining, PTPL procured the GR (2011) from Ministry of Coal (MOC) (Vide MOC"s letter No. NA- 104/4/2019-NA Dt. 06-03-20) and reviewed the data.

2. PURPOSE OF THE REPORT

As per the Environmental Impact Assessment (EIA) Notification dated 14th September, 2006 and its subsequent amendments, coal mining leases of area >150 Ha are required to obtain Environmental Clearance (EC) from Ministry of Environment Forest & Climate Change (MoEF&CC) before the commencement of ground activity. This project is independent and does not have any link with other projects which attract directly or indirectly any provisions of schedule of EIA notification, 2006 amended to date.

The project was submitted for Terms of Reference (TOR) on 11th May, 2021 and granted for Standard Terms of Reference (hereinafter referred to as "TOR") on 02nd June, 2021 by MoEF&CC, but during the process of obtaining Mining Plan, it was noted that the vested geological boundary of the Block had an overlap of with Raniganj East CBM block. Due to this, the original mining lease area (869.40 ha) of the geological block had to be reduced by the overlap area of 12.72 ha, as per Ministry of Coal (MOC), Government of India (GOI) vide ltr no. NA-104/4/2019-NA dated 23/06/2021.

Thus, the revised Mining Lease area considered for liquidation of coal reserve is **856.68 Ha** (= 869.40 less 12.72). Therefore, PTPL approached MoEF&CC for TOR amendment. There were no changes to any other details. The amended TOR was granted by MoEF&CC vide ltr No. IA-J-11015/27/2021-IA-II(M) dated 10.2.2022.

This draft EIA report has been prepared for assessing the environmental impact due to the proposed coal mining project and to obtain Environmental Clearance (EC) from MoEF&CC after public consultation. This report will be made available to the public for their comments and concerns. Public hearing will be conducted through West Bengal Pollution Control Board (WPCB) and the Final EIA report will be prepared by further upgrading the Draft EIA Report on the basis of public consultation. Greencindia Consulting Private Limited, an accredited agency with Quality Council of India (QCI) / National Accreditation Board of Education and Training (NABET) vide Certificate No. NABET/EIA/1922/RA 0159 valid up to 27.10.2022, has been engaged by PTPL to undertake an Environmental Impact Assessment (EIA) study and preparation of Environment Management Plan (EMP) on the various environmental parameters, which may be impacted by the proposed coal mining operations.

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3. LOCATION OF PROJECT

The Jaganathpur B Coal Mine is located in the north-eastern part of the Raniganj Coalfield (in District Paschim Burdwan of West Bengal State) in villages Sandipur (04), Basudevpur (05), Binodpur (06), Rajhat (07), Sashipur (08), Dubrajpur (09), Majhidanga (10), Dandeswarpur (11), Ranipur (13), Shyamsunderpur (07), Jot Balarampur (08), Shrikrishnapur (09), Amdahi (25), Jagannathpur (26), Kalinagar (27), in Paschim Bardhaman District, West Bengal State. It is defined by the latitudes 23°38'39"- 23°40'15"N and longitudes 87°21'56"- 87°24'53"E and is included in the Sheet No. 73M/6 of Survey of India. Area of the block is 869.40 Ha with a total production capacity of 0.8 MTPA. Area of the geological block considered for liquidation of coal reserve is **856.68 ha**. The block is almost rectangular in shape with the entire boundary being defined by straight lines except the eastern boundary which is curvilinear in shape. It is bounded by a number of Coal Mines viz. Rangamati B in the north, Jaganathpur A block to the west and Bistupur-Dandeswar to the south. Ajay River forms the eastern boundary of the Block. The area can be approached by both road and rail. The block is situated 12 km north of NH-2. Jhanjra Village is 6 km to the North of the block. National Highway – 2 (NH-2) can also be approached from the block by a west trending road which passes via Ukhra railway station. Andal Airport (Kazi Nazrul Islam Airport) lies around 13 km to the West. It is also well connected by metaled road with Durgapur city which is only 15 km away via Raniganj- Andal-Durgapur Road.

