EXECUTIVE SUMMARY OF DRAFT EIA EMP REPORT

1.0 INTRODUCTION
M/s. K R Associates is planning to set up 500 TPD clinker (Rotary Kiln) unit and 500 TPD Cement grinding (closed circuit) at Dag No. 141, 142, 143, 144, 145, 146 & 151, Patta No. 3, 19, 21 & 9, Village Ambher, 12th mile, Jorabat, Mauza Sonapur, District Kamrup, Assam.
Category of the project is B under 3(b), (Cement Plants < 1.0 million tones/annum production capacity. All stand alone grinding units) but due to presence of Interstate boundary and Wild life sanctuary within 10 km radius of the project site. It has been be treated as category A project, as per Environmental Impact Assessment (EIA) Notification dated 14th September, 2006 and its subsequent.

1.1 PROJECT COST
The total Project Cost is Rs. 148.50 crore, it includes site development, building, all the plant machinery and its installation and Environment Protection measures cost. Total capital cost for environmental pollution control measures would be Rs. 5.02 crore and Recurring cost per annum would be Rs. 0.74 crore.

1.2 REQUIREMENTS FOR THE PROJECT
Land: Around 26,850.0 m² private land is already acquired for the proposed Cement plant.

Water: Total water requirement of the proposed project is 17.6 KL/day which shall be met through ground water using bore well.

Electrical Energy: The estimated power requirement for the proposed project would be 3600 KW. Power will be sourced from Assam State Electricity Board.

Fuel: For the proposed cement plant 100 lit/hr diesel will be required to run stand by D. G. Sets. Diesel will source from the nearest petrol pump.

Manpower: Technically skilled / semi skilled and unskilled manpower is readily available in the area for establishment of the project. It is expected that there will be no dearth in availability of the required personnel for the proposed unit. Total 110 personals shall be employed for the proposed project.

Raw Material Consumption Its Source, Availability & Transportation: The main raw material for the proposed project are limestone (520 Tonne/Day), Clay (60 Tonne/Day), Iron Dust (6.67 Tonne/Day) Coal (80 Tonne/Day), Fly Ash/Slag (96 Tonne/Day) and Gypsum (12 Tonne/Day). Lime Stone and Coal will be procured from the private mine owners located in Meghlaya and Assam, Fly Ash/slag from power plant located at West Bangal, Odisha, Jharkhand & Bihar, Gypsum from Bhutan. All the raw materials will be transported through trucks by road.

1.3 BRIEF PROCESS DESCRIPTION
Cement is typically made from limestone and clay or shale. These raw materials are extracted from the quarry crushed to a very fine powder and then blended in the correct proportions. This blended raw material is called the 'raw feed’ or 'kiln feed' and is heated in a rotary kiln where it reaches a temperature of about 1,400 C to 1,500 °C. In its simplest form, the rotary kiln is a tube up to 200 meters long and perhaps 6 meters in diameter, with a long flame at one end.

The raw feed enters the kiln at the cool end and gradually passes down to the hot end, then falls out of the kiln and cools down. The material formed in the kiln is described as 'clinker' and is typically composed of rounded nodules between 1mm and 25mm across. After cooling, the clinker pass to the cement mill. The cement mill grinds the clinker to a fine powder. A small amount of gypsum a form of calcium sulfate is normally ground up with the clinker. The gypsum controls the setting properties of the cement when water is added.

1.4 SOURCES OF POLLUTION AND CONTROL MEASURES
The particulate emissions are among the most significant impacts of cement manufacturing.
1.4.1 Air environment:

Process Emission: There will be emission of particulate matter, Sulphur Dioxide and Nitrogen Oxide due to operation of Crusher, Hopper, Kiln, Cement Mill, packing section, etc.

Utility Emission: Tow D. G. set is proposed to fulfill power requirement in case of power failure. Emission from these sources will not be continuous as the D. G. sets will be used during emergency or in case of power failure.

