ENVIRONMENT MANAGEMENT PLAN

1. INTRODUCTION

Environmental Clearance of mining lease for extraction of Sand/Morrum from river bed of Belan from Zone No/Gata No/Khand No. -48, Area 4.00 Hectares (9.88 Acres) at Village – Bhagesar to Sipauwa & Bans to Amiliya Tehsil- Koraon, District- Allahabad, (Prayagraj), Uttar Pradesh of M/s Sweta Enterprises.

- Environment Clearance is required for sand mining lease.
- Proposed mining lease Area 4.00 Hectares (9.88 Acres).
- The mining lease period is 5 years from the date of commencement of mining lease deed.
- It has been proposed that approximately 40,000 m3 /annum of sand will be extracted.
- The Total Project cost is approx 60.91 lacs/annum
- Coordinates of mine site at

Khasra/ Gata Nos	Latitude N	Longitude E
A	24° 56' 24.21"	81° 57'48.7"
B	24° 56' 28.81"	81° 57'47.83"
C	24° 54' 54.04"	82° 1'11.50"
D	24° 54' 51.82"	82° 1'9.73"

There is no National Park, Sanctuary, Elephant/Tiger Reserve, eco-sensitive area, Interstate boundary, migratory routes within 10 km of the project site.

**Since there are no protected areas notified under the Wildlife (Protection) Act, 1972, critically polluted areas, notified Eco sensitive area, interstate boundaries are falling in whole or in part within 10 km radius of the proposed project, general conditions are not applicable to proposed project.*

2. ENVIRONMENTAL & SOCIAL LEGAL POLICY AND INSTITUTIONAL FRAMEWORK

The EIA Notification of the MoEF, 14th September 2006 warrants environmental clearance from the MoEF for Mining of Minerals (section 1(a). Apart from the EIA notification, the Government of India has laid out various policy guidelines, acts and regulations for protection of environment. Summary of relevant legal requirements considered for this project are tabulated below. The mining sector has separate set of legislations covering management, conservation, grant and operation of mining lease. In addition there are environmental/forest regulation, applicable to mining of minor minerals as prescribed by MoEF and CPCB.

Table 1: Acts and Legislations applicable to Mining projects

S.No.	Acts and Legislations	Year
1.	The Mines Act	1952
2.	The Mines and Mineral (development and Regulation) Act	1957
3.	Mines Rules	1955
4.	Mineral Concession Rules	1960

5.	Mineral Conservation and Development Rules	1988
6.	Granite Conservation and Development Rules	1999
7.	The Environment (Protection) Act, MoEF, CPCB	1986
8.	Notification on Environment Impact Assessment of Development projects (and amendments) (referred to as the Notification on Environmental Clearance) MoEF, CPCB	2006, 2009
9.	Wildlife Protection Act, MoEF	1972
10.	The Forest (Conservation) Act, MoEF	1980
11.	Water (Prevention and Control of Pollution) Act (and subsequent amendments), CPCB	1974
12.	Air (Prevention and Control of Pollution) Act (and subsequent amendments), CPCB	1981
13.	National Resettlement and Rehabilitation Policy,	2007

Honorable Supreme Court has given the ruling, dated 27.02.12, for obtaining prior EC of the mining lease area of less than five hectares (< 5 Ha) also. The gist of the ruling is as under:
"*We in the meanwhile, order that leases of minor mineral including their renewal for an area of less than five hectares be granted by the State/Union Territories only after getting environmental clearance from the MoEF ordered accordingly*."