4. BRIEF DESCRIPTION OF THE PROJECT

Nature of the Project:

Jaganathpur B Coal Block is proposed to be developed and worked as a modern underground (UG) mine. Ten (10) coal seams/sections have been encountered in the block viz., R-IX (shallowest), R-VIII (T), R-VIII (B), R-VII, R-VIIA+B, R- VIIC, R- V(T), R-V(B), R-IV, and R-III/II (deepest). Mining Plan has been approved by the **MOC vide order CC/MP&MC/105/2021 Dated: 01.10.2021 (Ref. Annexure 2.1)**. Opencast mining method was rejected in order to minimize the impact on environment and due to geo mining constraints marked by high stripping ratio. The normative capacity of the mine is 0.8 MTPA & Peak Rated Capacity (PRC) of the mine is 1.2 MTPA. Geological exploration has been done for the Jaganathpur-B Coal Block covering the revised Mining Lease area of **856.68 ha**.

Resource Requirement:

- **Land Requirement:** The lease area includes revenue land, government land, tenancy land, forest land and agricultural land. Out of 856.68 ha of Jaganathpur- B coal block, 798.05 Ha is tenancy land and 58.63 Ha is Govt. non-forest land. No forest land is involved. (As per mining plan).
- **Water Requirement & Source:** Total requirement of water (including all purposes) is estimated at 615 kld. However, as a common modular Sewage Treatment Plant (STP) of 185 m³ is proposed, which will generate 55 kld of treated sewage water is used for toilet flushing. Excess treated sewage water of 80 kld will be available for plantation (30kld) and dust suppression (50kld). As per the Hydrogeological study conducted by Central institute of Mining & Fuel Research, Dhanbad, the peak mine seepage has been estimated at 4800 kld. Excess water from mine discharge of 4191 kld will be used to meet the needs of affected villages, for agriculture and other purposes after being treated in the water treatment plant.
- **Manpower Requirement:** Manpower requirement has been assessed on the basis of a 7 day week and 330 days of annual working. The peak manpower for this project has been estimated at 1,920, considering departmental operation.
- **Power Requirement & Source:** The required 20 MW power supply at 33 KV will be drawn from nearest Laudoha (Ukhra) 132 kV Sub Station of WBSETCL (West Bengal State Electricity

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Transmission Co. Ltd.), 9 km from Jaganathpur B block, to the local sub-station from where the power will be supplied to the mine and other functional buildings at required voltages. An emergency arrangement for power supply has been made by providing 1000 kVA and 500 kVA Diesel Generator (DG) sets which will take care of ventilation, pumping and other essential services.

Project Description & Mining Technology

Due to geological and surface constraints, the Bord and Pillar method of mining has been selected applying the latest fully mechanized mass production technology using Continuous Miners, supplemented by intermediate mining technology for excavating small amounts of coal and stone in order to facilitate the positioning of the Continuous Miners and for negotiating geologically disturbed / faulted ground. Marginal use of explosives would be required for this purpose. In view of the widely varying seam thicknesses. It would be necessary to use both thin seam and standard height Continuous Miners and Load Haul Dumpers (LHDs), as shown below:

Nature of Machine	Range of Seam Thickness
Low Height Continuous Miner (LHCM)	1.5 to 3.2 m
Standard Height Continuous Miner (SHCM)	2.5 to 4.5 m
Low Height Load Haul Dumper (LHLHD)	1.2 to 2.5 m

Of the ten (10) coal seams, encountered in the block viz., R-IX, R-VIII (T), R-VIII (B), R-VII, R-VIIA+B, R-VIIC, R- V(T), R-V(B), R-IV, and R-III/II. R-V(T), R-V(B) & R-III/II have mining potential (thickness >1.20m) throughout the block. R-IX, R-VII, R-VII(A+B) and R-VIIC are mineable in maximum part of the block except for a few isolated patches, where the seams lose the mineable thickness of 1.20m. R-VIII(T) & R-VII(B) shows only patchy occurrences of mineable potential. R-IV seam is totally unmineable in Jaganathpur-B block.

5. BASELINE ENVIRONMENTAL STATUS

Baseline data monitoring studies have been carried out for summer season (Oct, 20 to Dec, 20). The meteorological parameters comprising of wind speed, wind direction (from 0 to 360 degrees), temperature, relative humidity, atmospheric pressure, rainfall and cloud cover were recorded on hourly basis during the study period.

