KA PASOH

BAN IOH JINGBIT IA KA ENVIRONMENT CLEARANCE

(Category - B1, under item 1 (a), as per EIA Notification 14th September' 2006 and its subsequent amendments till date)

IA

"UMTYRA LIMESTONE & CLAY DEPOSIT"

Jaka: - Umtyra, Village: Chiehruphi, Sub Post Office Chiehruphi, P.S. Lumshnong District – East Jaintia Hills, Meghalaya.

Jingpynmih ba lah ban pynmih : - 3,58,369 TPA u Mawshun, bad ka jingpynmih ia u Dewbyrtha 1,21,909 TPA, OB kum u syiapmaw 67,622 & syiap khyndew 42,279 TPA.

Jingheh ka Jaka: - 6.7892 Ha;

Jingtipbniah ia ka TOR	**:**	**Issued from SEIAA, Meghalaya**
Baseline data ba la pynmih	**:**	**Nohprah' 2022 to Rymphang, 2023 (Por Tlang)**
Project Jinglut	**:**	**Rs. 804.5 Lacs**

PROMOTER

M/s. Goldstone Cements Limited

Musiang Lamare (Old), District – East Jaintia Hills,State – Meghalaya

ENVIRONMENTAL CONSULTANT

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NABET Accreditation: NABET/EIA/2023/ RA0192 (Rev. 01)

KA PASOH

11.0 KA JINGSDANG.

Ka project ba la kdew "Umtyra Limestone and Clay Deposit" ka ba don ha Umtyra Village, Elaka Cheihruphi, Sub Post Office Chiehruphi, P.S. Lumshnong, District: East Jaintia Hills, Meghalaya Ka jaka baroh ba la mang naka bynta kata ka project ka long 6.7892 ha. Ka rukom tih ia u mar kan long da kaba shu khlong ia ka khyndew da ki kor ki bor bad sa kaba shu ksam shapoh.

Ka Mining and Geology Department, Government of Meghalaya ka la ai bor ia kattei ka jaka ba don ka jingheh kumba 6.7892 hectare na ka bynta ban tih ia u mawshun bad u dewbyrtha na ka bynta ka M/s Goldstone Cements Limited lyngba ka shithi no. MG. 72/2022/242 tarik 28th September, 2022. Ka jaka ba la mang ka don ha Shnong Umtyra, Chiehruphi, Sub Post Office Chiehruphi, P.S. Lumshnong, District: East Jaintia Hills, Meghalaya. Ka jinglah ban pynmih ne ka jingdon u mawshun @ 3,58,369 TPA (max), bad ka jingpynmih ia u dewbyrta @ 1,21,909 TPA (max), OB kum u syiapmaw @ 67,622 TPA (max) & kum u syiapkhyndew @47279 TPA (max) bad ka jing lah ban pynmih ia u mawshun ka long haduh 45,54,065 Tonnes bad ia u dewbyrta 3,96253 Tonnes. Ka rukom tih ia u mar kan long da kaba shu khlong ia ka khyndew da ki kor ki bor bad sa kaba shu ksam shapoh.

11.0.1 KYRTENG JONG KA JAKA.

Ka Projek ba la mang "Umtyra Limestone and Clay Deposit" ka don ha Umtyra, Village: Chiehruphi, Sub Post Office Chiehruphie, P.S. Lumshnong, District: East Jaintia Hills (Meghalaya).

11.0.2 KI MAT JONG KANE KA PROJEK.

S. No.	Particulars	Details
1.	Kyrteng jong ka Projek	Umtyra Limestone and Clay Deposit
2.	Jaka	Umtyra, Village: Chiehruphi, Sub Post Office Chiehruphie, P.S. Lumshnong, District: East Jaintia Hills (Meghalaya)
3.	Jingheh jongka jaka na ka bynta kata ka projeck	6.7892 Ha.
4.	Jait Jaka	Jaka la jong.

5.	Latitude & Longitude	25°12'0.02"N to 25°12'12.46"N and 92°21'21.39"E to 92°21'35.72" E
6.	Ka jingpeit na ka liang ka jing khynnuih u Jumai	Zone – V

11.1 KA JINGBATAI IA KA PROJEK.

Ka Mining and Geology Department, Government of Meghalaya ka la ai bor ia kattei ka jaka ba don ka jingheh kumba 6.7892 hectare na ka bynta ban tih ia u mawshun bad u dewbyrtha na ka bynta ka M/s Goldstone Cements Limited lyngba ka shithi no. MG. 72/2022/242 tarik 28th September, 2022. . Ka jaka ba la mang ka don ha Shnong Umtyra, Chiehruphi, Sub Post Office Chiehruphi, P.S. Lumshnong, District: East Jaintia Hills, Meghalaya. Ka jinglah ban pynmih ne ka jingdon u mawshun @ 3,58,369 TPA (max), bad ka jingpynmih ia u dewbyrta @ 1,21,909 TPA (max), OB kum u syiapmaw @ 67,622 TPA (max) & kum u syiapkhyndew @47279 TPA (max) bad ka jing lah ban pynmih ia u mawshun ka long haduh 45,54,065 Tonnes bad ia u dewbyrta 3,96253 Tonnes. Ka rukom tih ia u mar kan long da kaba shu khlong ia ka khyndew da ki kor ki bor bad sa kaba shu ksam shapoh.