1.1. PROJECT TECHNOLOGY /PROCESS DESCRIPTION

The proposed project is to mine sand from river bed Ganga sustainably and scientifically, after obtaining the consent from the plot owner. Mining will be opencast and manual from Khand No. -48, Area 4.00 Hectares (9.88 Acres) at Village – Bhagesar to Sipauwa & Bans to Amiliya Tehsil- Koraon, District- Allahabad, (Prayagraj), Uttar Pradesh of M/s Sweta Enterprises. Following geo-scientific methods are proposed to carry out the activity:

- Mining of sand will be restricted to a maximum depth of 3 m in proper bench form as per MCR-1960.
- No drilling, blasting and beneficiation is proposed.
- Approximately 40,000 m^3 /annum sand will be extracted.
- No mining activity will be undertaken during the monsoon season.
- The mining activity will be restricted to daytime only in order to avoid environmental pollution or any accidental hazards.
- The operation will remain manual, using tools like shovel, spade, sieve etc.

4. ENVIRONMENT MANAGEMENT PLAN

To mitigate the adverse impact which will be caused due to the mining operation and overall scientific development of local habitat, environmental management plan (EMP) has been formulated. The details of the anticipated impacts and mitigative measures have been discussed in below, based on the results of present environmental conditions and environmental impact assessment. The EMP has therefore been made considering implementation and monitoring of environmental protection measures during and after mining operations.

The factors which determine the effect have already been identified earlier in this report. To minimize the adverse impact, certain control measures are enumerated below for implementation.

5. IMPACTS OF SANDMINING

Impacts of sand mining can be broadly classified as given below:

A) PHYSICAL ENVIRONMENT

The large-scale extraction of streambed materials, mining and dredging below the existing streambed, and the alteration of channel-bed form and shape leads to several impacts such as erosion of channel bed and banks, increase in channel slope, and change in channel morphology. These impacts may cause: (1) the undercutting and collapse of river banks, (2) the loss of adjacent land and/or structures, (3) upstream erosion as a result of an increase in channel slope and changes in flow velocity, and (4) downstream erosion due to increased carrying capacity of the stream, downstream changes in patterns of deposition, and changes in channel bed and habitat type.

Mitigation measures

- Sand mining will be restricted up to 3 m.
- Mining will be done at a slope of 30°, in forms of benches of 1m*3m (width and height).
- Dredging will not be allowed.
- Drilling or blasting will not be allowed.
- Formation of bund wall around the excavated plot.

B) LAND ENVIRONMENT

The impacts of sand mining on land are predominantly governed by the area acquired and Landuse characteristics. The Toposheet should form the basis of impact prediction on land. Cost- Benefit analysis is also carried out to see the overall benefits, the project will bring and the economic benefits the land is providing to the area are to be estimated.

Cost Benefit Analysis

The cost benefit analysis of the proposed project in terms of environment conservation and protection has been worked out as follows:

- The project will help in providing an evenness and stabilization to adjoining vicinity.
- Employment generation for semi-skilled, non-skilled people of the locality which will enhance the socio-economic status of the local people.
- Besides, the project will also generate revenue for State Govt. in terms of royalty and dead rent etc. from the mining lease.

a) Impact on quantity and characteristics of top soil

It is a sand mining project. The excavation will be carried out in such a way that the top soil will be temporarily stored under tarpaulin sheets if any and will be reused for making bunds during mine closure.

b) Impact on soil quality of the surrounding area

Since it is Sand mining project, no over burden or waste will be generated during mining activity. Impact of siltation due to wind or water erosion will be moderate, which will be minimized by making bunds around the excavation plot and terracing and planting soil binding species (detailed in Mine Closure Plan).

c) Impact on existing land use

The mining activity is restricted to the excavation of sand, as per letter Of Intent (LOI). There will be a change in land use, as the existing land use is Govt. land (river bed), the project does not involve any creation of new land use.

d) Impact of siltation in the pits

Pit formed as a result of sand mining activity will be replenish due to flood may have impacts of siltation from adjoining areas, will be minimized by making bunds on river bed lease area and terracing and planting soil binding species.

e) Impact on Ecology

Ecology includes the vegetative cover on excavation plot and adjacent plots. Mining which leads to the removal of channel substrate, resuspension of streambed sediment, clearance of vegetation, and stockpiling on the streambed, will have ecological impacts. These impacts may have an effect on the direct loss of stream reserve habitat, disturbances of species attached to streambed deposits, reduced light penetration, reduced primary production, and reduced feeding opportunities.

