ENVIRONMENT MANAGEMENT PLAN

ENVIRONMENTAL MANAGEMENT PLAN

FOR

SOIL/ORDINARY EARTH MINING

AT

Village – Sakra Wazid, Thana - Sakra,

District – Muzaffarpur, State- Bihar

AREA: 1.108 ha/2.740 Acres

PROPOSED CAPACITY: 20940Cum/year or 37692Tonnes/Year

APPLICANT

M/s Broadway Links Pvt. Ltd.

Address- Sri Krishna Nagar,

Begusarai,

Bihar- 851101

INTRODUCTION

ENVIRONMENT MANAGEMENT PLAN

The environmental management plan consists of the set of mitigation, management, monitoring and institutional measures to be taken during the implementation and operation of the project, to eliminate adverse environmental impacts or reduce them to acceptable levels. Environment management plan details the quality control measures which are proposed for this project to achieve the production of near about 20940Cum/year or 37692Tonnes/Year. The present environmental management plan addresses the components of environment, which are likely to be affected by the different operations in a mine area.

The aims of EMP are:

- Overall conservation of environment.
- Minimization of waste generation and pollution.
- Proper use of natural resources and water.
- Safety, welfare and good health of the work force and populace.
- Ensure effective operation of all control measures.
- Monitoring of cumulative and long time impacts.

Ensure effective operation of all control measures

The Environmental Management Plan (EMP) has been formulated and integrated with the mine planning to mitigate the adverse impacts which are likely to be caused due to the mining operation and for overall scientific development of local habitat. The EMP has, therefore, been developed considering its implementation and monitoring of environmental protection measures during mining operations.

Salient features of project

The proposed Soil/Ordinary Earth Mining is situated at Thana no.- 863, Khata no.- 520, Khasra no.- 40, 36, 62, 188, 44, 48, near Village – Sakra Wazid, Thana - Sakra, District- Muzaffarpur, State- Bihar over an area of 2.740 Acres or 1.108 Hectare. Proposed mining of Soil is permitted to the M/s Broadway Links Pvt. Ltd., Address- Sri Krishna Nagar, Begusarai, State- Bihar. The estimated project cost is Rs 35 Lakhs.

Details of the Soil/Ordinary Earth Mining

District & state	:	Muzaffarpur, Bihar
Village	:	Sakra Wazid
Thana	:	Sakra
Thana No.	:	863
Khata no.	:	520
Khasra no.	:	40, 36, 62, 188, 44, 48,
Mining lease area	:	1.108 ha/2.740 Acres

Location

Gps Co-Ordinates :

S. No.	Latitude	Longitude
A	N 25°59'31.508"	E 85°33'31.210"
B	N 25°59'31.744"	E 85°33'37.613"
C	N 25°59'31.415"	E 85°33'41.020"
D	N 25°59'28.598"	E 85°33'42.918"
E	N 25°59'29.573"	E 85°33'34.914"
F	N 25°59'30.296"	E 85°33'31.086"
G	N 25°59'28.264"	E 85°33'40.566"
H	N 25°59'27.318"	E 85°33'42.872"

Whether the area is recorded to be in forest:		In Non- Forest Area
Ownership/occupation	:	Private Land
Status of Applicant	:	Director

1.0 AIR ENVIRONMENT MANAGEMENT

Mitigative measures suggested for air emission control will be based on the baseline ambient air quality monitoring data. From the point of view of maintenance of an acceptable ambient air quality in the region, it is desirable that the air quality needs to be monitored on a regular basis to check it vis-à-vis the NAAQS prescribed by MoEF & CC and in cases of non-compliance, appropriate mitigative measures will be adopted. In order to minimize impacts of mining on air and to maintain it within the prescribed limits of CPCB/ SPCB, an Environmental Management Plan (EMP) has been prepared. This will help in resolving all environmental and ecological issues likely to cause due to mining in the area.

1.1 Control of Gaseous Pollution

In mining activities, the only source of gaseous emissions is from transportation activities. The emissions from the diesel engines can be controlled by proper maintenance and monitoring of machine.

1.2 Control of Dust Pollution

The main pollutant in air is PM_{10}, which is generated due to various mining activities. In mining operations, loading, transportation and unloading operations may cause deterioration in air quality due to handling dry materials. There is no other source of air pollution as there is no boiler, DG Set or furnace. Only source of air pollution is re-suspension dust from the movement of tipper/dumper/trucks to and from the mining site.

Study on emission sources and quantification of pollutant concentration by means of dispersion modeling is required to access the environmental impact of a mine. On the basis of the predicted increments to air pollutant concentrations, an effective mitigation and environmental plan can be devised for sensitive areas. As there are no blasting and drilling activities, the impacts may only be caused by material handling, stockpiles and transportation activities.