Land use Pattern of The Project Site:

A site visit was carried out for the entire project site and the land features were compared with satellite image and SOI Toposheet for data verification. It can be seen that the majority of the project site falls under agricultural land (82.3%). There are also small portions of Built-up (4.3%), Natural Vegetation (4.6%) and Water body (3.0%). Out of the total Mining Lease area of 856.68 ha, only 475.48 ha is required for mining and infrastructure development. The study area (10km radius area from the project site) includes revenue land, government land, tenancy land, forest land and agricultural land. There are many industries and mines in the study area within 10 km radius from the project site.

Ambient Air Quality:

98 th Percentile value of PM ₁₀ varies from		98 th Percentile value of PM ₁₀ varies to	
Location	Value	Location	Value
AAQ5 (Shyamsunderpur)	70.7 µg/m ³	AAQ11 (Banshia)	91.1 µg/m ³

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98 th percentile value of PM _{2.5} varies from		98 th percentile value of PM _{2.5} varies to	
Location	Value	Location	Value
AAQ3 & AAQ5 (Sirsa & Shyamsunderpur)	30.5 µg/m ³	Dharampur	42.8 µg/m ³ (Dharampur)

The 98th percentile value of PM₁₀ varies between 70.7 µg/m³ at AAQ5 (Shyamsunderpur) to 91.1 µg/m³ at AAQ11 (Banshia) and the 98th percentile value of PM_{2.5} varies between 30.5 µg/m³ at AAQ3 & AAQ5 (Sirsa & Shyamsunderpur) to 42.8 µg/m³ at AAQ8 (Dharampur). The higher concentration of PM₁₀ in AAQ11 (Banshia), may be due to its proximity to industrial area and the dominant wind direction. Anthropogenic sources of PM₁₀ include fuel combustion, incineration, domestic cooking in some areas and fuel combustion in for vehicles.

Higher concentration of PM_{2.5} were observed in AAQ8 (Dharampur) due to industrial nature of the area.

The source of SO₂ in the study area is mainly from burning fuels containing sulphur or emissions from coal combustion depending on the Sulphur content in the coal. Sulphur dioxide reacts with other substances in the atmosphere to form sulphate aerosols (USEPA, 1982). Since most sulphate aerosols are part of PM_{2.5}, they may have an important role in the health impacts associated with fine particulates (WHO, 1979). However, the values of Sulphur pollutants in this case were found well below the NAAQ standard. The 98th percentile value of SO₂ in the study area ranges from 11.9 µg/m³ in AAQ5 (Shyamsunderpur) to 20.1 µg/m³ in AAQ6 (Jaydev Kenduli).

Soil Characteristics:

Soil samples were collected from 5 locations. The pH value recorded in the study area varies from "Slightly Alkaline to Neutral" as per ICAR report. The soil texture is mostly clay loam. The moisture content of the soil samples was found to be lower than wilting point. NPK content gives a picture of moderate fertility of soil in the study area.

Water Quality: The baseline water quality status in the study area is established by analysing samples at six (6) surface water and six (6) ground water sources covering 10 km radial distance. The samples were examined for physico-chemical, heavy metals and bacteriological parameters in order to assess the effect of industrial and other activities on surface and ground water. The ground and surface water samples were analysed and it was found that ground water quality was within the drinking water quality limits after conventional treatment.

Surface Water Quality:

Results of analysis indicate that the pH values lie in the range of 7.1 to 7.5. The Total Dissolved Solid (TDS) was observed in the range of 385.00 mg/l to 517.6 mg/l. The chlorides and sulphates were found to be in the range of 44.7mg/l to 75.8 mg/l and 30.1 mg/l to 50.6 mg/l respectively. The surface water quality does not indicate any industrial contamination.

Ground Water Quality:

Results of analysis indicate that the pH ranges in between 7.1 to 7.4, which is well within the specified standard of 6.5 to 8.5. Total hardness was observed to be ranging from 236.3 mg/l to 193.3 mg/l. Chlorides were found to be in the range of 61.6 mg/l to 80.4 mg/l and sulphates were found to be in the range of 30.2 mg/l to 42.4 mg/l.