2.1.3. WASTE DUMPS

This is sand Mining project, no drilling; blasting is proposed thus not involving any waste generation. The excavated material will be cast into sand, loaded and transported directly to the Sand, not leaving any waste dumps behind.

a) Mitigation Measures

- Mining will be done as per the mining rules in the designated lease area from for a period of 5 years up to the required depth only (3 m) and will be confined to excavation plot only.
- The Mineable reserves will be limited by:
    a) Bench height and width of maximum 1 m*6m.
    b) Bench slope of 30° from vertical.
    c) Bund wall around on river bed.
    d) Plantation of soil binding and fencing species on slopes and bund walls, respectively.
- Mining below subterranean water will not be done.
- There will be no mining during the monsoon season.
- Access roads from public roads and up to excavation plot will be aligned in such a way that it would cause least environmental damage.
- Siltation of agriculture Land will be prevented.

C) AIR ENVIRONMENT

a) Anticipated Impacts and Evaluation

Air pollution is likely to be caused at various stages of sand mining operations such as excavation, loading, transportation. Dust generated during mining of sand, loading, unloading and transportation of cast sand are the main pollutants of sand mining operations. Most of the dust will be generated from loading, screening and transportation operations. This dust becomes air borne and gets carried away to surrounding areas. The impact on air is mainly localized in nature as the dust particles are not carried to longer distances and the effect is felt within the core zone of the project. Loading, transportation and unloading operations may cause deterioration in air quality due to handling of dry materials.

b) Mitigation Measures

The only air pollution sources are fugitive dust emission due to movement, loading, unloading and Transportation of sand.

- Dust suppression measures like spraying/sprinkling of water to keep the surface wet.
- Overloading of the trucks/tractor trolleys will not be done.
- Transportation of material will be done in covered vehicles to prevent dust emission in case of long haulage or if the road passes through in close proximity to habitation.
- Provision of water spray on the dumper and roads to arrest fine dust before transportation.
- Suitable dust barriers in form of plantation will be done near excavation site and haulage road.

D) WATER ENVIRONMENT

a) Anticipated Impacts

There are no wastewater discharges to water bodies from the sand mining operations. The inflow of sewage or effluents from the surrounding locality is also considered nil as there will be no sewage generated on agricultural fields. The only water contaminant is rainwater run-off during the monsoon season.

In stream sand mining activities will have an impact upon the river's water quality. Impacts include increased short-term turbidity at the mining site due to re suspension of sediment, sedimentation due to stockpiling and dumping of excess mining materials and organic particulate matter, and oil spills or leakage from excavation machinery and transportation vehicles. Increased riverbed and bank erosion increases suspended solids in the water at the excavation site and downstream. Suspended solids may adversely affect water users and aquatic ecosystems. The impact is particularly significant if water users downstream of the site are abstracting water for domestic use. Suspended solids can significantly increase water treatment costs.

b) Mitigation Measures

As the project activity is carried out on excavation plot up to a depth of 3 m, none of the project activities will affect the ground water or river stream environment. There is no surface water body in the adjoining vicinity of the excavation plot, hence anticipated impacts are nil.

PP will adhere to all guidelines and rules for proper and scientific method of mining during the period of extracting the Sand. Thus, the project activities shall not have any adverse affect on the physical components of the environment and therefore may not have any effect on the recharge of ground waters or affect the water quality.

- Formation of bund wall on the river bank side to prevent flow of nutrient rich water from adjoining farms into the mining area.
- Mining operation will be restricted to the depth of 3 m from ground level.
- Quality of dug well to be monitored, in order to ensure the quality of water is not affected.