1.3 During drilling operations

Proposed Project is soil Mining Project Drilling & Blasting is not required. Mining will be done by manual method.

1.4 During blasting operation

Proposed Project is soil Mining Project Drilling & Blasting is not required.

1.5 During loading operation

This reduces the number of buckets to fill from height and thus have comparatively less dust generation.

I) The propagation of this dust is confined to loading point only and does not affect any person the Operators of Dumpers/Trucks/Tippers who will sit in closed chamber and will be equipped with dust mask.

II) Avoid overloading of Dumpers/Trucks/Tippers.

IV) The operator's cabin in the Dumpers/Trucks/Tippers will be provided with dust free enclosure and persons working at high dust prone areas will be provided with dust mask.

1.6 During Transport operation

Transportation

Traffic analysis is carried out by understanding the existing carrying capacity of the connecting main roads in the area. Then depending on the capacity of the mine, the number of tippers that will be added to the present scenario will be compared to the carrying capacity.

Road	V	C	Existing V/C Ratio	LOS
NH 122	1450	15000	0.096	A

Source: IRC 64-1990

V= Volume of Vehicles in PCU's/day & C= Capacity of Highway in PCU's/ day

During Mine operation

Proposed Capacity of mine/annum : 37692Tons/ Year

No. of working days : 225 days

Proposed Capacity of mine/day : 37692/225 = 167.5~168 Tonnes.

Dumper Capacity : 10 Tonnes

: 168/10= 16.8 ~ 17

No. of truck trips /day to and fro : 34 Tipper

PCU (3*34) : 102

Additional Traffic Scenario & LOS due to proposed project

Road	V	C	Modified V/C Ratio	LOS
NH 122	1450 +102 = 1552	15000	0.103	A

Source: IRC 64-1990

V/C	LOS	Performance
0.0 - 0.2	A	Excellent
0.2 - 0.4	B	Very Good
0.4 - 0.6	C	Good / Average / Fair
0.6 - 0.8	D	Poor
0.8 - 1.0	E	Very Poor

Reference: ENVIS Technical Report, IISc, Bangalore

Results

From the above analysis it can be seen that the V/C ratio will be changed from 0.096 to 0.103 with LOS being "A" which is 'excellent, as per classification. So the additional load on the carrying capacity of the concerned roads is not likely to have any adverse affect.

Mitigation measures:

I) All the haulage roads including the main ramp be kept wide, leveled, compacted and properly Maintained and watered regularly during the shift operation to prevent generation of dust due to Movement of dumpers, and other vehicles.

II) Mineral carrying trucks will be effectively covered by Tarpaulin to avoid escape of fines to Atmosphere.

III) Regular Compaction and grading of haul roads to clear accumulation of loose material.

IV) Air quality will be regularly monitored both in the core zone and the buffer zone.

V) Plantation work carried out:

In order to reduce air pollution in the surroundings, green belt will be developed around mines office, mine approach road. The plantation will be done around the lease boundary.

1.7 Monitoring of air pollution

Periodic air quality survey will be carried out to monitor the changes consequent upon mining activities as per the norms of Bihar State Pollution Control Board. Details of monitoring stations have been given below.

2.0 WATER ENVIRONMENT

The proposed area with surrounding is highly undulated. The area is much above HFL and there was no occasion of flooding in the area. From the tube well sunk in the area is observed that the ground water table in the well is about 10 m deep. The quality of the water sample from the tube will be analyzed.

2.1 Ground Water:

The main source of the ground water recharge in the district is rainfall. Apart from this, the return flow from ground water irrigation, seepage from canal, ponds, tanks and direct infiltration from river beds during stream flow are the other secondary sources of recharge. The annual recharge of ground water bodies constitutes the replenishable or dynamic resource.

2.2 Impact on Water Quality:

Surface and ground water is not affected due to mining activity of this mine. There is no perennial source within the leasehold. There is no cause of contamination of water, as no industrial effluent is discharged and there is also no quarry discharge water from mine. The proposed working RL of the quarry by the end of this plan period will be at much higher level from the water table, as such, there will be no impact on ground water body due to this mining.

2.3 Measures for minimizing adverse effects on water regime:

The mining is in a small area. There is no perennial drainage within the area therefore no significant impact on surface water will be made. However due to excavation some changes in base flow may occur but then it has been proposed that mining will be done in already excavated areas so that it will not touch the water regime.