GEOLOGY

11.1.1.1 Local Geology

Ka jaka ba la mang lah iohi ba ka tap da ka khyndew bad ka dewbyta. Ka jingiohi ia ki maw u paw sha NNE- SSW/SW ki bynta jongka jaka ba la mang. Ka jingmih u maw ha ki bynta ba la mang ka long kum ha ka Shella Limestone Formation under Jaintia Group. Ha Umtyra (6.7892 Ha.) ha ka jingheh, ki jinglong ki maw ki kynthup mawshyiap bad mawshun ha ryngkat mawshlite. Kan don ka jingkhleh lang jong clastic bad non-clasticfacies ha ka jingshna ia ka stratigraphic sequence. Ka jinglong khohruh khohram ka rukom shong ka long sha N-S, NNW-SSE to NW-SE ba jylliew (3º to 10º) ba noh sha mihngi.

Table 11.1: local stratigraphic succession in the prospective as follows:

A	Sandy Soil/ Alluvium with loose weathered sandstone and sandstone boulders. Avg. thickness 1.50 m
B	Sandy Clay/Clayey weathered material with loose fragile sandstone in most of the time it is recovered as sludge. Avg. thickness 4.07 m
C	Umlatadoh Member: It comprises 4 lithounits. Maximum & minimum thickness encountered in borehole is 37.18 m & 18.35 m respectively and Avg. thickness is 26.16 m
	Upper Sandstone (SST04)

	Upper Limestone (LST03) Upper middle Sandstone (SST03) occasionally calcareous with thin interbands of grey to dark greyish shale, siltstone.
	Middle Limestone (LST02)
D	Lakadong Sandstone Member: Avg. thickness is 18.17 m
	Lower middle Sandstone (SST02) interbedded with shale and shaly coal seams
E	Lakadong Limestone Member: Encountered thickness is 46.80-53.86 m
	Lower Limestone (LST01) with thin interbands of greyish calcareous sandstone
F	Therria Sandstone Member: Encountered thickness is 14.95 m still continuing.
	Lower Sandstone (SST01)
Basement not seen	

11.1.1.2 Physiography

Ka topography jong ka jaka ba la kdew ka long khohruh khohram ba ym long madan don ba long lum don ba long madan, Haka jingjrong ba jrongtam ka long 771 mRL bad haka jingjylliew ba shapoh 745 MSL. Ka nala ba don ha ka jaka ba ka kdew ka long shathie lam shatei.

11.1.2 GEOLOGICAL AND MINEABLE RESERVES

Limestone							
Classification	**Code**	**Quantity**			**Grade**		
A. Mineral Reserve		**Forest**	**Non-Forest**	**Total**	**Forest**	**Non-Forest**	
		--	Limestone	Limestone	**--**	--	
1. Proved Mineral Reserve (A)	111	0	--	-	**--**	--	
2. Probable Mineral Reserve (A)	121	0	4554065	4554065	**--**	CaO	48.91
						MgO	1.37
						SiO2	2.85
3. Probable Mineral Reserve (A)	122	0	--	--	**--**	**--**	
B. Remaining Resources		0	--	--	--	**---**	
1. Feasibility Mineral Resource (B)	211	0	--	--	**---**	--	
2. Prefeasibility Mineral						CaO	48.89

Resource (B)	221	0	3962619.76	3962619.76	--	MgO	1.39
						SiO2	3.09
3. Prefeasibility Mineral Resource (B)	222	0	---		---	--	
4. Measured Mineral Resource (B)	331	0	---	- - -	---	--	
5. Indicated Mineral Resource (B)	332	0	---	- - -	---	--	
6. Inferred Mineral Resource (B)	333	0	---	- - -	---	--	
7. Reconnaissance Mineral Resource (B)	334	0	---	- - -	---	--	
Total Mineral Resources (A+B) (121 + 221)	0	**8516685.08**	**8516685.08**	---	- -		

Clay							
Classification	**Code**	**Quantity**			**Grade**		
A. Mineral Reserve		**Forest**	**Non-Forest**	**Total**	**Forest**	**Non-Forest**	
		0	Clay	Clay	---	--	
1. Proved Mineral Reserve (A)	111	0	--	--	---	--	
2. Probable Mineral Reserve (A)	121	0	396253.36	396253.36	-	SiO2	66.7
						CaO	2.36
						MgO	0.49
3. Probable Mineral Reserve (A)	122	0	--	--	---	--	
B. Remaining Resources		0	--	--	---	--	
1. Feasibility Mineral Resource (B)	211	0	--	--	---	--	
2. Prefeasibility Mineral Resource (B)	221	0	27537.84	27537.84	--	SiO2	66.35
						CaO	2.38
						MgO	0.50
3. Prefeasibility Mineral Resource (B)	222	0	---	---	---	--	
4. Measured Mineral Resource (B)	331	0	---	---	---	--	
5. Indicated Mineral Resource (B)	332	0	---	---	---	--	
6. Inferred Mineral Resource (B)	333	0	---	---	---	--	

7. Reconnaissance Mineral Resource (B)	334	0	---	---	---	--
Total Mineral Resources (A+B) (121 + 221)		0	**423791.2**	**423791.2**		---

11.1.3 KA JINGBATAI IA KA RUKOM TIH:

Ka rukom tih ia u maw kan long da kaba shu khlong ia ka khyndew da ki kor ki bor bad sa kaba shu ksam shapoh bad pynpait ia u maw. Ka jingpyntreikam kan long kat kum ka Mining Plan ba la ioh jingbit bad PMCP ka dei:-