Fugitive Emission: The fugitive dust emissions from the proposed plant would be significant and the sources will be as under:
1. Raw materials handling
2. Storage area
3. Materials transfer points (bucket elevators, conveyor belts)
4. Packing of cement
5. Loading and Unloading operations
6. Transportation of vehicles

Air Pollution Control Measures
The major sources of pollution are particulate matter along with Sulphur Dioxide and Nitrogen Oxide from the proposed cement plant.

The details of proposed stacks and air pollution control equipments are as under.

<table>
<thead>
<tr>
<th>NO. OF STACK</th>
<th>STACK ATTACHED TO</th>
<th>POLLUTION CONTROL EQUIPMENT</th>
<th>STACK HEIGHT</th>
<th>STACK DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Emission &amp; its control measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>L/S Crusher</td>
<td>Reverse pulse jet type Bag Filter</td>
<td>30 M</td>
<td>0.73 M</td>
</tr>
<tr>
<td>2.</td>
<td>Hopper</td>
<td>Reverse pulse jet type Bag Filter</td>
<td>30 M</td>
<td>0.60 M</td>
</tr>
<tr>
<td>3.</td>
<td>Raw Mill &amp; Kiln</td>
<td>Twin cyclone Separator followed by Reverse pulse jet type bag filter</td>
<td>78 M</td>
<td>2.05 M</td>
</tr>
<tr>
<td>4.</td>
<td>Blending Silo</td>
<td>Reverse pulse jet type Bag Filter</td>
<td>30 M</td>
<td>0.5 M</td>
</tr>
<tr>
<td>5.</td>
<td>Cooler Exhaust Stack</td>
<td>Electrostatics Precipitator</td>
<td>30 M</td>
<td>1.47 M</td>
</tr>
<tr>
<td>6.</td>
<td>Clinker Stockpile</td>
<td>Reverse pulse jet type Bag Filter</td>
<td>30 M</td>
<td>0.8 M</td>
</tr>
<tr>
<td>7.</td>
<td>Hopper</td>
<td>Reverse pulse jet type Bag Filter</td>
<td>30 M</td>
<td>0.60 M</td>
</tr>
<tr>
<td>8.</td>
<td>Cement Mill</td>
<td>Twin cyclone Separator followed by Reverse pulse jet type bag filter</td>
<td>30 M</td>
<td>0.75 M</td>
</tr>
<tr>
<td>9.</td>
<td>Packing House</td>
<td>Twin cyclone Separator followed by Reverse pulse jet type bag filter</td>
<td>30 M</td>
<td>0.8 M</td>
</tr>
<tr>
<td>10.</td>
<td>Coal Mill</td>
<td>Reverse pulse jet type Bag Filter</td>
<td>30 M</td>
<td>0.8 M</td>
</tr>
</tbody>
</table>

Utility Emission & its control measures

<table>
<thead>
<tr>
<th>NO. OF STACK</th>
<th>STACK ATTACHED TO</th>
<th>POLLUTION CONTROL EQUIPMENT</th>
<th>STACK HEIGHT</th>
<th>STACK DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>2 nos. of D. G. Sets (600 KVA &amp; 250 KVA) For emergency</td>
<td>Acoustic Enclosure</td>
<td>9 M</td>
<td>0.3 M</td>
</tr>
</tbody>
</table>

Fugitive Emission Control measures:
To control fugitive emissions, the following measures are proposed.
- Raw materials loading and unloading will be done in the covered area.
- Raw materials will be stored in the covered structure.
- All the conveyors will be provided with conveyor cover.
- The automatic bagging machine will be provided. The suction of bag filter will be provided at the packing section.
- The sprinkling of water will be done along the internal roads in the plant in order to control the dust.
- All the workers and officers working inside the plant will be provided with disposable dust masks.
- Green belt will be developed around the plant to arrest the fugitive emissions.
- Bag filter will be cleaned regularly.
- Maintenance of air pollution control equipments will be done regularly.
1.4.2 Water Environment:
*Waste water generation and mitigation measure*

There will be no waste water generated due to the process. Only domestic wastewater will be generated which is 17.6 KL/day. The domestic waste water shall be diverted into a septic tank followed by soak pit/well.

