EXECUTIVE SUMMARY OF ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENT MANAGEMENT PLAN

FOR OBTAINING

Environmental Clearance under EIA Notification – 2006

Schedule Sl. No. 1 (a) (i): Mining Project

"B1" CATEGORY – MINOR MINERAL – CLUSTER – NON-FOREST LAND

CLUSTER EXTENT = 5.25.95 hectares

BLACK GRANITE QUARRY

At

Irudukottai Village, Denkanikottai Taluk, Krishnagiri District,

Tamil Nadu State

TOR File No.10853

TOR Identification No. TO24B0108TN5105918N, dated.25/06/2024

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No.	Production
D.Karunanidhi S/o.Dharuman, No.15, Valasagoundanur, Puliyampatti Post, Pochampalli Taluk, Krishnagiri- 635206.	1.36.45ha & 720/3(B), 725/1(P), 725/2A,726/B1(P) & 726/B2A	Black Granite 15% Recovery 5 years Production 4049m^3

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS

No: 1/213-B, Ground Floor, Natesan Complex
Oddapatti, Collectorate Post office,
Dharmapuri-636705. Tamil Nadu.
E-mail: info.gtmsdpi@gmail.com,
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NABET ACC. NO: NABET/EIA/23-26/RA 0319
Valid till: 31.12.2026

ENVIRONMENTAL LAB

GREEN LINK ANALYTICAL AND RESEARCH LABORATORY (INDIA) PVT LTD

No:414/1, Tex Park Road, Coimbatore,

Tamil Nadu Accreditation number TC-6144,

valid till 18.05.2025

1. INTRODUCTION

As the proposed Black granite mining project (P1) falls within the quarry cluster of 500 radius with the total extent of 5.25.95ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No. 720/3(B), 725/1(P), 725/2A, 726/B1(P) & 726/B2A over the extent of 1.36.45ha is situated in the cluster falling in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu. The quarries involved in the calculation of cluster extent are one proposed quarry and one existing quarry.

2. PROJECT DESCRIPTION

The proposed project area is located between Latitudes from 12°27'36.97907"N to 12°27'40.50501"N Longitudes from 77°47'0.03493"E to 77°47'9.65484"E in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District and Tamil Nadu. According to the approved mining plan, about 4049m^3 of Black granite 15% recovery and Granite waste 85% of 22951m^3 will be mined up to the depth of 13m BGL in the five years. The quarrying operation is proposed to be carried out by open cast manual mining method involving drilling and formation of benches of the prescribed dimensions.

3. DESCRIPTION OF THE ENVIRONMENT

Baseline data were collected to evaluate the existing environmental condition in the core and buffer areas during March – May 2024 as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified ***Greenlink Analytical and Research Laboratory (India) Private Ltd*** for the environmental attributes including soil, water, noise, air and by FAEs for ecology and biodiversity, traffic, and socio-economy.

3.1 Land Environment

Land use pattern of the area of 5 km radius was studied using Sentinel II imagery. LULC types and their extent are given in Table 11.1.

Table.11.1 LULC Statistics of the Study Area

S. No	Classification	Extent (ha)	Area (%)
1	Crop Land	4009.10	52.52
2	Dense Forest	226.94	2.97
3	Fallow land	2497.06	32.67
4	Land with or without scrub	590.93	7.74
5	Mining / Industrial lands	6.84	0.09
6	Plantations	121.01	1.59
7	Settlements	123.30	1.62
8	Water Bodies	65.71	0.86
Total		**7634.04**	**100**

