



ENVIRONMENTAL IMPACT ASSESSMENT
for
The Construction and Operation of a Cement
Factory (5000 tons/day 2 Lines),
at
Mya Leik Taung Area, Near Nat Yay-kan Village,
Kyaukse Township, Mandalay Region
by
Young Investment Group Industry Co., Ltd



(Myanmar Environment Sustainable Conservation)

February, 2024



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ACRONYMS AND ABBREVIATION

ADB	Asian Development Bank
ASEAN	Association of South-East Asian Nations
BAT	Best Available Technologies
BOD	Biochemical Oxygen Demand
CCR	Central Control Room
CEO	Chief Executives Officer
CIA	Cumulative Impact Assessment
CIM	Cumulative Impact Management
CITES	Convention on International Trade in Endangered Species
COD	Chemical Oxygen Demand
CSR	Corporate Social Responsibility
dB(A)	Decibel A- weighting
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management System
ESIA	Environmental and Social Impact Assessment
EU	European Union
GDP	Gross Domestic Products
GHGs	Green House Gases (Glass House Gases)
IFC	International Finance Corporation
ISO	International Standard Organization
IUCN	International Union for Conservation of Nature and Natural Resources
MESC	Myanmar Environment Sustainable Conservation
MIC	Myanmar Investment Commission
MMSP	Managment and Monitoring Sub-Plans

MOECA	Ministry of Environmental Conservation and Forestry
MONREC	Ministry of Natural Resources and Environmental Conservation
MP	Monitoring Plan
MSDS	Materials Safety Data Sheets
NCDC	Naypyitaw Council Development Committee
NCEA	National Commission for Environmental Affairs
NECCCC	National Environmental Conservation and Climate Change Central Committee
NO ₂	Nitrogen Dioxide
OEHD	Occupational Environmental Health Division
OHS	Occupational Health and Safety
OPD	Out Patients Department
PM	Particulate Matter
PM ₁₀	Particulate Matter Smaller than 10 microns
PPE	Personnel Protection Equipment
RPM	Respiratory Particulate Matter
SIA	Social Impact Assessment
SO ₂	Sulphur Dioxide
TPM	Total Particulate Matter
UHT	Ultra High Temperature
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
VSK	Vertical Shaft Kiln
WHO	World Health Organization
YCDC	Yangon City Development Committee

အကျဉ်းချုပ်အစီရင်ခံစာ

ဤအစီရင်ခံစာသည် မန္တလေးတိုင်းဒေသကြီး၊ ကျောက်ဆည်မြို့နယ်၊ မြလိတ်တောင်ဧရိယာ၊ သရက်ပင်ကျေးရွာအုပ်စု Young Investment Group Industry ကုမ္ပဏီလီမိတက် ၏ ဘိလပ်မြေစက်ရုံ (၁ ရက်လျှင် ၅၀၀၀ တန် ထွက်ရှိသည့် ၂ လိုင်း)၏ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာ ဖြစ်ပါသည်။

Young Investment Group Industry Co., Ltd သည် ၂၀၁၁ ဇန်နဝါရီလတွင် ပုဂ္ဂိုလ် ကုမ္ပဏီတစ်ခုဖြစ်ပြီး ၁-၇-၂၀၁၃ တွင် သက်တမ်းတိုးထားပါသည်။ (စာအမှတ် ၂၀၂၁/၂၀၁၀-၂၀၁၁၊ ရက်စွဲ။ ၁-၇-၂၀၁၃)။ ကုမ္ပဏီ မှတ်ပုံတင်အမှတ်မှာ ၁၀၉၀၀၅၅၇၄ ဖြစ်ပါသည်။ (ရက်စွဲ။ ၁၃-၁-၂၀၁၁)။ ကုမ္ပဏီသည် မြန်မာ့ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင် (MIC) မှ ခွင့်ပြုချက်ရရှိပြီးဖြစ်ပါသည်။ (စာအမှတ်- ၈၁၇/၂၀၁၁၊ ရက်စွဲ ၈-၁၁-၂၀၁၁) (ပြင်ဆင်ချက် ခွင့်ပြုမိန့် ၂၉-၁၁-၂၀၁၉)