Noise levels:

According to the classification of Central Pollution Control Board (CPCB), noise monitoring sites in the buffer zone remain in three type areas – Residential zone, Silent zone and Industrial zone. It could be concluded that the monitored noise level in the study area varied from 51.5 dB at N5 (Shyamsunderpur) to 54.3 dB at N6 (Jaydev Kenduli) during day time. During night time, the noise level varied between 41.4 dB at N5 (Shyamsunderpur) to 43.9 dB at N3 (Sirsa). Overall, the ambient

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noise level in the monitored locations was found to be within the permissible limits stipulated for residential and industrial areas.

Traffic Volume Count:

Traffic volume count done in 2 locations indicated that the level of service of all the roads was under Category C indicating general level of comfort and convenience.

Flora & Fauna:

The study area is primarily agricultural. The periphery of the study area is rural in nature. Ecological study was carried out considering the 10 km radius of the proposed project site. Sampling was done on random basis. Trees, shrubs, Herbs and Climbers, Amphibia, Reptiles, Birds, Mammals, Fishes etc. were considered separately and their distribution in the study area was represented separately.

6. ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Table-1 lists the possible impact and significance for the proposed Jaganathpur B coal mine spread over Mining Lease area of 856.68 ha [Block Area- 869.40 ha].

Table 1: Identification of Activities, Impact and its Significance

S.no	Activities	Impact	Significance	
A	Potential Impact on Land			
A-1	Site Clearance and site preparation	Change in land use from agriculture land to industrial land use, 22.91ha for road and infrastructure, 1.03 ha for UG entries and 0.20 ha settling pond are changed.	Long term, irreversible impact	
A-2	During construction phase and Mine Closure Phase	Soil colour is mainly Blackish Brown and of sandy clay nature. 24.14 ha land is proposed for the facilities, where the soil fertility is impacted. Only 36,210 m ³ of Top Soil fertility are damaged. Except for this no soil is damaged.	Long term, negative impact on the topsoil of the area Topsoil will be used for green belt development	
A-3	During depillaring	Contour change. Surface level lowers during depillaring, subsidence will occur, accumulation of water in low lying area	Long term, negative impact, to counter these impacts dozing and crack filling is proposed for land profile restoration and garland drains is proposed for not allowing accumulation of water in the subsidised area	
A-4	During operation run-off in the Mining Lease area and nearest river and water bodies	The terrain is gently sloping towards south and south east. The average elevation of the ground is about 60m above MSL with a minimum and maximum of 66 m and 56m above MSL. As per the CMR, 2017 proper precautions will be taken during extraction of coal beneath the water bodies to prevent subsidence under these water bodies. Hence, there is no impact on surface drainage. Only groundwater seepage will form the source water for Mine drainage.	Long term negative impact. To counter this mine water after treatment and usage will be discharged into the natural drains.	
A-5	During operation	Characteristics of waste and mine drainage water waste will be generated	Nil,	
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S.no	Activities	Impact	Significance
		during mining operation. Total waste/reject generated throughout the life has been estimated as about 0.32 million m ³	Waste will disposed off to use the waste rock to construct the transportation roads and to fill low lying areas elsewhere within ML for improving safety from water, Any balance rock will be kept in reject stack on surface for which provision has been made.
A-6	During drilling and blasting	Drill machines will be used. Blasting causes, ground vibration and air blast propagation. Noise and vibration will occur, the quantum of which is subject to nature of strata and method of blasting.	Controlled blasting techniques will be used for blasting, so surface vibrations will be negligible.
B	Potential Impact on Water Regime		
B-1	Interruption of natural drain	No diversion of any surface drainage channel is envisaged	Nil
B-2	Rainfall & contour of mining area	Garland drain has to be made at the place where there is subsidence. Runoff water and rain water will be drained into the natural drain	Nil
B-3	Ground water sources	Lowering the water table, ground water recharge and hydraulic parameters of the aquifers system of the area will be affected. In underground mining, the aquifer lying in the immediate roof of the working coal seam contributes major inflow and gets affected.	Long term negative impact. To counter this impact, mine water after treatment and usage will be discharged into the natural drains.
B-4	Discharge of mine drainage water	Only the groundwater seepage will form the source water for mine drainage.	Long term, negative impact To counter this, discharge additional water/runoff only after treatment
B-5	Discharge of sewage from offices etc.	Domestic wastewater is generated from general domestic activities such as washing and toilet flushing inside the factories of the industrial area.	Short term impact The impact is considered minor as it mostly occurs during construction period and has no long-term impact with view to persistent pollution
C	Potential Impact on Air		
C-1	Site clearance and site preparation	Dust emission	Short term impact
C-2	During operation	Dust emission due to mining activities like, blasting, drilling, hauling, loading transporting and crushing, vehicular movement and during coal preparation.	Long term, negative impact Water sprinkling will be done as required