E) NOISE ENVIRONMENT

The proposed Sand Mining project is manual, thus will generate very less noise, that too by the movement of vehicles as drilling blasting etc. are not proposed.

a) Anticipated Impacts and Evaluation

As there will be light earth moving machinery there will not be any major impact on noise level due to the mining and other association activities. Blasting technique is not used for sand mining, hence no possibility of land vibration. It was found that the mining activity will not have any significant impact on the noise environment of the region. The only impact will be due to transportation of materials by carts/tractor trolleys/trucks.

b) Mitigation Measures

As the only impact is due to transportation of raw sand though village roads, emphasis will be given on the following points.

- Truck/Tractor trolleys will be well maintained and PUC certified.
- Timely maintenance of vehicles and their silencers to minimize vibration and sound.
- Minimum use of horns in the village area and silence zone (if any) as applicable.
- Care will be taken to produce minimum sound during loading.
- Labours will be provided with personal hearing protection device i.e. ear plugs or ear muffs if required.
- Noise and dust barriers in form of plantations will be done at haulage roads.

F) TRAFFIC ANALYSIS

- Movement of Truck/Tractor within the site is inevitable. However, this activity will only lead to dust emissions and would not cause any significant impact on the ambient air quality.
- The noise levels are also expected to be negligible on account of onsite vehicular movement.
- The safety issues due to onsite vehicular movement would be negligible as tractor trolleys and carts will be used on excavation site.
- Plantation will be done along the haulage route, which will act as dust and noise barrier.

G) BIOLOGICAL ENVIRONMENT

a) Anticipated Impacts and Evaluation

The sand mining activity will have insignificant effect on the existing flora and fauna. Data have been collected from various Government Departments such as forests, agriculture, fisheries, animal husbandry and various offices to establish the pre-project biological environmental conditions. There are no endangered species, wildlife sanctuary, wildlife

corridors or eco-sensitive area near the core zone. Hence, it is found that the sand mining activity will not have any significant impact on the biological environment of the region.
The detrimental effects to biota resulting from sand mining may have an effect on:

b) Mitigation Measures

- Excavation will be done only up to a depth of 3 m in stipulated time period of 5 years as per agreement.
- There is no migratory route of avifauna or grazing route of domesticated animal is reported, hence there will be no impact anticipated.
- Mining operation will be carried out during day time.

H) IMPACT ON ECOLOGY OF THE AREA

Sand mining which leads in the river bed will have ecological impacts. These impacts may have an effect on the disturbances of species and reduced primary production.

Sand formation spans over a period of thousands of years. Today, demand for sand continues to increase, due to massive construction. Mining operators, in conjunction with cognizant resource agencies, must work to ensure that sand mining is conducted in a responsible manner.
Excessive and unscientific mining causes the degradation of land. Sand mining lowers the level of land, which may lead to siltation from adjoining farms through wind and water erosion. Depletion of fertile soil from adjoining farms may result in lowering of productivity and crop yield. Mining generates extra vehicle traffic, which negatively impairs the environment.

Mitigation measures

As the present mining will be done in a scientific manner as mentioned before, significant adverse impacts are not predicted; however the following mitigation measure will be taken to further minimize it.

- No mining will be carried out during the rainy season; hence water erosion may be prevented.
- Bund walls around on the river bank side along with bio-vegetative bunding will arrest siltation.
- The mining activity will employ tractor trolleys or carts to transport the cast sand outside the mine to desired destination. Safe site/routes having less impact will be selected for transportation.
- Plantation of dust and noise barrier species such as bamboos, euphorbia etc may be planted along haulage route.

I) SOCIO-ECONOMIC ENVIRONMENT

The proposed project will have direct and positive impact on socio-economic environment. The field survey conducted based on a social study to understand the knowledge and the perception of the people living around the project area, gives a clear idea about the need for the project. The project activities shall not have any adverse impacts on any of the common property resources of the village communities. The land is taken on lease from land owner for the purpose of land leveling and mining. There is no R & R involved in this project. There is no land acquisition in this project. This activity will help raise the socio-economic status of the people who are directly and indirectly involved. This project will provide employment to the people residing in vicinity people will to be benefited directly or indirectly by the project. Only local labor will be used for the proposed mining operation.