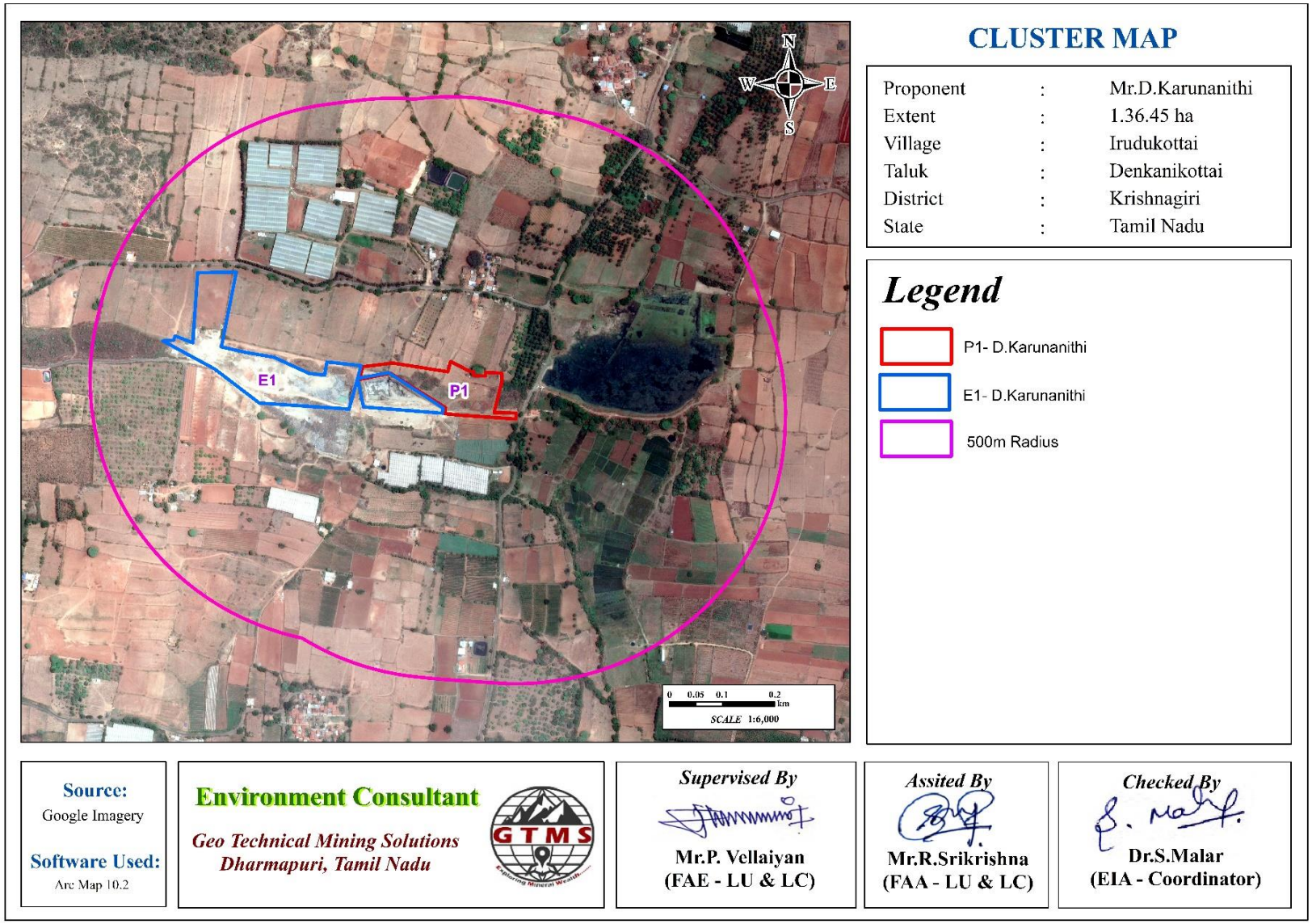

Figure 1. Google Earth Image Showing Lease Area with Pillar

3.2 Soil Characteristics

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and sandy loam. pH of the soil varies from 6.4 to 7.9 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 43.85 to 119.2 µs/cm. Potassium ranges between 1334 and 5632, Calcium ranges between 4455 and 7508 mg/kg. Organic matter content ranges between 0.07 and 0.23%.

Soil erosion

Soil erosion map shows that:

- Soil erosion is low moderate in the proposed lease area

3.3 Water Environment

Surface Water Resources and Quality

Duglipuram lake are the one prominent surface water resources present in the study area. These are ephemeral in nature, which convey water only after rainfall events. One surface water sample, known as SW1 were collected from the one surface water bodies to assess the baseline water quality.

Ground Water Resources and Quality

Groundwater in the study area occurs in the Study area is mainly composed of biotite hornblende genesis and grey hornblende biotite genesis. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose. Five groundwater samples, known as BW1, BW2, OW1, OW2 and OW3 were collected from open well and bore well and analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water.