- Ka rukom tih ia u maw kan long da kaba shu khlong ia ka khyndew da ki kor ki bor bad sa kaba shu ksam shapoh.
- Ka mied jingjrong yn buh 6 m bad jingiar jong ka mied kam dei ban duna ia ka mied jingjrong.
- Ka jingksam shapoh ia ki thliew ban pynbthei ia ki maw ka long ha ka jing heh ba 3.5 m bad ka jingkhiah ba 2.75 m ha ka jingjylliew ba 6m bad ka jingksam ka shong ha ka jinglong bad jingman ki miej. Nitrate Mixture and Emulsion cast boosters lah pynkreh ban pyndonkam ha ka rukom pynbthei, Non-electric Initiation (NONEL) la pynkhreh ban pyndonkan khnang ban pynduna ia ka jingkynniuh ka madan.
- Ka jingksam ia ka thliew kan long (115 mm dia holes) bad ban pyndonkam da ka DTH drill.
- Ka slope mied kan long beit 45°.
- Ia u mawshun ba la pynpait lah ban pynkit sha ka 250 TPH crusher haka cement plant (ha ka kyrteng jong ka M/s Goldstone Cements Ltd.).
- U mawshun ba pynmih na Umtyra Limestone and Clay Deposit dei ban pyndonkam kam u clinker manufacturing plant jong ka GSCL (Goldstone Cements Ltd.).
- Ka jingrah ne jingkit kan long beit na jaka pynmih ne ka stock.

11.1.4 KA JINGTIP JONGKA JINGMIH.

Ka jingpynmih ia u maw hapoh san snem kan long katkum ba la kdew harum:-

Table 11.2: Production Details

Year	Limestone ROM (Tonnes)	Production associated (Clay) (Tonnes) A	OB (Tonnes) B		Waste (Tonnes) {A+B}
			As sandy soil	As Sandstone	
1st	203189.61	121908.59	47279.1592	67622.1428	114901.32
2nd	345709.82	49144.73	26230.507	15492.66295	41723.15

3rd	358369.01	81000.78	17682.7756	18625.9669	36308.74
4th	314387.59	9931.91	5761.4308	680.2903	6441.72
5th	323284.06	16816.14	6865.612	16468.7411	23334.35
Total	**1544940.09**	**278802.15**	**103819.4846**	**118889.8041**	**222709.29**
Note: The maximum quantity (tonnes per annum) for the proposed production capacity has been taken from the proposed year wise development plan.					

11.1.5 KA RUKOM PYNDONKAM IA KA JAKA:

Ka jingpyndonkam ia ka jaka ba la kdew na ka bynta ban tih ia u marpoh khyndew ka kynthup ia ka jingkhlong ia ka khyndew ba tap najrong, nangta pynpait ia u maw ba la paw hajrong hadien ba la dep pynkhuid ia ka khyndew bad kan long kum ba la kdew harum:-

Table 11.3: Land Use Pattern

S. No.	Land Use Category	Pre-Operational (Ha.)	Operational (Ha.)	Post-Operational (Ha.)
1	Top Soil Dump	--	--	--
2	Overburden Dump	--	1.100	1.100
3	Pit & Quarry Area	--	4.000	4.000
4	Road	--	0.220	0.220
5	Infrastructure	--	--	--
6	Afforestation	--	0.960	0.960
7	Mineral Storage	--	--	--
8	Waste/Sub – grade stack yard	--	--	--
9	Area Under utility services	--	0.50	0.50
10	Undisturbed Area	6.7892	0.0092	0.0092
Total		**6.7892**	**6.7892**	**6.7892**

11.2 KA JINGLONG KA MARIANG:

Ban peit bha ia ka mariang kum ka meterorology, ka lyer, ka um, ka khyndew bad ka jinglong jong ka jingsawa, ki jaka peit bniah la buh ha ki hynriew jaka ha ka jaka ban pule/peit thuh. Ia ka baseline data la shim ha ka por tlang (Nohprah' 2022 haduh Rymphang' 2023). Ia ka jingbatai bniah ha kine ki jaka la ai harum:-

Table 11.4: Sampling Location

Sr. no.	Sampling Location	Distance (Km)	Direction	Components
1	Mine site	--	--	Air, Water, Noise, Soil
2	Khliehriat Lumshnong	1.8	ENE	Air, Water, Noise, Soil
3	Thangskai	1.9	ESE	Air, Water, Noise, Soil
4	Lumshnong	3.1	SW	Air, Water, Noise, Soil
5	Umlong	4.0	SW	Air, Water, Noise, Soil
6	$25^0$11'45.96" N $92^0$20'45.32" E	1.3	SW	Air, Water, Noise, Soil
7	Near to Black tiger Cement	0.8	NW	Air, Water, Noise, Soil
8	$25^0$13'15.68" N $92^0$21'10.69" E	0.2	NW	Air, Water, Noise, Soil

11.2.1 KA JINGLONG JINGMAN KA JAKA:

11.2.1.1 Ka jinglong ka jaka:

Ki symboh khyndew la shim na ki phra jaka bad ha ka jingpait bha ia ka jingshong ka khyndew ka long harum:

Table 1.5: Soil Analysis

pH	:	6.56 to 7.65
Soil Conductivity	:	276.21 to 427 µmhos/cm
Total Nitrogen (N)	:	149 kg/ha. to 310 kg/ha.
Phosphorus as P	:	42.44 kg/ha to 58 kg/ha.
Potassium as K	:	174-270 (kg/ha.)

