

EXECUTIVE SUMMARY

For

**6.88 LAKHS TONNES PER ANNUM LIMESTONE
PRODUCTION**

At

UMSOO-MOOTANG LIMESTONE MINE (BLOCK-III)

**Umsoo-Mootang Area, Thangskai Village, Narpuh Elaka, P.O.
Lumshnong in East Jaintia Hills District, Meghalaya**

**CAPTIVE LIMESTONE MINE : 4.90 HA
PRIVATE LAND (DEEMED FOREST AREA)**

OF

M/s. ADHUNIK CEMENT LIMITED

(Subsidiary of Dalmia Cement (Bharat) Ltd.)

August, 2016

EXECUTIVE SUMMARY

1.1 INTRODUCTION

M/s Adhunik Cement Limited (ACL), a wholly owned subsidiary of Dalmia Cement (Bharat) Limited (DCBL), proposes to produce 6.88 Lakh Tonnes per Annum (LTPA) of limestone from , Mining Lease area of 4.90 Ha (Block-III) located in Umsoo-Mootang Area, Thangskai Village, Narpuh Elaka, P.O. Lumshnong in East Jaintia Hills District, Meghalaya State. This mining Lease is one of the Captive Limestone Mine which will meet part limestone requirement of ACL's Integrated Cement plant of 1.3 MTPA Clinker capacity. Environmental Clearance for the Cement plant has been obtained from the Ministry of Environment and Forest & Climate Change (MoEF&CC), New Delhi and the Cement Plant is in operation. Limestone requirement of the cement plant is currently met from Block – I, II and IV each measuring 4.9 ha by adopting opencast mechanized method of mining. In addition, proposed ML Block III (4.9 ha) and V (128.52 ha) are yet to be granted mining lease.

The area of ML Block III is less than 5 ha and as per the provisions of SO. 1533 dtd. 14th Sept, 2006 or amendment SO 3067 (E) dtd 1st Dec. 2009, or S.O. 2731 (E) dtd 9th Sept. 2013, Environmental Clearance is not required for the MLs having area less than 5 ha. It is only vide amendment S.O. 2601 (E) dtd. 07th Oct. 2014, mining lease <50 ha area in respect of non-coal mine lease were brought under the purview of EIA Notification, 2006. As per this notification, the proposed Mining Lease of 4.90 Ha is categorized as **Category – 'B'** project which necessitates obtaining the Environmental Clearance from State Environment Impact Assessment Authority (SEIAA), Meghalaya.

The Narpuh RF was declared as Wild Life Sanctuary by Govt. of Meghalaya vide Notification no FO:128/2013/20 dated 10th June 2014. MoEF&CC has notified the Eco-Sensitive boundary of Narpuh WLS by the draft Gazette Notification SO:3124 (E) dated 20th Nov 2015. The lease boundary is about 6.18 km -SSE from Pillar no NP-13 of Narpuh Sanctuary and 6.06 km-SSE from pillar no-6 of Eco-Sensitive Zone of Narpuh WLS. Hence as per the amendment in EIA Notification, 2006 vide SO 1599 dated 25th June 2014, the proposed project is categorized as 'B' category.

1.2 PRESENT PROPOSAL

ACL proposes to produce 6.88 LTPA of Limestone from the mining Lease (Block-III) located in Umsoo-Mootang Area, Thangskai village, Narpuh Elaka, East Jaintia Hills District, Meghalaya. The Mining Lease is spread over an area of 4.90 ha which is a private land (deemed Forest Area) and is one of the captive source of limestone for the interlinked cement plant of ACL.