Occupational Health

There is no environmental pollution due to the proposed mining as it is proposed to be a mainly manual mining or extraction of Sand, hence there will be no major occupational health hazards. The villagers avail medical facilities from the public health center locally and for specific treatments & health assistance they avail facilities from govt. hospital located at district.

Anticipated Health Impact

A health survey has shown that the effect on public health will be primarily due to emanation of dust & smoke from the haulage of transport vehicles in the buffer zone. On continuous exposure to the proposed activities certain occupational health hazards are anticipated:

- Fungal infection of the hands and legs due to constant contact with Sand.
- Due to lack of personal hygiene water borne diseases are also envisaged to the workers.
- Continuous exposure to sand dust can lead to silicosis, Silica tuberculosis other pulmonary diseases.
- Poisonous bites of snakes, scorpions may occur during mining

Proposed mining activity may not pose any adverse health hazard to the people in & around the area as healthy mining practices are carried out during the course of mining and the activities are restricted to small scale extraction.

Mitigation measures

An inventory of the risks involved during the proposed project would be delineated with the measures to mitigate the same and the same would be ensured to the people by conducting an awareness program in the surrounding areas.

- Predominantly mining activities should be manual, using hand to avoid accidental hazards.
- Labour will have access to basic first aid (first aid –box) facility on site.
- Anti venom will be provided in case of snake bites.
- Safety precautions will be taken and suitable PPE including nose masks shall be provided.
- The workers will be trained on using personal equipments as a precautionary measure & thereby preventing any infectious diseases.
- Workers will be periodically made aware of health & safety and various other risks.
- Special emphasis to the women health regarding the pre-natal and post-natal care will be looked into which is very much neglected in the rural areas.
- Prior to mining, short awareness program will be conducted for labours to make them aware of the way of working.

J) RESETTLEMENT & REHABILITATION

Not required

K) MINE CLOSURE PLAN

To consider the environmental aspects of mining of Sand for their integration into the mining process, specified safe guard measures required to minimize the likely adverse impacts of mining on environment, so as to ensure overall sustainable development being discussed as follows:

In order to conserve the local and regional environment, following protective and mitigatory measures will be taken for the extraction of sand from the specified Gata/ Gata(s) under the mine closure plan.

1. Mining operations will be carried out as per mining rules systematically and scientifically.
2. Mining operations will be carried out on a slope of 30° making benches. The height and width of each bench will not be more than 1m.
3. Stabilization of slope will be done by planting species having extensive root system, so as to bind the soil.
4. Species will be chosen, keeping in mind the local topography, morphology and soil characteristics.
5. Species will be planted across the slope so as to arrest the soil movement, due to wind and water erosion.
6. Species planted will be *Agave nector, Saccharum officinarum* (Munja), *Cassia tora* (Charata), *Opuntia ficus indica, Aloe vera* (Gheekwar), *Argemone maxicana, Euphorbia hirta.*
7. Top soil if any will be removed and stored under tarpaulin.
8. During mine closure, this stored top soil will be used for bunding.
9. Plantation of Agave nectar, *Cassia tora* (Charata), *Opuntia Ficus indica* etc on the slopes and terraces will ensure that the fertile top soil from adjoining farms does not flow into the pit formed.
10. It will also prevent accidental slippage of humans and cattles into the pit.
11. The flat area of the pit will be levelled and can again be used for cultivation/ agriculture after mining activity.

L) CORPORATE SOCIAL RESPONSIBILITY

Environment protection and its preservation is today the major concern all over the world. The environment proves that all the human activities on this earth are inter-connected, so much so that an environmental damage in the boundaries of one state has trans-border ramifications. Environmental destruction and pollution has seriously threatened the human life, health and livelihood.

Understanding the need to give back to the society, State SEIAA has made it mandatory to invest 2 % of total project cost in CER activities as-Provision of private or community latrines in the village.

Project Cost – 60.91 lacs/ annum

CER @ 2 % - 1.22 lacs/annum