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S.no	Activities	Impact	Significance
C-3	Drilling and blasting	Dust emission due to mining activities like, blasting, drilling, hauling, loading transporting and crushing, vehicular movement and during coal preparation.	long term , negative impact Water sprinkling will be done as required
C-4	Loading and transportation	Transportation of coal at transfer points of conveyor, vehicles passing on roads shall create air emissions, loading of coal.	Long term , negative impact

Impact on Land-use: Underground coal mining impacts the land use pattern. The changes in the project are due to (i) construction of infrastructure, (ii) Coal extraction during depillaring stage. During depillaring stage subsidence will occur. The alteration in land use pattern due to infrastructure is not to be considered as true degradation as these can be utilized for some other purposes after mining operations are over. The change in the land use pattern is mainly due to the above two activities. Restoring the land to its pre-mining land use or to a use, that is consistent with the surrounding land fabric. Maintaining the long-term stability of affected land to match with the community and commercial needs the development such as parklands, flora & Fauna sanctuaries, and play- grounds with ecological, tourist and commercial values will be planned. Hence, Land rehabilitation scheme is planned for reclaiming the area of this project.

Impact on Soil: As this is an underground coal mine, loss of top soil would be negligible, However, if any loss is anticipated, the top soil will be handled by separate stacking and used for green belt development. Soil fertility of the 24.14 ha land proposed for surface facilities is affected. Only 36,210m³ of Top Soil fertility are damaged. Apart from this, no significant adverse impact on soil in the surrounding area is anticipated during site preparation and mining operations.

Impact on Climate:

Since, the underground mining operations are not exposed to the outside environment, there will not be any adverse impacts on the local climatic conditions.

No likely effect on the local climate (micro-climate) is anticipated. Rather, some improvement in local climate is expected due to rehabilitated plantation scheme in operation. Any local temperature hikes due to surface transportation and coal handling will be moderated by the existing as well as proposed green belt programme.

Impact on Air Quality: During mine developmental phase, particulate matter will be the main pollutant, which would be generated from the site developmental activities and vehicular movement on the road. Further, concentration of NO₂ and CO may also increase due to increased vehicular traffic movement. As most of the equipment will be mobile, the emissions are likely to be fugitive. The dust generated will also be fugitive in nature, which can be controlled by suitable mitigation measures like sprinkling of water. The impacts will be localized in nature and the areas outside the project boundary are not likely to have any adverse impact with respect to ambient air quality.

The impacts will be localized in nature and the areas outside the project boundary are not likely to have any adverse impact with respect to ambient air quality. From the point of view of maintenance of an acceptable ambient air quality in the region, regular monitoring of ambient air quality shall be practiced to check compliance of standards as prescribed by CPCB.

Impact on Water Resources:

Impact on Drainage: The main drainage of the area lies with Tumni Nala in the West and Ajay River to the East of the block. There are many small & large ponds in the area, which are mostly used by the villagers for domestic purposes. Only the groundwater seepage will form the source water for mine drainage. The water will be automatically drained to the sump in underground working at the

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lower most part of the mine. Adequate provision for pumping out the seepage water from the sump will be provided and the working face will be kept dry. Care should be taken to protect the drainage bore hole from damage while blasting. Underground mine also does not involve any excavation, dumping or re-handling of wastes unlike in case of opencast mines. Total waste / reject (stone debris) generated throughout the life of the mine has been estimated as about 0.32 million m³, which is produced during drivage of stone drifts for approaching from one seam to another seam, main incline drivage and shaft sinking.

Surface Water: The impact of mining at this project on surface water source has been assessed as follows: (i) Disruption of natural drainage pattern in the core zone (ii) Deterioration of water quality & pollution of water bodies, (iii) Siltation and choking of water courses causing scarcity of surface water, etc.