LOI was granted by the State Government of Meghalaya vide letter No – MG/2/2009/141 dated 22nd June 2009. Mining Plan of the proposed mine has been approved by Indian Bureau of Mines vide letter no 314(3)/2009-MCCM(CZ)/MP-21 dated 3rd Dec 2009. The Mining lease area fall under the deemed forest land and Stage – II approval for the deemed forest land was obtained vide letter no. 3-MG B 059/2012-SHI/6632-33 dated 05th March, 2014. Rs. 35,77,000/- as Net Present Value (NPV), Rs. 2,59,263/- for Compensatory Afforestation (CA) and Rs. 68,190/- for Safety Zone CA have already been deposited into Ad-hoc CAMPA of Forest Department.

The mine will be operated by the conventional open cast mechanized method of mining, which includes drilling, blasting, loading and transportation.

The project cost of Mining is Rs. 150 lakhs. A combined budgetary allocation of Rs. 100 lakhs is proposed for the entire area covering mining lease blocks I, II, III, IV and V of the same PP for implementation of the environmental management plan and Rs. 17 lakhs/annum is proposed as Recurring cost. Additional provision of Rs. 232 lakhs is kept for implementation of various environmental mitigative measures during the pendency of lease period of all MLs. A provision of Rs. 58.098 lakhs is also kept as per the approved plan for conservation of bio-diversity and schedule-I species in the Buffer zone. Hence, a total of about Rs. 390 lakhs (Rs. 3.9 cr.) has been earmarked for implementation of EMP and various mitigative measures combined for all the leases by the Company.

1.3 DESCRIPTION OF ENVIRONMENT

The study area covers 10 km radius of Umsoo-Mootang limestone mine (Block-III) located near Thangskai village, Narpuh Elaka, East Jaintia Hills District, Meghalaya.

As part of Environmental Impact Assessment study, baseline environmental monitoring was carried out for Summer Season -2016 covering the months of March '16 – May '16.

METEOROLOGY

The predominant wind directions during the season were from the S-SSW-SW sector accounting to about 50.27% of the total time with calm winds of less than 1.0 kmph for about 10.05% Wind speeds during this period were varying between 1-15 kmph and during some of the times the wind speed was recorded more than 15 kmph.

AIR ENVIRONMENT

Ambient air quality of the study area has been assessed through a network of eight ambient air quality locations. The Ambient Air Quality monitored in the study area was found to be well within the limits of NAAQ standards prescribed for Residential, Rural & Other Areas.

Air Quality in the study area (All the values are in $\mu\text{g}/\text{m}^3$)

Code No	Location Name	98 th Percentile values			
		PM ₁₀	PM _{2.5}	SO ₂	NO _x
A1	Mine site	53.5	25.4	9.1	10.9
A2	Plant Site	54.0	26.8	9.7	11.8
A3	Thangskai	48.3	22.9	8.4	9.7
A4	Lumshnog	45.9	21.0	9.5	10.2
A5	Pynurkha	49.7	20.6	10.3	11.0
A6	Umswng	47.8	21.7	7.9	9.1
A7	Wahkmar	51.2	24.2	8.1	9.3
A8	Mynkree	46.2	19.8	8.9	10.0
NAAQ Standards for Industrial, Residential, Rural and Other Areas		100	60	80	80

Note: CO values are observed less than 1 ppm during study period.

NOISE ENVIRONMENT

Eight monitoring locations were selected to assess the noise levels in the study area. Noise levels recorded were found to be in the range of 50.6 - 61.3 dB (A) during daytime and in the range of 40.8 – 55.1 dB (A) during night time.

WATER ENVIRONMENT

Six Ground water and two surface water samples each were collected from in and around the study area. The parameters thus analysed were compared with IS -10500. All the samples were found to be well within the limits.

SOIL ENVIRONMENT

Eight soil samples were collected within 10 km radial distance of the study area and were analyzed to study the soil quality.

BIOLOGICAL ENVIRONMENT

There are no endangered category of species in the mine area.