3.4 Air Environment

As per the monitoring data, $PM_{2.5}$ ranges from 13.8 µg/m^3 to 15.8 µg/m^3; PM_{10} from 36.4 µg/m^3 to 41.6µg/m^3; SO_2 from 2.6µg/m^3 to 4.0µg/m^3; NO_X from 7.2 µg/m^3 to 11.1 g/m^3. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

3.5 Noise Environment

Noise level in core zone was 39.8dB (A) Leq during day time and 33.4dB (A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 39.0 to 44.2 dB (A)

Leq and during night time from 36.8 to 39.4 dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

3.6 Biological Environment

The study found that there is no endemic, endangered migratory fauna found in the area. This area is not also a migratory path of any faunal species. Hence, this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

Flora in core zone

The mine lease area contains total of 17 species belonging to 13 families have been recorded from the mine lease area. 5 shrubs, 12 herbs were identified. It is a grassy land. There are trees in mine lease area. There are no endangered species in mine lease area

Flora in 300m radius zone

The 300m radius area is containing a total of 43 species belonging to 25 families have been recorded from the buffer zone. 15 Trees, 7 Shrubs and 21 Herbs and Climbers were identified.

Flora in 10km radius buffer zone

Similar type of environment also in buffer area but with more flora diversity compare than core zone area. It contains a total of species belonging to 39 families have been recorded from the buffer zone. The floral (80) varieties among them 31 Trees, 11 Shrubs, Herbs and Climbers, Creeper, Grass & Cactus, 38 were identified

Fauna in Core Zone

A total of 26 varieties of species observed in the Core zone of Irudukottai Village, among them numbers of Insects 10, Reptiles 3, Mammals 4 and Avian 9. A total of 26 species belonging to 18 families have been recorded from the core Zone. There is no schedule I and II species. A total of 10 species of bird were sighted in the study area

Fauna in Buffer Zone

Taxonomically a total of 82 species belonging to 49 families have been recorded from the buffer zone area. Based on habitat classification the majority of species were Birds 50, followed by insects 13, reptiles 11, mammals 5 and amphibians 3. A total of 50 species of bird were sighted in the buffer zone. There are no critically endangered, endangered, vulnerable and endemic species were observed.

3.7 Socio Economic Environment

The proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area, thus leading to the improvement of people's standard of living.

4 Anticipated Environmental Impacts and Mitigation Measures

4.1 Land Environment

Anticipated Impact

- Permanent change on land use and land cover.
- Change in topography of the mine lease area.
- Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles.
- Degradation of the aesthetic environment of the core zone due to quarrying
- Soil erosion and sediment deposition in the nearby agricultural fields during the rainy season
- Increase in agricultural productivity of land when mine water is discharged to the surrounding lands for irrigation.

Mitigation Measures

- Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt
- At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.
- In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help minimize dust emissions.
- Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 Water Environment

Anticipated Impact

- Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- As the proposed project acquires 3.0 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

Mitigation Measures

- Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes
- Domestic sewage from site office will be discharged in septic tank and then directed to soak pits
- Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse
- The garland drainage will be connected to settling tank and sediments will be trapped in the settling tanks and only clear water will be discharged to the natural drainage
- Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted
- Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program

4.3 AIR ENVIRONMENT

Anticipated Impact

- During mining at various stages of activities such as excavation, drilling and transportation of materials, particular matter (PM), gases such as sulphur dioxide, oxides of nitrogen from vehicular exhaust are the main air pollutants.
- Emissions of noxious gases due to incomplete detonation of explosive may sometimes pollute the air.
- The fugitive dust released from the mining operations may cause effect on the mine workers who are directly exposed to the fugitive dust.
- Simultaneously, the air-borne dust may travel to longer distances and settle in the villages located near the mine lease area

Mitigation Measures

- To control dust at source, wet drilling will be practiced. Where there is a scarcity of water, suitably designed dust extractor will be provided for dry drilling along with dust hood at the mouth of the drill-hole collar
- Dust mask will be provided to the workers and their use will be strictly monitored
- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- Transportation of material will be carried out during day time and material will be covered with tarpaulin

- The speed of tippers plying on the haul road will be limited to < 20 km/hr to avoid generation of dust
- The un-metaled haul roads will be compacted weekly before being put into use
- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Haul roads and service roads will be graded to clear accumulation of loose materials
- Planting of trees all along main mine haul roads and around the project site will be practiced to prevent the generation of dust
- Dust mask will be provided to the workers and their use will be strictly monitored

4.4 Noise Environment

Anticipated Impact

Total noise level in all the sampling areas is well below the CPCB standards for industrial and residential areas.