2.4 Mitigation measures

Surface Water Management

I. As such no surface water body exists within the lease area; no adverse impacts are envisaged on the same.

II. Proper mitigative measures will be taken up to control the pollutants within prescribed standards and limiting the emissions to site only.

III. Garland drains will be provided to prevent the entry of rainwater into the mining pit.

Ground Water Management

I. Mining will not intersect the ground water table of the area. So it will not disturb water environment.

II. Natural pits will be used for rainwater conservation and harvesting.

Waste Water Management

No waste water is generated from the mining activity of minor minerals as the project only involves lifting/excavation of Soil and transportation directly to the consumers.

Water Conservation

The project do not consume any process water except for drinking, dust suppression and plantation. Plantation is proposed, which will increase the water holding capacity and help in recharging of ground water. Artificial rainwater harvesting is proposed for the present project

An ambient water quality monitoring network will be designed for assessment of the baseline status of ambient water quality. The parameters to be monitored are given as below:

(1) PH—
(2) E.C. ---
(3) Ca- Concentration
(4) Mg-Concentration
(5) Na- Concentration
(6) K- Concentration
(7) HCO_3—Concentration of bi-carbonate
(8) Cl- Concentration of Chloride
(9) Total hardness as $CaCO_3$

3.0 NOISE ENVIRONMENT

3.1 Impact on environment

Noise generated at the mine is due to Manual mining operations, tippers transportation activities. The noise generated by the mining activity dissipates within the mine. There is no major impact of the mining activity on the nearby villages.

Noise at lower levels (sound pressure) is quite acceptable and does not have any bad effect on human beings, but when it is abnormally high- it incurs some maleficent effects.

In this case the impact of noise on the nearby settlements is negligible. Since there is no involvement of major machinery, the impact of noise levels will be minimal.

3.2 Noise and Vibration Environment Management

Noise pollution due to transportation will cause some problem to the inhabitants of this area because there is human settlement in close proximity to the link roads in lease area. Effective steps will be taken to keep the noise level well below the DGMS prescribed limit of 85 dBA.

3.3 Noise Abatement and Control

I. All the machineries including transport vehicles will be properly maintained to minimize generation of noise.

II. Silencers in the machineries will be provided to reduce generation of noise.

III. Dense plantation in mining area will also reduce propagation of noise outside the core zone.

IV. Periodical monitoring of noise will be done to adopt corrective actions wherever needed.

V. Plantation will be taken up along the approach roads. The plantation minimizes propagation of noise and also arrests dust.

3.4 Vibration Abatement

This is Soil mining project. The Drilling & Blasting is not proposed in the proposed mine which is the main causes of vibration in mining activities.

3.5 Mitigation measures

The impact on ambient noise levels will only be due to transportation and excavation of material and following mitigation measures will be taken for the same.

i. On-site

a) Well maintained vehicle will be used which will be a check on noise level.

b) All the miners will be provided with Personal Protective Equipments such as ear-muffs etc.

ii. Off-site

The off-site receptors are not significantly affected as noise generated by such small mining activities are insignificant but some disturbances due to vehicle movement may not be avoidable. However the following measures have been envisaged:

a) The vehicles will be maintained in good running condition so that noise will be reduced to minimum possible level.

b) Awareness will be imparted prior to mining operations that smoke silencers remain in a good conditions not to generate noise.

c) In addition, drivers will be instructed to make minimum use of horns at the village area.

d) To the extent feasible, route heavy truck supporting mining activities away from residences and other sensitive receptors.

4.0 SOLID WASTE AND TOP SOIL MANAGEMENT

4.1 Nature of waste:

Nil

4.2 Solid Waste management

NA

4.3 Soil management

As stated earlier that All the Khasras having Ordinary clay cover with topsoil. The topsoil 1942Cum shall be scraped & preserved for short period on the berm to spread it after mining activity is completed to restore the fertility of land. All quantities of ordinary clay to be exploited shall be used in filling the soil bed of the Rail line. Therefore, generation of waste shall be nil & no proposal has been envisaged for its separate dumping at mine side. Therefore, waste, sub grade mineral rejects shall not be generated during the course of mining.

4.4 Land Reclamation

The top soil shall be used shall be scraped & preserved to spread it after mining activity is completed to restore the fertility of land.

5.0 BIOLOGICAL STUDY:

The core zone comprises of agricultural land, where mining operation is proposed. Most among them are weeds. No ecologically sensitive plant species has been reported from this area. The faunal variety is rather poor. Mammalian fauna is almost restricted to domestic species like cattle, dogs, cats etc. Bird species also do not exhibit much diversity. Local birds are noticed crossing over the banks in search of food. No fixed pattern in migratory behavior is noticed.