Looking into the biodiversity of the area, a biodiversity conservation plan was prepared and approved by Chief Wildlife Warden, Meghalaya, Shillong. The conservation plan has confirmed that there are no threatened species except for one species of Schedule - I i.e *Bambusicola fitchi hapkinsoni* (common name: Assam Bambo Patridge) belonging to Avi Fauna observed in study area 10 km radius. A total of Rs. 58.098 lakhs has been earmarked for conservation of biodiversity and schedule-I species in the Buffer zone as per the plans approved by Forest Department, Govt.of Meghalaya.

All mining blocks and cement plant of ACL are within the same buffer zone, hence these conservation plans are congruent to all the mines and plant.

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

ACL proposes to produce limestone of 6.88 LTPA from the subject mine.

ACL is operating a Cement Plant of 1.5 MTPA capacity, CPP of 25 MW and Captive Limestone Mines -Block-1, Block-II & Block IV admeasuring 4.9 Ha each with a production capacity of 1.5 LTPA, 2.83 LTPA & 7 LTPA respectively. ML Block V (128.52 Ha, 2.0 MTPA) and proposed Project (Block III) are yet to be operational after grant of Mining Lease.

1.4.1 AIR ENVIRONMENT

Considerable amount of dust will be generated at various stages of mining operation such as drilling, blasting, excavation, loading and transportation of limestone.

The emissions from the operation of existing mines (Block I, II, IV) and plant are represented in the baseline monitored in the core zone and buffer zone during the study period. Hence, for assessment of maximum incremental rise in the ground level concentrations, emissions from ML Block V, which is yet to be operational, are incorporated along with emissions from proposed mine Block III, to assess cumulative impact.

PRODUCTION DETAILS

	LTPA	
	BLOCK - III	BLOCK - V
Limestone	6.88	20.0
Soil	4.28	22.52
Overburden (sandstone)	3.15	
Total Material Handling	14.31	42.52

In order to estimate the resulting ground level concentration for the prevailing meteorological conditions, AERMOD mathematical model was used. The Overall Scenario with predicted cumulative ground level concentrations over the baseline is shown below

OVERALL SCENARIO, $\mu\text{g}/\text{m}^3$

(Sources: Emissions of limestone mine – Block – III & Block - V)

	PM ₁₀ ($\mu\text{g}/\text{m}^3$)
Baseline concentration (max)	54.0
Predicted Concentration (max)	22.0
Overall scenario	76.0
NAAQ limit for Rural and Residential area	100

NOTE: *max of 98th percentile values in parenthesis are National Ambient Air Quality (NAAQ) standard limits

1.4.2 NOISE ENVIRONMENT

Noise produced at the mining lease will be due to drilling, blasting, compressors, pumps, movement of vehicles and other machinery. The

noise generated by the mining activity will be dissipated within a small zone around the mines.

1.4.3 WATER ENVIRONMENT

The total water requirement for the proposed project is estimated to be about 20 m³/day for mining and allied activities.

1.4.4 LAND ENVIRONMENT

Overburden (top soil & sandstone) generation during the life of mine will be about 10.21 Lakh tonnes (4.28 Lakh tonnes - soil + 5.93 Lakh tonnes –sandstone). This waste will be dumped at the earmarked place. Dump height will be about 12 m in two terraces, 6 m height of each and shall be vegetated after soil capping.

IMPACT ON LAND USE

The existing land use pattern of mining lease area is barren land comprising of sparse scrub wherever soil interspersed with limestone.

At the end of the life of mine, the land use pattern in the core zone is likely to be as follows:

POST MINING LAND USE PATTERN OF THE MINING LEASE AREA

S.NO	LAND USE	AREA IN HA
		BLOCK- III
1	Mined-out area with terrace reclamation	4.21
3	Area under barrier zone/greenbelt	0.69
4	Roads & Infrastructure	-
TOTAL		4.90

ACL proposes to take up plantation in the following areas during the life of the mine.