1.4.3 Noise environment:
The noise levels near the sources such as crusher, cement mill, D. G. Sets, material handling, loading unloading, etc. will be higher during the operational phase but general noise levels within plant are expected to remain below 75 dB(A). In order to mitigate the noise levels during the operational phase effective noise control measures like encaissement of noise generating equipments, a thick greenbelt will be developed all around the plant boundary to act as noise attenuator, proper and suitable acoustic barrier will also be provided around areas generating high noise and effective preventive maintenance and vibration measurement of all rotating equipment will be taken.

1.4.4 Solid waste generation and its disposal method

Dust collected from air pollution control equipment will be 100% recycled in the process. Other solid wastes will be used/spent oil and discarded drums and bags. The sources of solid wastes, generation and its management are as given in the following table.

<table>
<thead>
<tr>
<th>SR. NO.</th>
<th>TYPE OF HAZARDOUS WASTE</th>
<th>SOURCE</th>
<th>QUANTITY</th>
<th>WASTE MANAGEMENT DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>COLLECTION</td>
</tr>
<tr>
<td>1.</td>
<td>Used/spent Oil</td>
<td>Prime Movers</td>
<td>20 ltrs HDPE Drums</td>
<td>Reuse in plant for lubrication</td>
</tr>
<tr>
<td>2.</td>
<td>Discarded Bags</td>
<td>Storages</td>
<td>30,000 nos. Bags</td>
<td>-</td>
</tr>
</tbody>
</table>

1.5 BASELINE ENVIRONMENTAL STATUS

The baseline environmental quality of Air, water, soil, noise, socioeconomic status and ecology has been assessed in the post monsoon season (November 2014 to January 2015) in a study area of 10 km radial distance from the project site.

1.5.1 Air Environment:
The ambient air samples were collected from eight locations and analyzed for PM$_{2.5}$, PM$_{10}$, SO$_2$, NO$_x$ and CO for identification, prediction, evaluation and assessment of potential impact on ambient air environment. Design of network for ambient air quality monitoring location was based on guidelines provided by CPCB. The arithmetic mean values of PM$_{2.5}$, PM$_{10}$, SO$_2$, NO$_x$ and CO are found within permissible limit at all the locations.

1.5.2 Water Environment:
To assess water quality, surface water and ground water samples were collected from eight different locations. Results of all the water parameters were found within permissible limit.

1.5.3 Noise Environment:
Ambient noise level monitoring was done at same locations where ambient air monitoring was carried out. The noise levels of the study are found low and within the stipulated standards of CPCB for the respective designated areas.

1.5.4 Soil Environment:
The general topography of the study area varies from low-lying plains to highland having small-hillocks. Soil samples were collected from eight different locations and physico-chemicals properties were analyzed. All the parameters are found within limit.

1.5.5 Socioeconomic Environment:
Baseline information of socio-economic data has been collected from Census 2001 for the four major indicators viz. demography, civic amenities, economy and social culture, literacy, occupational structure.
1.5.6 Ecology:
Keeping in view, the importance of biological component of total environment due to the proposed project, biological characterization of terrestrial and aquatic environments, changes in species diversity of flora and fauna in terrestrial as well as aquatic systems were studied for impact analysis due to proposed project activity. The details of flora/fauna species and the wildlife habitat in the area covering 10 km radius have been collected to determine the existence of rare and/or endangered species. One sanctuary (i.e. Amchang Wildlife Sanctuary) and four reserved forests (i.e. Mylliem, RF, Marakdola RF, Khanapara RF and Garbhanga RF) present within the study area. There is no place of archeological/ historical/ religious/ tourist interest within 10 km radius of the plant.