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အဆိုပါ နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်းအစီရင်ခံစာကို ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဦးစီးဌာနမှ အတည်ပြုခဲ့ပြီးဖြစ်ပါသည်။ (စာအမှတ်-EIA-၁/၈/အတည်ပြု (SR) ၂၀၂၂၊ ရက်စွဲ။ ၁၁-၁၀-၂၀၂၂)

ဤအရာသည် နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်းအစီရင်ခံစာ အတည်ပြုပြီးနောက် နောက်လာမည့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (EIA) လေ့လာခြင်းဖြစ်သည်။ အထက်မှာ ရှင်းပြသကဲ့သို့ ကုမ္ပဏီသည် ရှယ်ယာများဖြင့် ၂၀၁၁ခုနှစ်၊ ဇန်နဝါရီလတွင် တရားဝင်တည်ထောင်ထား၍ ၁-၇-၂၀၁၃ တွင် သက်တမ်းတိုးထားပါသည်။

စီမံကိန်းအဆိုပြုတင်ပြသူအကြောင်း

- စီမံကိန်းအဆိုပြုတင်ပြသူအမည် : Young Investment Group Industry ကုမ္ပဏီလီမိတက်
- လိပ်စာ : အမှတ် ၈၈၆/၈၈၈၊ ၉ မိုင်၊ ပြည်လမ်း၊ ၅ ရပ်ကွက်၊ မရမ်းကုန်းမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး
- ဆက်သွယ်ရန်လူပုဂ္ဂိုလ် : ဒေါ်လှမြတ်သူ

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 စဉ့်ကိုင်မြို့နယ်၊ မန္တလေးတိုင်းဒေသကြီး

အုပ်ချုပ်မှုဒါရိုက်တာမှာ ဦးသီဟအောင် ဒါရိုက်တာ (၃) ဦးမှာ ၊ ဒေါ်နန်းစောထွေး၊ ဒေါ်ခင်မြင့်နှင့် ဒေါ်လှမြတ်သူ တို့ဖြစ်သည်။

ကုမ္ပဏီသည် ၁၀၀ ရာခိုင်နှုန်း နိုင်ငံသားပိုင်ဖြစ်သည်။

အုပ်ချုပ်မှုဆိုင်ရာပုဂ္ဂိုလ်များ

အမည်	နိုင်ငံသား/နိုင်ငံသားမှတ်ပုံတင်အမှတ်	ရာထူး
ဦးသီဟအောင်	မြန်မာ ၁၃/လရန (နိုင်)၀၈၃၄၈၃	အုပ်ချုပ်မှုဒါရိုက်တာ
ဒေါ်နန်းစောထွေး	မြန်မာ ၁/မကတ(နိုင်)၀၄၉၄၉၀	ဒါရိုက်တာ
ဒေါ်ခင်မြင့်	မြန်မာ ၁၃/လရန (နိုင်)၀၉၃၄၀၉	ဒါရိုက်တာ
ဒေါ်လှမြတ်သူ	မြန်မာ ၁၂/ပဟန (နိုင်)၀၈၁၆၅၅	ဒါရိုက်တာ

အတိုင်ပင်ခံအဖွဲ့အစည်းအကြောင်း

မြန်မာ့ပတ်ဝန်းကျင် ရေရှည်တည်တံ့ရန်ထိန်းသိမ်းရေး ကုမ္ပဏီလီမိတက် (MESC)သည် အမျိုးသား စီမံကိန်းနှင့် စီးပွားရေးဖွံ့ဖြိုး တိုးတက်မှုဝန်ကြီးဌာနတွင် (စာအမှတ်။ ရက-စ(၀)၀၀၁/၂၀၁၄ (၀၀၄၇၂၀)၊ ရက်စွဲ။ ၆-၆-၂၀၁၄၊ မှတ်ပုံတင်လက်မှတ်အမှတ် ၈၃၀/၂၀၁၄-၂၀၁၅ (၂၀-၅-၂၀၁၄)ဖြင့် ၂၀၁၄ ခုနှစ်၌ တရားဝင်မှတ်ပုံတင်ထားသော အတိုင်ပင်ခံအဖွဲ့အစည်းတစ်ခု ဖြစ်သည်။ ကုမ္ပဏီမှတ်ပုံတင်အမှတ်အသစ် မှာ ၁၁၀၆၄၉၁၉၃ ဖြစ်သည်။