- i) 7.5 m wide statutory barrier zone (0.69 ha),
- ii) Dump area (1.50 Ha) – outside lease

Over 2180 saplings may be planted in course of over 5 years of life time. Horticulture personnel will take all the necessary post-

plantation care in the development of greenbelt and afforestation ensuring maximum survival rate of plants.

1.4.5 GROUND VIBRATIONS

Ground vibration is expected to be generated during blasting. All safety precautions specified by DGMS shall be followed during blasting. Maximum Charge per delay shall be properly adopted to minimize and maintain ground vibrations as per DGMS standards.

1.4.6 IMPACT ON FLORA & FAUNA

The mining lease area of 4.90 ha of Block – III is barren lands comprising of sparse scrub which is a private land (deemed Forest area). No major floral or faunal species are found in the ML areas.

1.4.7 Environment Management Plan

As the proposed Block III & V and the existing Block IV are adjacent to each other hence a common Environment Management Plan (EMP) is prepared to mitigate the cumulative impacts of the mining operation on the surroundings. The same is summarized in table below:

Common EMP for Proposed ML Block III & Block V and Existing ML Block IV are as below

Sl. No.	Environmental Component	Proposed EMP
1	Air Pollution	<ul style="list-style-type: none">• Use of wagon drill provided with dust collectors.• Wet drilling and Use of sharp drill bits for drilling holes. Charging the holes by using optimum charge and using millisecond delay detonator.• Water sprinkling at regular interval.• Regular grading of haul roads and service roads.• Blasting and excavation operations to be avoided during high windy periods.• Workmen in the work zone to be provided with dust masks.• The vehicles and machinery to be kept in well-maintained condition.• Operator cabins in all items of major HEMM

Sl. No.	Environmental Component	Proposed EMP
		<p>equipment to be enclosed.</p> <ul style="list-style-type: none"> • Proper greenbelt development.
2	Noise	<ul style="list-style-type: none"> • Proper and regular maintenance of vehicles, machinery and other equipment. • Provision of earplugs to the workers. • Carrying out blasting only during day time and not on cloudy days • Limiting time exposure of workers to excessive noise. • Staggered pattern of blasting may be adopted. • Noise levels to be controlled by using optimum explosive charge, proper delay detonators and proper stemming to prevent blow out of holes. • Proper greenbelt development.
3	Water Pollution	<ul style="list-style-type: none"> • Gully plugs and Check Dams at appropriate places for removing the silt from the storm water draining from the mining lease area. • Retaining walls, Garland drains and Silt traps to avoid erosion and siltation. • Mining will not intersect ground water table. • Waste water from workshop will be treated for oil & grease and reused for Green Belt.
4	Ground vibration	<ul style="list-style-type: none"> • Blast holes to be initiated by short delay detonators. • Blasting to be done using sequential blasting machine. • Avoiding excessive confinement of charges. • It is to be ensure that the effective burden is not excessive and the free face is kept effective long. • Number of blast holes per delay to be kept minimum. • Blasting of maximum number of holes towards the free face. • Charge weights per delay to be properly adopted so as to protect different categories of structure surrounding the mining lease area.
5	Safety in Blasting	<ul style="list-style-type: none"> • A blasting SIREN to be used at the time of blasting for audio signal. • Before blasting and after blasting, red and green flags to be displayed as visual signals. • Warning notice boards indicating the time of blasting and NOT TO TRESSPASS to be displayed prominently
6	Solid Wastes	<ul style="list-style-type: none"> • Waste to be dumped at the earmarked places