1.6 ENVIRONMENTAL IMPACT ASSESSMENT

1.6.1 Air Environment:
The increase in ground level concentrations due proposed project will be as following. With the following values if superimposed on the baseline concentrations, the post project ambient air quality found to be well within the National Ambient Air Quality Standards (NAAQ) except project.

<table>
<thead>
<tr>
<th>NO.</th>
<th>PARAMETERS</th>
<th>MAXIMUM INCREMENTAL GROUND LEVEL CONCENTRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>PM$_{10}$</td>
<td>19.4</td>
</tr>
<tr>
<td>2.</td>
<td>SO$_2$</td>
<td>20.5</td>
</tr>
<tr>
<td>3.</td>
<td>NO$_x$</td>
<td>19.3</td>
</tr>
</tbody>
</table>

1.6.2 Water environment:
Only domestic waste water 3.6 KL/day shall be generated which will treated through septic tank and disposed off through Soak Pit/well. Rain water harvesting shall be carried out to recharge ground water which can improve water environment of the area. So, no adverse impact of proposed activities, on water quality is envisaged.

1.6.3 Land environment:
Used/spent oil and Discarded Bags shall be generated as solid waste from the proposed project. These waste will be properly disposed as environmental friendly. So, there will be no significant impact on land environment.

1.6.4 Noise environment:
The main sources of noise pollution in the plant would be crusher, cement mill, diesel generator and vehicular movement. Adequate noise control measures such as mufflers, silencers at the air inlet/outlet, anti vibration pad for equipment with high vibration, earmuff and earplugs to the operators etc. will be provided. However, the proposed green belt will help to reduce noise level. The adverse impact on occupationally exposed workers will not envisaged, as noise protection devices will be provided.

1.6.5 Ecological environment:
No vegetation cover will be disturb during construction activities. More over a thick greenbelt will be developed around the boundary wall of the project site. Due to the proposed project air level of air pollutants will be increase but overall level of pollutants will be remain within national Ambient air quality standards. However a wild life conservation plan will be prepared and implemented.

1.6.6 Socioeconomic environment:
Over all 75 persons will get direct or indirect employment due to proposed project. In addition to these company will contribute in socio economic development of the area.

1.7 ENVIRONMENTAL MANAGEMENT PLAN

1.7.1 Air Environment
- All transfer points will have bag filter attached to them to control and capture dust emission.
- Height of all the stacks will be as per statutory requirement.
- Regular stack monitoring will be carried and records will be maintain
- All the stacks will have Stack Monitoring Facility (SMF) consisting of sampling port-hole, platform and access ladder.
- Adequate spares of critical components of dust collection systems will be kept to ensure trouble-free operations and continuous compliance to emission norms.
- Transport vehicles will be properly maintained to reduce air emissions.
- Vehicles will be periodically checked for pollutant emissions against stipulated norms.
- Idle running of vehicles will be minimized during material loading / unloading operations.

1.7.2 Water Environment
- Record of the water consumption will be maintain
- Domestic waste water will be treated in septic tank and disposed off through soak pit/well.
- Rain water harvesting will be done to recharge ground water or store for future use.

1.7.3 Noise Environment
- Sheet metal casting and housing will be insulated with sound absorbing materials
- Noise generating sources and their platforms will be maintained properly to minimize noise vibrations generated by them.
- Personnel working near the noisy machines in different plant locations, will be provided with well designed ear muffs/plugs (effective noise reduction upto 10-15 dBA)
- Cement mill premises will have proper ventilation.
- Green belt will be developed to act as a noise barrier.
- Noise barriers in the form of walls, beams will be provided around the units wherever found feasible.
- Training to personnel will be imparted to generate awareness about effects of noise and importance of using PPEs (Personal Protective Equipment).

1.7.4 GREEN BELT DEVELOPMENT
About 8,860 Sq. mt. area i.e. 33% land area of total land shall be developed as greenbelt/green cover development at the proposed project site. Proper budgetary provision considering expenses incurred on saplings, soil handling, manuring, after care and maintenance will be made.