Ground Water: Mining operation and acid drainage can also affect groundwater. However, it is commonly necessary to place an impermeable barrier at the base of the tailing pond to prevent acidic drainage seepage. Older tailing ponds that were constructed without impermeable bases have generated acidic drainage that causes groundwater contamination (Hudson, 2012). To counter this, additional water/runoff would be discharged only after treatment.

Impact on Noise Levels: The major sources of noise during the mine developmental phase are vehicular traffic, mine development equipment like dozers, scrapers, pumps, coal handling plant, compressors, pneumatic tools, drilling and blasting etc. The noise will be generated mostly within the mine boundary and will be transient in nature. Due to the proposed green belt all around the periphery of the mine boundary, these noise levels will be attenuated to a large extent and are not likely to have any significant additional impact on the nearby villages. Acoustic enclosures and noise free cabins will be used to minimize impact of noise on workers.

Impact on Ecological Environment: The study area is primarily agricultural. The periphery of the study area is rural in nature. For development of mine, site clearing would be required which will involve clearing of shrubs only. There is no forest land in the block. Ecological study was carried out considering the 10 km radius of the proposed project site. Sampling was done on random basis. Trees, shrubs, Herbs and Climbers, Amphibia, Reptiles, Birds, Mammals, Fishes etc. were considered separately and their distribution in the above-mentioned study area was represented separately.

Impact on Social Environment: PTPL, has appointed Dr. Harshit Sinha (DRHS) consultancy services, Vadodara, Gujarat for conducting Socio-Economic survey for the affected areas. Agriculture during rainy days is the foremost economic activity of the local community in the region in this interior undeveloped area.

The mining lease area envelopes Sandipur-04, Basudevpur-05, Binodpur-06, Rajhat-07, Sashipur-08, Dubrajpur-09, Majhidanga-10, Dandeswarpur-11, Ranipur-13, Shyamsunderpur-07, Jotbalarampur-08, Shrikrishnapur-09, Amdahi-25, Jagannathpur-26, Kalinagar-27, Paschim Bardhaman District, West Bengal. There are 10 villages in core zone. About 11,491 (approx.) households would be affected as per 2011 census.

Besides this, about 11,491 persons will be benefited by gainful indirect employment opportunities through various service-related activities connected with the project operations as shown.

7. ENVIRONMENT MONITORING PROGRAMME

Post project environmental monitoring is important in terms of evaluating the performance of pollution control equipment/methods installed in the project. The sampling and analysis of the environmental attributes will be as per the guidelines of Central Pollution Control Board (CPCB) / West Bengal Pollution Control Board (WBPCB). The frequency of air, noise, surface water and ground water sampling and location of sampling points are detailed in draft EIA report of Chapter-6 submitted to the

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West Bengal Pollution Control Board. The Environment monitoring cost has been estimated to be Rs. 3.4 crores per year.

8. ENVIRONMENTAL MANAGEMENT PLAN & CER

To ensure effective implementation of environmental policy and its objectives, necessary guidelines and targets will be framed from time to time. Initially, certain guidelines have been framed in different facets of environmental management for bringing uniformity in planning, execution and monitoring systems thereby ensuring environmentally sustainable coal mining operations. EMP also has various plans like Demolition Waste Management Plan, Green Belt Development Plan, CSR plan, minimising use of Natural Resources and Mine Closure Plan & Ecological Restoration Plan which are proposed to be implemented for Environmental Protection. The tentative cost of Rs. 5.26 crores has been provided for in the CER budget.

9. RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

The major risks during operation are fire, subsidence, flooding, accidents during transportation etc. On-site disaster management and off-site emergency plans, commands communication and controls are taken into care in the plan. Adequate provisions like emergency response organization, response plan, material safety data sheet, command & control, capabilities, transportation, medical facilities, mitigation measures, training, education, public awareness, emergency plan review etc. for coping with disaster situations will be made available.