11.2.2 Ka Jinglong Jingman jong ka Um:

Ki um na ki Phra tylli ki jaka ban pule la shim. Ka jingiohi ia ka jingtohkit la pyni harum:-

Table 11.6: Water Quality Status

S.No.	Parameter	Units	Requirement (Desirable Limits)	Permissible Limits in the Absence of Alternate Source	Mine Site	Khliehriat Lumshnong	Thangskai	Lumshnong	Umlong	$25^0$11' 45.96" N $92^0$20' 49.32" E	Near to Black Tiger Cement	$25^0$13'15.68 " N $92^0$21'10.69 " E
Organoleptic & Physical Parameters												
1.	Colour	Hazen Unit	5	15	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2.	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3.	Taste	-	Agreeable	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4.	Turbidity	NTU	1	5	<1.0	<1.0	<1	<1	<1.0	<1.0	<1	<1
5.	pH value	-	6.5-8.5	-	7.48	7.18	6.93	7.22	7.54	7.16	7.35	6.98
6	Total Dissolve Solid (TDS)	mg/l	500	2000	325.0	380.0	260.0	319.0	389.2	321.0	402.0	241.9
General Properties												
7	Aluminum (as Al)	mg/l	0.03	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8	Total Ammonia	mg/l	0.5	No Relaxation	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
9	Anionic surface Detergents(as MBAS)	mg/l	0.2	1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
10	Barium (as Ba)	mg/l	0.7	No Relaxation	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
11	Boron (as B)	mg/l	0.5	2.4	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
12	Calcium(as Ca)	mg/l	75	200	65.27	56.82	52.39	58.20	56.95	56.95	54.32	61.47
13	Chloramines (as Cl2)	mg/l	4.0	No Relaxation	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
14	Chloride (as Cl)	mg/l	250	1000	16.26	14.39	13.82	16.84	15.73	14.62	14.69	13.95
15	Copper (as Cu)	mg/l	0.05	1.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
16	Fluoride(as F)	mg/l	1.0	1.5	0.29	0.30	0.28	0.33	0.38	0.31	0.28	0.32
17	Free Residual Chlorine	mg/l	0.2	1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
18	Iron (as Fe)	mg/l	1.0	No Relaxation	0.128	0.121	0.120	0.129	0.129	0.124	0.132	0.129
19	Magnesium (as mg)	mg/l	30	100	3.92	4.06	3.65	4.08	3.84	3.79	4.10	4.18
20	Manganese (as Mn)	mg/l	0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
21	Mineral Oil	mg/l	0.5	No Relaxation	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

22	Nitrate (as NO_3)	mg/l	45	No Relaxation	0.33	0.31	0.30	0.32	0.32	0.31	0.30	0.32
23	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Silver (as Ag)	mg/l	0.1	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
25	Sulphate (as SO_4)	mg/l	200	400	25.81	23.92	22.87	28.14	26.75	24.65	26.82	26.83
26	Sulphide(as H_2S)	mg/l	0.05	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
27	Alkalinity(as Ca CO_3)	mg/l	200	600	162.0	176.0	179.0	196.0	201.0	194.0	187.0	187.0
28	Total Hardness (as $CaCO_3$)	mg/l	200	600	154.0	168.0	161.0	178.0	174.0	167.0	164.0	165.0
29	Zinc (as Zn)	mg/l	5	15	0.132	0.154	0.142	0.161	0.162	0.159	0.151	0.148
Parameters Concerning Toxic Substances												
30	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
31	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
32	Phenol	mg/l	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
33	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
34	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
35	Molybdenum (Mo)	mg/l	0.07	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
36	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
37	Poly nuclear Aromatic	mg/l	0.0001	No Relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
38	Poly chlorinated biphenyl	mg/l	0.0005	No Relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Microbiological Parameter												
39	Escherichia coli	Absent/100ml			Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
40	Coliform Bacteria	Absent/100ml			Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

11.2.3 Ka Jinglong Jingman jong ka Lyer:

Ban peit bha ia ka jinglong jong ka lyer ha ka jaka pule ka systematic ambient air quality monitoring la pyniaid ia ki jait jingjaboh (PM10, PM2.5, NOX, SO2 and CO) ha ki hynniew jaka ba don ki ambient air quality monitoring stations.

11.2.3.1 Jinglong ka Lyer:

Ka Ambient air quality monitoring la pyniaid shakhmat ha ka por ar sien shi taiew ha ki phra jaka ha kawei ka aiom kata naduh Nohprah' 2022 haduh Rymphang' 2023. Ka jingiohi ia ka jinglong jong ha baroh ki jaka ki long kumne harum. Ia kine la pyniahap kat kum ka jingbuh da ka Central Pollution Control Board (CPCB) jong ka rural bad residential zone.

Table 11.7: Ambient Air Quality Status

S. No.	Sampling Location		Parameters				
			PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x (As NO_2) ($\mu g/m^3$)	CO (mg/m^3)
1.	Mine Site	Min	28.70	18.65	3.94	6.31	0.18
		Max	66.30	29.44	14.23	18.55	0.70
		Avg.	57.10	23.18	9.45	13.83	0.55
		98th% ile	66.16	29.35	14.22	18.13	0.68
2.	Khliehriat Lumshnong	Min	28.44	17.45	11.76	16.85	0.16
		Max	66.80	30.96	14.75	19.5	0.77
		Avg.	45.20	21.77	12.85	17.50	0.41
		98th% ile	66.34	30.34	14.53	19.21	0.72
3.	Thangskai	Min	28.20	17.24	11.55	15.67	0.15
		Max	69.20	31.14	13.88	18.36	0.84
		Avg.	42.79	21.93	12.55	16.78	0.41
		98th% ile	65.57	29.51	13.83	18.31	0.84
4.	Lumshnong	Min	30.52	16.64	9.23	15.62	0.28
		Max	56.30	26.65	18.56	20.31	0.59
		Avg.	46.30	19.94	13.87	18.74	0.43
		98th% ile	55.89	26.64	17.74	20.17	0.59