Mitigation Measures

- Usage of sharp drill bits while drilling which will help in reducing noise;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- Green Belt will be developed around the project areas and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured though training and awareness.
- Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects

4.5 Biological Environment

Anticipated Impact

- There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region.

- The mine lease area contains total of 17 species belonging to 13 families have been recorded from the mine lease area. 5 shrubs, 12 herbs were identified. It is a grassy land. There are trees in mine lease area. There are no endangered species in mine lease area. The survival rate of uprooted trees is 30% Quarry so instead of one tree 10 saplings are bought and planted in 7.5 conservation zone.

Carbon released from quarrying machineries and tippers during quarrying would be 35 kg per day, 9389 kg per year and 46945 kg over five years

Mitigation Measures

- During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- Existing roads will be used; new roads will not be constructed to reduce impact on flora.
- carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- As per the greenbelt development plan as recommended by SEAC (Table 4.11), about 682 trees will be planted within three months from the beginning of mining. The trees which are planted in the mine lease area can sequestration 61kg of carbon per day but the carbon which is emitted is of about 35kg and these trees are enough to sequestrate the carbon.

4.6 Socio Economic Environment

Anticipated Impact

- Dust generation from mining activity can have negative impact on the health of the workers and people in the nearby area
- Approach roads can be damaged by the movement of tippers
- Increase in Employment opportunities both direct and indirect thereby increasing economic status of people of the region.

Mitigation Measures

- Good maintenance practices will be adopted for all machinery and equipment, which will help to avert potential noise problems
- Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines
- Air pollution control measure will be taken to minimize the environmental impact within the core zone

- For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc.., from this project directly and indirectly

4.7 Occupational Health

- All the persons will undergo pre-employment and periodic medical examination
- Employees will be monitored for occupational diseases by conducting medical tests: General physical tests, Audiometric tests, Full chest, X-ray, Lung function tests, Spiro metric tests, Periodic medical examination – yearly, Lung function test – yearly, those who are exposed to dust and Eye test
- Essential medicines will be provided at the site. The medicines and other test facilities will be provided at free of cost.
- The first aid box will be made available at the mine for immediate treatment. First aid training will be imparted to the selected employees regularly. The lists of first aid trained members shall be displayed at strategic places.

5 Environment Monitoring Program

Table 11.2 Environment Monitoring Program

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, $PM_{2.5}$, PM_{10}, SO_2 and NO_x.
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in m BGL

5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During operation	Peak particle velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	–	Once in six months	Physical and chemical characteristics
8	Greenbelt	Within the project area	Daily	Monthly	Maintenance

Source: Guidance of manual for mining of minerals, February 2010

6 ADDITIONAL STUDIES

6.1 Risk Assessment

The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for proposed project.

6.2 Disaster Management Plan

The objective of the disaster management plan is to make use of the combined resources of the mine and the outside services to:

- Rescue and treat casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Secure the safe rehabilitation of affected area; and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

6.3 Cumulative Impact Study

The results on the cumulative impact of the four proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.

- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time
- PPV resulting from the proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s

- The proposed project will allocate Rs.10,00,000/- towards CER as recommended by SEAC
- The proposed project will directly provide jobs to 22local people, in addition to indirect jobs.
- The proposed project will plant 682 about trees in and around the lease area.
- The proposed project will add 18 PCU per day to the nearby roads.

7. Project Benefits

Various benefits are envisaged due to the proposed mine and benefits anticipated from the proposed project to the locality, neighbourhood, region and nation as a whole are:

- Direct employment to 22 local people.
- Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- Strengthening of existing community facilities through the Community Development Program.
- Skill development & capacity building like vocational training.
- Rs, 10,00,000 will be allocated for CER

8. ENVIRONMENT MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of **Rs.3829722** as capital cost and **Rs. 1107474** as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the total recurring cost over 5 years is Rs. 6119494 and the overall EMP cost for 5 years will be Rs. 9949216.