အတိုင်ပင်ခံအဖွဲ့အစည်း မြန်မာ့ပတ်ဝန်းကျင် ရေရှည်တည်တံ့ရန် ထိန်းသိမ်းရေးကုမ္ပဏီလီမိတက် (MESOC)၏ ကြားကာလ အကြံပေးလိုင်စင်အမှတ်သည် ၀၀၀၃ ဖြစ်သည်။ (ရက်စွဲ။ ၁-၇-၂၀၁၇၊ ECD)

ဆက်သွယ်ရန်လိပ်စာ : အခန်း(၅-ခ)၊ တိုက်အမှတ်(၆၇/၆၉)၊ ပါရမီလမ်း၊ (၁၆)ရပ် ကွက်၊ လှိုင်မြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး

ဆက်သွယ်ရန် ပုဂ္ဂိုလ် : ဦးမြင့်ကျော်သူရ

ဆက်သွယ်ရန်ဖုန်းနံပါတ် : + ၉၅ ၉ ၄၂၀၁၀၅၀၇၁
+ ၉၅ ၉ ၇၃၀၄၄၉၀၃

အီးမေးလ်လိပ်စာ : myanmar.esc@gmail.com

Facebook website : [www.myanmar environment sustainable conservation.com](http://www.myanmarenvironmentconservation.com)

ဤ IEE/EIA စီမံကိန်းတွင်ပါဝင်သော MESOC ၏ အဖွဲ့ဝင်များ IEE/EIA appraisers, သို့မဟုတ် IEE/EIA practitioner မှာ အောက်ပါအတိုင်း ဖြစ်သည်-

အမည်	နိုင်ငံသားနှင့် နိုင်ငံသား မှတ်ပုံတင် အမှတ်	ECD မှတ်ပုံတင် အမှတ်	ကျွမ်းကျင်ဘာသာရပ်
ဦးမြင့်ကျော်သူရ M.Sc (သတ္တဗေဒ)	မြန်မာ ၁၂/ ဒဂတ(နိုင်) ၀၂၈၃၄၉	၀၀၀၆	ဂေဟစနစ်နှင့်ဇီဝမျိုးစုံမျိုးကွဲ လူမှုရေးဆိုင်ရာ သရုပ်ခွဲဆန်းစစ်ခြင်းနှင့် လေ့လာခြင်း၊ အထွေထွေ ပတ်ဝန်းကျင် စီမံခန့်ခွဲခြင်း
ဦးစောဟန်ရှိန် B.Sc (ရုက္ခဗေဒ) M.Sc(အဏ္ဏဝါဇီဝ ဗေဒ)	မြန်မာ ၁၀/ မလမ(နိုင်) ၀၀၈၁၇၃	၀၀၀၇	ဂေဟစနစ်နှင့်ဇီဝမျိုးစုံမျိုးကွဲ၊ ဘေးအန္တရာယ်ရှိမှု ဆန်းစစ်ခြင်းနှင့် ဘေးအန္တရာယ် စီမံခန့်ခွဲခြင်း၊ ရေထု ညစ်ညမ်းမှုကြိုတင်ကာကွယ်ခြင်း၊ ထိန်းချုပ်ခြင်း၊ စောင့်ကြပ်ကြည့်ရှုခြင်းနှင့် ထိခိုက်မှုကြိုတင်ခန့်မှန်းခြင်း
ဦးတင်ထွန်းအောင် B.Sc (Engineering)	မြန်မာ ၁၂/ ဥတမ(နိုင်) ၁၇၂၁၁၁	၀၀၀၉	လေထုညစ်ညမ်းမှုစောင့်ကြပ်ကြည့်ရှုခြင်း၊