5.	Umlong	Min	33.45	16.66	6.35	8.25	0.24
		Max	53.47	25.52	9.98	14.65	0.55
		Avg.	41.86	20.68	8.39	11.22	0.37
		98th% ile	52.23	24.91	9.98	14.65	0.53
6.	$25^0$11'45.96" N $92^0$20'49.32" E	Min	30.99	16.76	5.19	8.26	0.24
		Max	59.63	28.65	10.90	17.85	0.68
		Avg.	44.14	20.29	7.34	11.46	0.42
		98th% ile	59.16	27.73	10.89	17.39	0.68
7.	Near to Black Tiger Cement	Min	28.70	18.65	8.14	11.25	0.39
		Max	66.30	29.63	66.30	29.44	0.58
		Avg.	53.42	25.69	23.09	16.09	0.47
		98th% ile	66.16	29.56	65.65	26.60	0.58
8.	$25^0$13'15.68" N $92^0$21'10.69" E	Min	38.14	26.20	7.59	10.52	0.28
		Max	59.24	38.86	12.12	18.21	0.47
		Avg.	44.59	28.62	8.86	11.74	0.37
		98th% ile	56.59	35.03	11.66	15.57	0.44
NAAQ STANDARDS			**100**	**60**	**80**	**80**	**2**

11.2.4 Ka Jinglong Jingman jongka Jingsawa:

Ka jingthew ia ka jingsawa la pyniaid ban tip bha ia ka jinglong ka jingsawa ha ki hynriew jaka ban pule. Ka jingthew ia ka jingsawa ha man ki jaka la shim ha 24 kynta. Ka jingiohi ba la ioh la pyniahap bad ka national standards bad la shem ba long kat kum ka standard. Ki data ba la ioh la pyni harum:-

Table 11.8: Ambient Noise Level Status

Location	Date of Sampling	Day Time (6.00 AM to 10.0PM)	Night Time (10.00 PM to 6.00 AM)
Mine Site	08.12.2022	57.6	43.0
Khliehriat Lumshnong	24.12.2022	51.4	39.8
Thangskai	05.12.2022	50.1	41.2
Lumshnong	04.01.2023	53.5	42.6
Umlong	18.01.2023	54.2	40.4
$25^0$11'45.96" N $92^0$20'49.32"	23.01.2023	56.4	43.1
Near to Black Tiger Cemen	01.02.2023	52.3	37.6

$25^0$13'15.68" N $92^0$21'10.69'	04.02.2023	52.8	38.8
Standards			
Category of Area/ Zone		Day Time	Night Time
Industrial Area		75	70
Commercial Area		65	55
Residential Area		55	45
Silence Zone		50	40

11.2.5 Ka Jingioh Jingkot jong ki Briew:

Ka jaka pule ka kynthup ia 17 tylli ki shnong jong Meghalaya hapoh 10 km ka jaka sawdong na ka mine.

Table 11.9: Demography Profile of the Study Area

S. No.	Particulars		Details
1.	No. of Villages		17
2.	Total Population		11278
	a.	Male	5582
	b.	Female	5696
3.	No. of Households		1913
4.	No. of Literates		4999
	a.	Male	2245
	b.	Female	2754
5.	Main Workers		3001
	a.	Male	1847
	b.	Female	1043
6.	Marginal Workers		1071
	a.	Male	535
	b.	Female	536
7.	Non-workers		6765
	a.	Male	2950
	b.	Female	3815

(Source: Census, 2011)

11.2.6 Ka Jingmih ha ka Mariang:

Buffer Zone
Flora
Climber – 19 Specie

Herb – 40 Species
Shrubs - 70 Species
Tree – 74 Species
Fauna
Amphibian – 17 Species
Fish - 16 Species
Avifauna – 92 Species
Butterflies – 28 Species
Mammals – 27 Species

11.3 KA JINGPYNKREH BAD BAN TEHLAKAM NA KA JINGJOT JONGKA MARIANG (EMP):

Ka jingshim kyllum ia ka jinglum kyllum ia ka jinglong jingman ka mariang katkum ka jingiohi ne ka jingtih ba lah paw kaba lah kdew haruh:-

Impact	Mitigation Measures
Jinglong bad ka jingpynkhreh na ka bynta ka jaka.	
Ka khyndew kan sa julor namar ba tih bad bret ia ki jaboh.	Ka jingkyllum ban tih ia ka jaka ka long 4.00 ha. ia ka ban pynkylla sha ka jaka buh um, kane kan iarap ia ki umpohliew ba don ha sawdong ka jaka. Ka don ka jingthmu ban leh ia ka green belt ban thung dieng ha ka 7.5m jaka ba long shngain na ka bynta jongka 0.961 ha. kumba 2402 tynrai ki dieng. Ka jingiarap ia ka jaka.
Jinglong bad ka jingpynkhreh na ka ban ym pynjaboh ia ka Um.	
Ban pyllait ia ki um jakhlia na ka Jaka Trei. Ka jingiakynduh ka um poh khyndew por pyntreikam ha ka jingtih.	Kan nym don jingpyllait um jakhlia na ka jaka tih. Kat kum ka Mining Plan ba la shim bad ka PMCP, ka jingheh jong ka pit (704 MSL) kan long hajrong ka um khyndew bad kan ym kynduh.
Jinglong bad ka jingpynkhreh na ka ban yn ym pynsniew lyier.	