10. ADDITIONAL STUDIES

SUBSIDENCE: Subsidence will occur in the area where full pillar extraction is done and the roof is allowed to cave in. Three-dimensional subsidence prediction modelling using influence function method was used to predict the subsidence movements. Subsidence, slope, compressive strain and tensile strain were predicted at five-year intervals since the commencement of depillaring with caving. 288 panels in nine seams are proposed to be depillared in 66 years from the nine workable coal seams namely R-IX, R-VIII (T), R-VIII (B), R-VII, R-VIIA&B, R-VIIC, R-V (T), R-V (B) and R-III/II, with 70 per cent extraction. There are number of villages and surface structures within the coal block. Angle of draw of 22° was taken into account for design of all proposed panels in order to err on the side of safety. The influence of subsidence is not expected to affect any surface structure. The predicted maximum subsidence, slope, compressive strain and tensile strain due to extraction of coal from nine seams after seventy years are 4098 mm, 44 mm/m, 10.0 mm/m and 9.1 mm/m respectively. Suitable drainage should be made to avoid logging of water in the centre of subsidence troughs as it would affect the surface topography. The surface cracks formed during extraction should immediately be filled-in with soil/mitti to prevent breathing of air and inflow of water to the underground workings. It is proposed to excavate only 442.85 ha and this is the area which can be affected by subsidence. 24.14 ha and 8.49 ha will used for facilities and plantation respectively.

Rock Burst: A rock burst or bump in coal mine is a sudden and violent failure or collapse of the rock insitu under stresses greater than it can normally withstand and on a scale sufficient to cause material damage to endanger the safety of the workers. It is a phenomenon more common in very deep mines. The mine development and depillaring layouts and sequence of extraction have been made to minimize the possibility of rock bursts. Moreover, the working depth of all coal seams except for Seam III/II are quite moderate, making the possibility of rock bursts remote.

Green House Gas Emissions: The construction of the Project (Mine) has the potential to generate GHG emissions through activities required to establish the Project (Mine) such as waste production, transport of materials and staff, and construction of infrastructure and mine access. During the construction stage, the GHG emissions will be relatively low and produced over a short time period. During the operation stage, the average annual Scope 1 and Scope 2 emissions from the mine

DRAFT EIA REPORT- EXECUTIVE SUMMARY JAGANATHPUR-B UNDERGROUND COAL MINING PROJECT (MLA856.68HA) (CAPACITY 0.8MTPA/PEAK RATED CAPACITY 1.2 MTPA) PROJECT PROPONENT: POWERPLUS TRADERS PRIVATE LIMITED(PTPL)	Doc No. 11015272021-IA(II)
	REVISION NO: 03
	REVISION DATE: 30/01/2022

operating are estimated to be approximately 35,970.00 t CO2-e per annum, without mitigation. Purchase of electricity from the grid is calculated to be the largest contributor to the Project (Mine) GHG inventory, followed by diesel consumption, as a distant second.

Rain Water Harvesting: PTPL, as an environmentally responsible company, has adopted a specific “Rain Water Harvesting Policy” for the company. Rainwater harvesting will be planned as per the said policy. Jaganathpur-B being a mine, the mine pit sump/settling pond itself act as a major rainwater harvesting structure during monsoon season. In accordance with the amended TOR for EIA Study and PTPLs concern for environmental protection, PTPL would implement water conservation measures and construct artificial recharge structures by rain water harvesting as per techno-economic feasibility.

Green Belt development: As per the approved mining plan the total area covered under greenbelt is 8.49 ha. Plantation will be carried out at the mine site (along the mine lease boundary, along the haul roads and around infrastructure facilities) at the rate of 2500 saplings per hectare. A total of 21,225 number of saplings will be planted during first ten years from the starting of the mining operation over an area of 8.49 ha. Native species which are more suitable to the local environment are preferred to be planted such as Bakul, Neem, Babul, Ber, Kadam, Peepal, Siris, etc.

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT: The major work-related health hazards associated with activities in underground coal mines are fugitive coal dust emissions, exposure to high heat, noise & vibrations, storage and handling of chemicals/explosives etc.

PROJECT BENEFITS: Proposed project will enhance the socio-economic activities in the adjoining areas by providing employment to locals, enhancing green cover, providing skill development training, improvement in infrastructure, health & education facilities etc.

11. CONCLUSION

From the detailed analysis of the environmental impacts and the remedial measures suggested/recommended, it can be concluded that no significant deterioration in the eco-system is likely to occur due to measures to be taken up during life of mine. On the other hand, the project is likely to have several benefits like improvement in employment generation and economic growth of the area, by way of improved infrastructure and better socio- economic condition.