ဦးသန်းစိုးဦး M.Sc (သစ်တော)	မြန်မာ ၉/ မနမ (နိုင်) ၀၅၀၈၀၈	၀၀၀၁၁	မြေအသုံးချမှု၊ သဘာဝသယံဇာတစီမံအုပ်ချုပ်ခြင်း (သစ်တော)
ဦးဥက္ကာကျော်သူ (ဘူမိဗေဒ) B.Sc	မြန်မာ ၇/ ရတရ (နိုင်) ၀၉၀၃၇၁	၀၀၀၁၂	ဘူမိဗေဒဆိုင်ရာဆန်းစစ်လေ့လာခြင်း၊ မြေဆီလွှာထိန်းသိမ်းခြင်း
ဒေါ်သင်းသင်းရီ B.Sc (ဓာတုဗေဒ)	မြန်မာ ၁၂/ သယက(နိုင်) ၀၃၉၂၉၂	၀၀၀၁၃	လေထုညစ်ညမ်းမှုကြိုတင်ကာကွယ်ခြင်းနှင့် ထိန်းချုပ်ခြင်း
ဦးသူရကို B.A (History)	မြန်မာ ၁၂/ကမန (နိုင်) ၁၂၄၈၂၄	၀၀၂၇၇	လူမှုရေးဆိုင်ရာ သရုပ်ခွဲဆန်းစစ်ခြင်းနှင့် လေ့လာခြင်း၊ ရှေးဟောင်းသုတေသနနှင့် ယဉ်ကျေးမှုအမွေအနှစ်၊ ဆူညံသံနှင့် တုန်ခါမှု
ဒေါ်ခင်သီတာလဝန်း B.Sc (Mathematics)	မြန်မာ ၁၂/စခန (နိုင်) ၀၆၉၈၇၉	အချိန်ပိုင်း	မိုးလေဝသနှင့် လေအရည်အသွေး ဆန်းစစ်ခြင်းနှင့် ကြိုတင် ခန့်မှန်းခြင်း၊ ဇလဗေဒ၊ မြေပေါ်ရေနှင့် မြေအောက်ရေ ထိန်းသိမ်းခြင်း၊ စွန့်ပစ်အစိုင်အခဲနှင့် ဘေးအန္တရာယ် စီမံခန့်ခွဲခြင်း

MESC တွင် အချိန်ပိုင်း ဝန်ထမ်းများလည်း ရှိပါသည်။

ဤအတိုင်ပင်ခံအဖွဲ့အစည်းနှင့်အတူ ရုက္ခဗေဒပညာရှင်များ၊ သတ္တဗေဒပညာရှင်များ၊ ငှက်ပညာရှင်များ၊ ဂေဟဗေဒဆိုင်ရာ ပညာရှင်များ၊ ရေနေဂေဟဗေဒဆိုင်ရာ ပညာရှင်များ၊ လူမှုရေးဆိုင်ရာ ပညာရှင်များ၊ အင်ဂျင်နီယာများနှင့် ဘူမိဗေဒပညာရှင်များ ပါဝင်လုပ်ကိုင် ကြသည်။

ပတ်ဝန်းကျင်ဆိုင်ရာမူဝါဒနှင့် တရားရေးရာမူဘောင်

Young Investment Group Industry ကုမ္ပဏီလီမိတက်၏ ပတ်ဝန်းကျင်ဆိုင်ရာမူဘောင်သည် တက်နိုင်သမျှ ပတ်ဝန်းကျင်နှင့် လိုက်လျောညီထွေဖြစ်စေသော ဘိလပ်မြေထုတ်လုပ်ခြင်း စီးပွားရေးကို လုပ်ဆောင်ရန်ဖြစ်သည်။ ဘိလပ်မြေထုတ်လုပ်စဉ်တွင် ပတ်ဝန်းကျင်ကို တက်နိုင်သမျှ ကာကွယ် ထိန်းသိမ်းရန် ဖြစ်သည်။