Pumpum kan her por tih, por rah bad pynhiar. Ki lyer jaboh kin bha naba iaid kali.	➢ Ia ki kali ba iaid ha ka jaka treikam yn shna bad peit bha ban buh ka jingmih lyer hapoh ki adong. ➢ Ha jaka pynhap bad pynkiew bad ki lynti iaid, yn pynbuh um ban pashaid ban pynduna ka jingmih pumpum. ➢ Ha ban pyrthuh ia ka jingkylla ha ka jinglong jong ka lyer, AERMOD version 8.8.0 model la pyndonkam. Ka baheh tam ba pynkiew ia ka jingkhleh khyndew PM_{10} & $PM_{2.5}$, NO_X & CO na ki bapher ki jaka ba tih ha ka por pule (tlang) la iohi ba ka long 0.05576 µg/m^3 & 0.034 µg/m^3, 0.00408 µg/m^3, bad 0.000025 mg/m^3. ➢ Ki jingmih kan iai don hapoh ka National Ambient Air Quality Standards na ki bynta ki kharkhana/ jaka sah briew.
Jinglong bad ka jingpynkhreh na ka bynta jingsawa.	
Jingsawa na ka daw ba leh mining Jingsawa na ka daw ba iaid kali.	➢ Ka jingsawa na baroh ki jaka ka long man ka por bad hatang por treikam ➢ Ka jing pynbthei ia ki maw kan long beit ha ka por mynsngi ban pynduna ia ka jingsawa bad jingkhynniuh da kaba pyndonkam ia ki buit ha kane ka projek ba la mang. ➢ Ka jingthew ia ka jingsawa ba la shim data ha ka jaka ka long hapoh ka adong jong ka National Ambient Noise Quality Standards ➢ Ka jingdon jong ka jingkah ha ba don ka jingthung dieng ne green belt ka jingsawa kan duna ha kane ka jaka ba la kah ki lum ki wah/ba shna kali.
Ka Jingioh Jingkot ne Ka Jingiarap na ka bynta ki Briew	
➢ Jingiohkam ➢ Jingpeit bniah iaka jingkoit jingkhiah ➢ Jaka ai pule	➢ Ka jingtreikam mining kam ktah than ia ka jingioh jingkot ki briew ➢ Kam don jingkynriah (0) ha ka jaka ba la mang ban leh mine. ➢ Kumba 78 ngut ki nongshong shnong kin ioh lad treikam ryngkat bad ka jinghikai man ka por ban pyntbit ki sap bapher. ➢ Ki rukom bathymmai ban aikam/ioh pisa yn sa ioh pynmih. ➢ Ka jingpeit ia ka jingkoit jingkhiah man ka por da ki health camp. ➢ Ka jingiarap skul bad ioh scholarship ia ki khynnah yn ai.

Jingmih ha ka Mariang

➢ Jingktah jong ka jingkylla ha jinglong jingman jong ka mariang ➢ Ki mrad bad ki jingthung ki ban shah ktah.	➢ Ka jingpyntreikam ia ka mining kan don ka jingktah bajur bha ia ki mrad bad jingthung jingtep. Ka jinglong jong ka projek ka long ban iarap ia ki jingthung jingtep ha ka jaka ba la thmu. ➢ Ki jingthung jingtep ba don ha ka jaka mining ki long ki dieng bad sanium. Kin nym shah pynthud na ka daw ka jingpyntreikam mining. Te, ka jingktah ia ki jingthung jingtep kan long kaba duna. ➢ Baroh ki jingdonkam ban peit ia ka jing jaboh yn shim da u nongshimwai ban pynduna ia ka jingktah ia ka mariang ba ker sawdong. ➢ Ka jingkit ia ki jaboh ka lah ban pymih ia ki pum pum kaba lah ban ktah ia ka jinglong jingman ka mariang. ➢ Ki jingheh jong ki jingthung hajan bad shajan ki jaka sah. Ka jingsawa bad khih na ka daw ba pynbthei bad jingtreikam ki machine kin beh ia ki mrad na khlaw bad ki sim na ki skum hajan ➢ Ki jaka ba kyllum bad ki jaka ba pyniakhlad ki long jah na ki jaka mariang ba kloi ban shah ktah. Te ka jingktah ia ka jinglong jingman jong ka mariang bad ki mrad ka long ba duna. ➢ Ia ka Green belt yn pynroi bad u pud u sam u riew shimet ba ai wai ban long kum ka kynroh na ki jaboh ia ka jinglong jingman ka mariang. ➢ Ka la don ruh ka jingiashimti ia ka jingthung jingtep ha ka lynti iaid kali jong u nongshimwai bad ka surok ba ia snoh lang. ➢ Ka jingpynbthei, Jingksam bad Ka jingkit ia u mar kan long ha ka por sngi khnang ka kan yn ym pynwit ia ki jingim ba don sha marjan. ➢ Baroh ki kyndon ba la buh da ka pollution control measure kin hap ia bud.

11.4 KI KYNDON HA JINGPEIT BNIAH NA KA BYNTA KA MARIANG:

11.4.1 KA LYER.

Ka jingpeit ia ka lyer sawdong kan long ha ka kyndon jong ka SPCB and CPCB.

11.4.2 KA UM.

Ka jing peit ia ka rukom long ka um ka long ha man la ka por ha ki jaka bapher bapher, bad ka jingpynlum ia ka um kan long saw sien ha ka snem katta Pyrem, Lyiur, Synrai bad Tlang.

11.4.3 KA JINGSAWA.

Kam jingthew ia ka jingsawa yn shim ha jaka trei bad hajan ka machines ha ka por mynsngi bad ka por mynmiet.