Sl. No.	Environmental Component	Proposed EMP
		<p>as per approved mine plan.</p> <ul style="list-style-type: none"> • Soil to be used for soil capping of waste dump area for green belt development. • Construction/maintenance of garland drains at foot of dumps and around mine areas. • Saplings to be planted along the foot of the dumps and unused slopes to arrest / prevent erosion.
7	Landscape	<ul style="list-style-type: none"> • Mine closure and reclamation shall be in accordance with the IBM approved Progressive Mine Closure plan.
8	Green Belt	<ul style="list-style-type: none"> • Plantation to be done all along the safety barrier in accordance with the IBM approved Mining Plan. • Local native species to be selected in consultation with DFO for plantation.
9	Flora & Fauna	<ul style="list-style-type: none"> • The measures suggested in the plans approved by the Forest Department, Meghalaya to be implemented as per the implementation schedule defined therein.
10	Occupational Health & Safety	<ul style="list-style-type: none"> • Enclosed Excavators, dumpers, drills and other automated equipment. • Use of all Personal Protective Equipments to be made compulsory • Periodic health checkup as per statutory requirement • Specific periodic personnel training on work-site safety management • Availability of essential medicines and first aid box at the mine office • Provision of AC cabin for HEMM operators. • Provision of ergonomically designed seats for drivers/operators • Provision of illumination facilities at proper places of mines. • Provision of Rest Shelter and drinking water at mines.
11	EMP Budget	
A	EMP	<ul style="list-style-type: none"> • A combined budgetary allocation of Rs. 100 lakhs is proposed for the entire area covering mining lease blocks I, II, III, IV and V of the same PP for implementation of the environmental management plan and Rs. 17 lakhs/annum is proposed as Recurring cost.
B	Mitigative Measures	<ul style="list-style-type: none"> • Additional provision of Rs. 232 lakhs is kept

Sl. No.	Environmental Component	Proposed EMP
		for implementation of various environmental mitigative measures during the pendency of lease period of all MLs.
C	Conservation of Biodiversity	<ul style="list-style-type: none"> Provision of Rs. 58.098 lakhs is kept as per the approved plan for conservation of bio-diversity and schedule-I species in the Buffer zone.

1.4.7 SOCIO ECONOMIC ENVIRONMENT

The mining lease areas of Block – III does not cover any habitation. No public buildings, places, monuments etc., exist within the lease area or in the vicinity. The mining operations will not disturb/relocate any village or need resettlement. The company has planned and implemented various activities for the socio-economic development of the area which are briefly described in subsequent section 1.8 under “*Project Benefits and Socio-Economic Environment.*”

1.5 ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

ACL proposes to adopt conventional open-cast mechanized method of mining in its proposed Limestone Mine. This method involves drilling, blasting, loading and hauling with Heavy Earth Moving Equipment.

Surface Mining cannot be adopted due to hard nature of the limestone available in the mining lease area

1.6 ENVIRONMENTAL MONITORING PROGRAMME

ACL will implement environmental management plan keeping in view the requirements of the Meghalaya State Pollution Control Board and protocol stipulated by CPCB/ IBM/ MoEF&CC. To evaluate the effectiveness of environmental management programme, regular monitoring of the important environmental parameters to be taken up. The monitoring will be taken care by Environmental Cell common for the plant and mines.

ENVIRONMENTAL MANAGEMENT CELL

In order to implement the measures suggested for mitigating the adverse impacts on the environment and undertake routine

monitoring of various environmental components, ACL has set up a fully functional environmental management cell and environmental laboratory at the associated Cement plant. Same facility and manpower is shared with the operating mines and same will be extended to the proposed mining project.

The Cell is under the overall supervision of the Plant Head. The Cell comprises of qualified Environmental Manager and Environmental Engineer for plant and mine.

Basically, this department undertakes environmental monitoring and implementation of EMP either departmentally or by appointing external agencies wherever necessary. The cell is responsible for environmental compliance, management and safety at the unit and associated captive mines.

A combined budgetary allocation of Rs. 100 lakhs is proposed for the entire area covering mining lease blocks I, II, III, IV and V of the same PP for implementation of the environmental management plan and Rs. 17 lacs/annum is proposed as Recurring cost.