5.1 Flora & Fauna

This mining lease hold area is free from vegetation and also out of forest area. Only few trees and bushes scattering here and there is noticed. Because of lack of forest cover around and close to the mining lease area there is .no wild life of any significance has been reported except some domestic animals.

6.0 GREEN BELT DEVELOPMENT

The proposed green belt in the lease area is to be developed taking into consideration the availability of area as the efficiency of green belt in pollution control mainly depends on tree species, its width, distance from pollution sources, side of the habitat from working place and tree height. The proposed green belt has been designed to control PM_{10}, gaseous pollutants, noise, surface run off and soil erosion etc. While considering the above aspects due care will be taken for selecting the suitable characteristics plant species such as fast growing, locally suitable plant species, resistant to specific pollutant and those which would maintain the regional ecological balance, soil and hydrological conditions.

Greenbelt development programme will be designed within the natural constraints of the site and in particular species selection reflects flora known to be resistant to the local conditions. A Greenbelt development is necessary for:

1. Landscaping and providing shelter
2. Improvement in site conditions
3. Surface air purification by providing oxygen and letting SPM to settle on the leaves.

4. To attenuate noise generated by movement of vehicles and other machinery. Lessee will provide the plantation all along the pit boundary, mine office and all along the roads.

6.1 Plantation Program

Under the afforestation plan, plantation in nearby villages and connecting roads will be undertaken. The implementation for development of greenbelt will be of paramount importance as it will not only add up as an aesthetic feature but will also act as a pollution sink. The species to be grown in the areas should be dust tolerant and fast growing species so that a permanent greenbelt is created. Plantation in the barrier zone and roads is necessary as these areas will contain fine particulates resulting from mining operation and vehicle movement Plantation will also be carried out as social forestry programme in village, school and the areas allocated by the Panchayat/State authorities. Native plants like Neem, Peepal, Mango and other local species will be planted. A suitable combination of trees that can grow fast and also have good leaf cover shall be adopted to develop the greenbelt.

About **390 plants** will be planted along both sides of the approach road and about **50 plants** will be distributed with consultation of gram panchayat. Hence total **440 plants** to be planted.

The following characteristics will be taken into consideration while selecting plant species for green belt development and tree plantation.

I. They will be local indigenous and drought resistant species.

II. They will be fast growing and tall trees.

III. They will be perennial and evergreen.

IV. They will have thick canopy cover.

V. The planting will be around the site to prevent lateral pollution dispersion.

VI. The trees will maintain regional ecological balance and conform to soil and hydrological conditions. Indigenous species will be preferred.

VII. Species will be planted as per CPCB guidelines and native species will be selected.

6.2 GENERAL GUIDELINES FOR GREEN BELT DEVELOPMENT

i. Trees growing up to 5 m or more in height will be planted all around the mine boundary.

ii. Plantation of trees will be done along road side and distributed with consultation of gram panchayat.

iii. Trees will be planted along roadsides, to arrest auto-exhaust and noise pollution, and in such a way that there is no direct line of sight to the installation when viewed from a point outside the foliage perimeter.

iv. Since tree trunks are normally devoid of foliage (upto 3 m), it will be appropriate to have shrubbery in form of such trees to give coverage to trunk portion of these trees.

v. Fast growing trees with thick perennial foliage will be grown, as it will take many years for trees to grow to their full height.

In order to facilitate the proper growth of vegetation, limited measures involving preparation of seedbed with suitable amount of fertilizers and treatment with mulches will be taken. The topsoil will be used for green belt development & revegetation. Vegetation covers in and around the mine workings generally helps in:

- Stabilizing erodible slopes to minimize pollution
- Control of dust.
- Enhancement of aesthetic value.
- Reducing noise.

For revegetation, the plants and saplings suitable for the existing soils and site conditions may be considered. Fast growing local plant species will be planted, which can adapt to the local climate. This has to be done in consultation with local forest department.

7. COST OF EMP IMPLEMENTATION

A yearly cost of implementation of mitigation measures envisaged as mentioned below for the project works out to be:

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	Nil	2,00,000
2	Pollution Monitoring i) Air pollution ii) Water pollution iii) Soil Pollution iv) Noise Pollution	--	 14,000 (4 samples) 8,000 (2 GW & 2 SW) 8,000 (2 samples) 7,000 (2 samples)

3	Plantation	88,000	1,00,000
4	Construction and maintenance of haul road	1,00,000	67,500
TOTAL		**1,88,000**	**4,04,500**

Note: *440 plants * 200 Rs (for each plants including hedges) = 88,000/-

Salary of Labor for haul road maintenance 2 labor*150 =300 per day

300* 225 = 67,500/-

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