11.4.4 KA JINGPEIT BNIAH IA KA JINGKOIT JINGKHIAH.

Ka jingpeit ia ka jingkoit jingkhiah man ka por da ki health camp. Ki painkana ban shna hajan ki jaka ba biang and ki Jaka ban dih um ban shna na ki bynta kiba trei.

11.5 KIWEI KIWEI DE KI JINGPEITBNIAH

11.5.1 JINGPYNSNGEW PAIDBAH

Ia ka jingpynsngew paidbah kan long katkum ka EIA Notification 14th September, 2006 bad kat kum ka ain.

11.5.2 KA JINGTREIKAM BAD KA JINGTEHLAKAM IA KI JINGMA:

Ka jingpeit ia ka jingma ka dei ka jingpule ba dap da ka jingbamtikna bad mad jingma ha ki katno katne ki jaka. Ban peitngor ia ka jingma ka dei ban ithuh ia ki jingma ba iadei bad ka jingpyntreikam mining, bad ban sgewthuh kumno bad hangno yn shem bad ianujor ia ka jingkynduh (ha ka pisa lane ha kiwei kiwei) ha ka jingmih. Ka pyni bad nujor ia ki jingma ia ki riew shimet, ki kam bad government agencies ba lah ban ioh na ka mariang lane da ki jingjia ki briew.

Tangba kin don hi kato katne ki daw kiba lah ban pynlong kaba ma ha ki por treikam/jingmaham ha ba tih ia u mawshun (major minerals). Ia ki jait jingma la pynithuh por tih mawshun bad la pyni harum:-

1. Ba mynsaw por pynkiew, pyniaid bad bret ia u maw.
2. Ba mynsaw da ka daw bai aid kali
3. Ba rung um

Ban pyniaid bha ia ki kam ki jam, ki jingkdew harum yn bud na ka bynta ban iada na ki mynsaw ha ka mine.

Step 1: Ki jingïit ia ki jingma ba ktah na ka jingpynjot

Step 2: Ki jingïit ia ki briew ba don ha ka jingma

Step 3: Ki jingwengnoh ia ki jingjulor

Step 4: Ka jingtipbniah na ka bynta ka jingma

Step 5: Ki lad ban iada ba iadei ban shim

Step 6: Ban buh jingkhein

Step 7: Ban peit biang.

11.6 PROJECT BENEFITS

Ka jing donkam ia u Mawshun bad u Dewbyrta kala nang kiew ha ka jylla jongngi namar ka jingmih jong ki company bad ka jing donkam jong ki. Ka jingpynmih ia kine ki mar ka long ban pyndap ia ka jingdonkam jong ki ha ka liang u mawshun bad dewbyrta. Ka jing lah ban

pynmih ia u mawshun @ 358369 TPA (max), bad ha ka juh ka por ban pynmih ia dewbyrta (Clay) @ 121909 TPA (max), OB kum u syiapmaw @ 67,622 TPA (max) bad u syiap khyndew @47279 TPA (max) la mang ban pyndap ia ki jingdonkam.

Ka jingdon kane ka projek ka iarap ban pynioh kam ne pynkiew ia ka jingioh jingkot ki briew kiba trei hapoh kane ka project ne ia kiba shabar ruh. Ka jingkiew jongioh jingkot ka kane jaka ha ka liang ka jingpule puthi, jingkoit jingkhiah, ai jinghikai, Ki jingpynsngewthuh, ka iaid ki kali, ki jaka shna kali, karkhana bad ki jingshna ban pynbiang ia ka iaid ka ieng kiba ha rukom. Ka rukom im kan long kaba shngain bad kan long kaba bha, ka jing thung ia ki dieng kan long na ka office jong ka Social Forestry ha shnong, school bad ki jaka ba la pynbeit na ka shnong ne ka jylla na ka bynta ka jingbha ka mariang.

11.7 ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan (EMP) ka don ia ka jingthmu ban pynneh pynsah ia ki jingim ba im bad ruh ia ka mariang da ka bud ia ki kyndon ba la buh na ka bynta ban pyntrei kam ha ka jaka jong kane ka projek. Kan don ka jing peit bniah na ka bynta ka jinglong jingman ka mariang.

11.7.1 LAND USE MANAGEMENT

Ki mat ban pynkhie im biang ia ka jaka kan long kumne harum:

1) Ha kaba kut ka jingdon u maw, ka jingheh jong ka jingtih ia ka jaka kan long 5.804 ha.
2) Lah mang ban leh ia ka Green belt ne ban thung dieng kan long ha ka jingheh ka jaka ba 0.985 ha.

11.7.2 WATER POLLUTION MANAGEMENT

Ki Katto katne ki kyndon ban tehlakam ia ka jingpyn jakhlia ia ka um ki long kumne harum:-

- Hadien ba la dep peit bniah bha, kaei ba dei ban leh hap ban leh.
- Ka jingthew ia ka jingkiew jing hiar ka um bad ban pyndonkam ia ka um ka jing don ka thliew um ne ka jaka buh ia ka um dei ban don.
- Ka jingpeit bniah bad pule bniah ia ka jinglong jing man ka um ha manla ka por.
- Ki jaboh jong ka um kin leit beit sha septic tank bad filter sha thliew.

11.7.3 AIR POLLUTION MANAGEMENT

Ka jingbud ia ki kyndon ban tehlakam ia ka jingsniew ka lyer ki long harum:-

- Ka jingsted jong ki kali hap ban peit bniah bad kin leit beit da kajuh.
- Ka jingpeit bniah ia ka jingpynmih tdem ki kali bad ki kot kali ba biang.
- Ka jing iaid ne jingmih ki kali na jaka trei kin long ba baing khnang ba kan yn ym pynthud ia ka leit ka wan ki nongshong shnong.
- Ki kali ba kit ia ki mar dei ban tap da ki trapal.
- Ban yn ym shah ban kit sha ba palat ban lait na ka jinghap sha surok.
- Ban pynbha ia ka surok.