**ESTIMATED COST OF ENVIRONMENTAL PROTECTION MEASURES FOR
ENTIRE AREA COVERING MINING LEASE BLOCKS I, II, III, IV AND V
(RS. Lakhs)**

S.NO.		CAPITAL COST	RECURRING COST
1	Air Pollution Control	45	4
2	Water Pollution Control		
3	Noise Pollution Control		
4	Environment Monitoring and Management	12	4
5	Reclamation borrow/mined out area & greenbelt	22	4
6	Occupational Health	9	2
7	Others, Community development measures	12	3
Total		100	17

1.7 PROJECT BENEFITS AND SOCIO-ECONOMIC ENVIRONMENT

As responsible corporate, the parent company Dalmia Cement (Bharat) Limited have always given top most priority for Corporate Social Responsibility in vision and philosophy. The community has been a key stakeholder in business and environmental issues are a matter utmost priority for the company. The Management believes to

being catalyst in the transformation of the communities around its business operations through partnership with local communities, Government, NGO's and other stake holders.

The company shall continue to take such activities under CSR program based on the requirement of the local community. Such activities are taken up on regular basis in consultation with the local community and regulatory bodies.

EMPLOYMENT

ACL will employ local people for carrying out the mining operations. Some of them will be common for all the mines. Being a captive mine of Adhunik Cement Ltd, plant is generating huge opportunity to the people of nearby area. For employment, preference was given for locals based on qualifications & requirement. 44 people are directly employed and another 66 are indirectly employed at existing mines of the company.

SOCIO-ECONOMIC MEASURES

Socio-economic level of the area has been improved directly and indirectly in terms of employment, basic infrastructure facilities, social activities etc.

The initiatives of the Company for community/social development of the surrounding area have been continued with a view to integrate our business operations with social processes while recognising the interests of its stakeholders.

The CSR activities **are being directly implemented by Dalmia Bharat Foundation (DBF)** at all locations in a project-mode, with specified timelines and deliverables.

A Socio Economic Study/Need based assessment was carried out to identify the need of the locals. During the survey, local people were contacted in structured manner covering different class, caste and strata of the community in villages of core and buffer zones.

Mynkree, Lumshnong, Moosianglamarenew, Moosianglamareold, Chiehruhpi, Thangskai, Nongshing, Wahiejar, Umstein, Umlong are

the intervening villages of DBF in Meghalaya for undertaking different socio-economic developmental activities.

Based on the findings of the need assessment exercise conducted in March 2014 and Participatory Rural Appraisals, the strategic focus was aimed at CSR initiatives addressing the material issues which are important for business as well as to neighbouring **communities like Soil and Water conservation, Energy conservation & Livelihood Skill training**. In other words, we linked our CSR programs with the principle of sustainable development.

In the financial year 2014-15, company has incurred about Rs.42 lakhs and in 2015-16 about Rs. 46 lakhs for different programs.

CUMULATIVE PROJECTED BUDGET PROPOSED FOR NEXT 5 YEARS

Based on findings of the study, a combined budgetary allocation of Rs. 245 Lakhs is made for the entire project (Cement plant, Captive Power Plant and it's captive limestone mines Block I, II, III, IV and V) and it is proposed to work on the following program in the next 5 years.

CUMULATIVE PROJECTED BUDGET PROPOSED FOR 5 YEARS (in Rs.)						
CSR Program Areas	2016-17	2017-18	2019-20	2020-21	2021-22	2022-23
Soil and water Conservation	540000	594000	617760	636293	674470	714939
Energy Conservation & Climate Change Mitigation	808000	88800	924352	952083	1009208	1069760
Livelihood Skill Training	234000	257400	267696	275727	292270	309807
Social Development	1842000	2026200	2107248	2170465	2300693	2438735
Program Execution Cost	76000	83600	86944	89552	94925	100621
Total CSR Budget	3500000	3850000	4004000	4124120	4371567	4633861

CONCLUSION

ACL will implement the environment management plan and will take up various socio economic development activities to have the positive impact on the surroundings.