1.7.5 ENVIRONMENT MANAGEMENT CELL
In addition to preparing an Environment Management Plan (EMP), it is also necessary to have a permanent organizational set up to ensure its effective implementation. Hence company will establish a team consisting of officers from various departments to co-ordinate the activities concerned with management and implementation of the environmental control measures. This team will undertake the activity of monitoring the stack emissions, ambient air quality, noise level etc. either departmentally or by appointing external agencies wherever necessary. Regular monitoring of environmental parameters will be carried-out to find out any deterioration in environmental quality and also to take corrective steps, if required, through respective internal departments.

1.8 CSR PLAN WITH PROPOSED EXPENDITURE
To uplift the economic status of the surrounding villages, KRA will take up the following social welfare/development programmes for the villages in the vicinity, for which Rs. 3.72 crores is earmarked and will be utilized within 5 years.

- Eradicating hunger, poverty and malnutrition, promoting preventive health care and sanitation and making available safe drinking water.
- Promoting education, including special education and employment enhancing vocation skills especially among children, women, elderly, and the differently abled and livelihood enhancement projects.
- Promoting gender equality, empowering women, setting up homes and hostels for women and orphans, setting up old age homes, day care centres and such other facilities for senior citizens and measures for reducing inequalities faced by socially and economically backward groups.
- Ensuring environmental sustainability, ecological balance, protection of flora and fauna, animal welfare, agroforestry, conservation of natural resources and maintaining quality of soil, air and water.
- Protection of national heritage, art and culture including restoration of buildings and sites of historical importance and works of art; setting up public libraries; promotion and development of traditional arts and handicrafts.
- Measures for the benefit of armed forces veterans, war widows and their dependents.
- Training to promote rural sports, nationally recognised sports, paralympic sports and Olympic sports;
- Contribution to the Prime Minister's National Relief Fund or any other fund set up by the Central Government for socio-economic development and relief and welfare of the Scheduled Castes, the Scheduled Tribes, other backward classes, minorities and women.
- Contributions or funds provided to technology incubators located within academic institutions which are approved by the Central Government.

1.9 OCCUPATIONAL HEALTH AND SAFETY PROGRAM
- All measures related to safety such as safety appliances, training, safety awards, posters, slogans will be undertaken.
- The health of the workers will be regularly checked by a well qualified doctor and proper records will be kept for each worker.
- The factory will take all reasonably practicable measures to minimize the risk of such accident in compliance with the legal obligation under the relevant safety.
- All building plans and installations are as per relevant acts and duly approved by competent government authorities.
- Training of workers and Staff for fire fighting, first aid, safe handling and integrating safety, in all activities.
- Accident/Incident reporting system and information of employees about the same for better awareness.
- Suitable notices/boards displayed at several locations indicating appropriate hazards warning as well as DO’s and DON’T for ensuring operational and personal Safety for information of workers/staff and visitors.
- For the safety of the workers, personal protective equipments like hand gloves, helmets, safety shoes, goggles, aprons etc. & Ear protecting devices like earplugs/ earmuffs will be provided. Nose mask will be provided at places, where there is possibility of dust generation.

1.10 POST PROJECT ENVIRONMENT MONITORING PROGRAM
EMP also details the Post Project Monitoring to be undertaken by the plant authorities in order to maintain environmental quality within the stipulated standard limits specified by State Pollution Control Board, CPCB and Ministry of Environment and Forests.

M/s. K R Associates will establish a dedicated Environmental cell to monitor and analyze the various environmental components of the cement plant.
- Continuous Emission Monitoring at all the major stacks for continuous monitoring.
- The wastewater samples will be collected regularly both at inlet and outlet of sewage treatment plant to assess the performance and compliance as per the norms.
- Full-fledged environmental laboratory will be established in the plant.
- Regular noise monitoring at all the high noise generating area
- Ambient air quality monitoring in nearby villages