ကုမ္ပဏီသည် အောက်ပါအချက်များကို ကြိုးစားလုပ်ဆောင်ရန်-

- စီမံကိန်းကို ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာကိစ္စရပ်များဖြင့် ကိုက်ညီအောင်ဆောင်ရွက် ရမည်နှင့် ဥပဒေများ၊ စည်းမျဉ်းများကို လိုက်နာခြင်း
- ပတ်ဝန်းကျင်ဧရိယာများအား ညစ်ညမ်းမှုကို တားဆီးရမည်။ ပတ်ဝန်းကျင်ကာကွယ်ခြင်း အတွက် သင့်တော်သောနည်းလမ်းများဖြင့် စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းနှင့် ရွေးချယ်ခြင်း များ ပြုလုပ်ပါမည်။
- ရေ၊ မြေ၊ လေ၊ ဆူညံသံနှင့် ဖုန်၊ စွန့်ပစ်ပစ္စည်းများ ညစ်ညမ်းမှုကို ဖြေလျော့နိုင်ရန် အကျိုးသက်ရောက်သော EIA/EMP ကို ဆောင်ရွက်ပါမည်။
- သဘာဝသယံဇာတနှင့် စွမ်းအင်ကို တတ်နိုင်သလောက် ထိန်းသိမ်းပါမည်။
- အလုပ်သမားများနှင့် ဒေသအဖွဲ့အစည်းများကို ပညာပေးခြင်းနှင့် သင်တန်းပေးခြင်းများဖြင့် ပတ်ဝန်းကျင်ဆိုင်ရာ အသိပညာပေးလုပ်ဆောင်ပါမည်။

ကုမ္ပဏီသည် ပတ်ဝန်းကျင်ဆိုင်ရာနှင့် လူမှုရေးရာဖြင့် လိုက်လျောညီထွေစေရန်အတွက် စံချိန်စံညွှန်းများကို လိုက်နာရမည်။ CSR လုပ်ငန်းများ လုပ်ဆောင်နေပြီး ထပ်မံဆက်လက်လုပ်ဆောင် သွားပါမည်။

ကုမ္ပဏီသည် ဤစီမံကိန်းအတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP)နှင့် စောင့်ကြပ် ကြည့်ရှုလေ့လာခြင်းအစီအစဉ် (MP)ကို လုပ်ဆောင်မည်။ အကျိုးသက်ရောက်သော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ် (EMP)နှင့် စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းအစီအစဉ် (MP)ကို လုပ်ဆောင်ရန်အတွက် EMP အဖွဲ့ငယ်လေးတစ်ခု ဖွဲ့စည်းမည်။ စက်ရုံ၏ မန်နေဂျာသည် EMP အဖွဲ့ခေါင်းဆောင်၊ အခြားဝန်ထမ်း များသည် EMP အဖွဲ့ဝင်များ ဖြစ်သည်။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) ဆောင်ရွက်ခြင်းအတွက် အဖွဲ့ဝင်များ ထပ်တိုးနိုင်သည်။

စီမံကိန်းအကြောင်းအရာအကျဉ်းချုပ်

အဆိုပြုတင်ပြသော ဘိလပ်မြေစက်ရုံသည် တစ်ရက်လျှင် ၅၀၀၀ တန် ထွက်ရှိသည့် ၂ လိုင်း ဖြစ်၍ နတ်ရေကန်ကျေးရွာအနီး၊ သရက်ပင်ကျေးရွာအုပ်စု၊ ကျောက်ဆည်မြို့နယ်၊ မန္တလေးတိုင်းဒေသကြီးတွင် တည်ရှိပါသည်။ ကိုဩဒိနိတ် တည်နေရာမှာ မြောက်လတ္တီတွဒ် ၂၁ ဒီဂရီ ၄၅ မိနစ် ၁၈.၅၇ စက္ကန့်နှင့် အရှေ့လောင်ဂျီတွဒ် ၉၆ ဒီဂရီ ၁၆ မိနစ် ၂၆.၀၇ စက္ကန့်နှင့် ပင်လယ်ရေမျက်နှာပြင်ထက်အမြင့်ပေ ၂၃၉ မီတာတွင် ရှိပါသည်။