- Ka jingtista ban pynkhuid ka iarap ia ka lyer ban lait na ki pum pum.
- Ka jing pynsynried um sha ka surok khnang ban lait na ka jingsniew jong u surok.
- Ka shna ia ka jingiada na rud surok ban iada ha ba don pum pum.
- Ia u speed breaker yn shna khnang ban tehlakam ia ka jing pynstet kali. Tangba, ka jingmaham ia ka jingpynstet ia ka kali kan sa don.
- Ka jingtista ba peit bniah bad pule bniah ia ka jinglong jingman ka lyer kan long ha man la ki por. Lada ka jinglong jingman ka lyer ka long palat ia kaba dei ban long, kaei kaba donkam ban leh naka bynta ka jingbha dei ban leh.

11.7.4 NOISE POLLUTION MANAGEMENT

Ki kyndon ban tehlakam ne pynduna ia ka jing mih ka jingsawa ki long harum:-

- Ka jingmih ka jingsawa kan tang ha ki por mynsngi por trei khnang ban lait na ka jingthud ia kiba don shajan.
- Ka jingpeit bniah ia ka rukom long ki kali ki machine kan long ha man la ki por bad ban kylliang ia kiba dei ban kylliang.
- Ka jing pynbha ia ki kali ka long kaba donkam bad yn ym shah ban kit palat pud.
- La maham iaka jingpynsted kali ha kaba iadei bad u surok bad ki surok shnong.
- Ka jingpeit bniah ia ka rukom mih ka jingsawa kan long ha man la ka por khnang ban lait na ka jingpynthud ha ka jingiadei bad ka jingmih jongka jingsawa.
- Personal Protective Equipments i.e., earmuffs and earplugs ban pynbiang ia ki nongtrei khnang ban lait na ka jingsawa kaba khlain.
- Ka jingpeit na ka jingkoit jingkhiah kan long ha man la ka por na ka bynta ki nong trei ban lait na ka jingshah ktah ha ka jingsawa ba mih.
- Ka jingsawa ba mih por trei kan pyni ha ki kor ki bor khnang ban tehlakam ia ka jingkhlain bor ka jingsawa ba mih ha ka por trei.

11.7.5 OCCUPATIONAL HEALTH AND SAFETY

- Ban lait jingma ia ka koit ka khiah ki nongtrei na ki pum pum, jingsawa, bad kiwei kiwei de ki lad jingiada dei ban don ha ka jaka trei.
- Ban tista ban peitbniah ia ki tiar ki machine ba pyntrei katkum ka rukom ba ki lah shna ia ki.
- Ban ai ia ki personal protective equipment ia ki nongtrei ha jingtrei.
- Ban pait bniah ia ka koit ka khiah ki nongtrei ha manla ki por.
- Ka jingia pynsngewthuh ia ki nongtrei ka donkam.

11.7.6 SOCIO-ECONOMIC MANAGEMENT

- Ki Sahep kiba dei peit ia ka mariang ki dei ban peit ia jinglong jingman khnang ba kan ym kthah ia ka mariang.
- Kumba 78 ngut ki trai shnong kin ioh trei beit directly bad kum 5-10 kin ioh indirectly.

- Ka jingioh trei bad ka jinghikai ki bapher bapher khnang ban iarap kam ia ki trai shnong.
- Ka jing ioh trei ki trai shnong ka long ka jingpynshisha. Ia kito kiba lah ioh jinghikai kin thep hadien ba lah pynheh ia ka rukom trei.
- Ka jingpeit bniah ia ka koit ka khiah kan long ha manla ki por.

11.7.7 BIOLOGICAL MANAGEMENT

Ym don jingma ban ktah ne ki jingma ia ki jingim ban mih na ka jaka trei (mining activity). Tangba, ka jingpeit bha bad ka jingthung ia ki dieng kan don khnang ban tehlakam ia ki jingma ia ka mariang bad ki jingim ba don ha ka.

11.8 CONCLUSION

Ia ka jingpule EIA la leh kat kum ka jingmynjur ka ToR. Ka jinglong jingman bapher jong ka mariang la peit thuh kaba iadei bad ka jingtreikam mining. Ka jingiadei bad ki jingktah la ithuh bad peitshai. Da la peit bha ki lad ki lynti ban ianujor ia ka jinglong jong ka mariang ia ka Environmental Management Plan la pynkhreh bad la buh ka pisa ba donkam. Ka EMP ka la long ba iar, ba jem bad pher man la ka por ba rai biang.

Ka projek kan pynkiew ia ka jingioh nong ia ka State Govt. bad kumjuh kan rah ia ka ioh ka kot jong ki briew shnong. Ka programme pynbha ia ka greenbelt kan iarap ban kham jyrngam shuh shuh ia ki jaka ba marjan. Kumta, ka projek ba la don kan ym ktah ia ka mariang lane ia ka jinglong jingman ki jingthung jingtep ba marjan. Ka Senior Management kan shym khia ia ka jingrai ia ka projek jong ka EMP bad ki jingpyntreikam ban pyntikna ba ka EMP ka long ba treikam bha bad biang. Kumta, ki lad ki lynti badei yn shim ban jop ia baroh ki thong ba la buh ha ka EMP bad ka projek kan sa wanrah ka jingktah babha ha ka jaka pule.

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