အဆိုပြုစီမံကိန်းသည် ၅၁၃.၁၆ ဧကရှိ၍ နတ်ရေကန်ကျေးရွာ၏ အရှေ့ဘက် ၁.၈ မိုင်အကွာတွင် တည်ရှိပါသည်။

စီမံကိန်းနေရာ၏အလယ်ဗဟိုမှ ၂.၅ မိုင်အကွာ အရှေ့ဘက်တွင် မြစ်ငယ်မြစ်ရှိ၍ အဆိုပါမြစ်သည် အရှေ့တောင်ဘက်မှ အနောက်မြောက်ဘက်သို့ စီးဆင်းနေပါသည်။ စီမံကိန်း နေရာ၏ မြောက်ဘက် အစွန်းသည် မြစ်ငယ်မြစ် နှင့် နီးပါသည်။ ထုံးကျောက်ထုတ်ယူမည့် မြလိပ်တောင်သည် အနောက်မြောက်ဘက် ၁.၂၅ မိုင် ခန့် ဖြစ်ပါသည်။ ကန်တွင်း ကျေးရွာသည် အနောက်မြောက်ဘက် ၃ မိုင် ခန့် ဖြစ်ပါသည်။

စီမံကိန်းနေရာသည် နိမ့်သော တောင်တန်းများနှင့် တောင်ကုန်းများ ရှိသော ပြန့်ပြူးသော မြေပြင်အနေအထား တွင် ရှိပါသည်။

အဆိုပြုတင်ပြထားသော ဘိလပ်မြေစက်ရုံအတွက် ရင်းနှီးမြှုပ်နှံငွေမှာ အမေရိကန်ဒေါ်လာ ၂၅၆.၁၀၇၂ မီလီယံ ဖြစ်ပါသည်။ တည်ဆောက်ရေးကာလသည် ၂ နှစ်ဖြစ်၍ စီမံကိန်း လည်ပတ်ခြင်း ကာလမှာ ၂၅ နှစ် (၁၀ နှစ်လျှင် တစ်ကြိမ်နှုန်းဖြင့် နှစ်ကြိမ်သက်တမ်းတိုး) ဟူ၍ ဖြစ်ပါသည်။ စီမံကိန်းပိတ်သိမ်းခြင်းကာလမှာ ၂ နှစ် ဖြစ်ပါသည်။

စီမံကိန်းလည်ပတ်ခြင်းကာလအတွင်းတွင် နိုင်ငံခြားသား ၁၀၀ ဦးအပါအဝင် ဘိလပ်မြေလိုင်း ၂ လိုင်းအပြည့်အဝလည်ပတ်လျှင် ၀န်ထမ်း ၄၅၀ ဦးဖြစ်သည်။

နည်းစနစ်မှာ အခြောက်နည်းစဉ် ဖြစ်၍ စက်ရုံမှ Portland ဘိလပ်မြေ ၂ လိုင်း တစ်ရက်လျှင် ၁၀,၀၀၀ တန် ထုတ်လုပ်နိုင်ပါသည်။

စီမံကိန်းနေရာသည် လျှပ်စစ်ဓာတ်အား ကို ရွှေစာရုံ ဓာတ်အားခွဲရုံမှ ရယူပါမည်။ သို့သော် ကုမ္ပဏီသည် လုံလောက်သော ဓာတ်အားရရှိရန် အတွက် ၂ x ၂၀ MW ကျောက်မီးသွေးသုံး လျှပ်စစ်ဓာတ်အားပေး စက်ရုံ တည်ဆောက်ရန် စီစဉ်ထားပါသည်။

ရေကို မြစ်ငယ်မြစ်မှ ရယူပါမည်။

လောင်စာဆီများမှာ- ဒီဇယ်၊ ဓာတ်ဆီနှင့် အင်ဂျင်ဆီ အစရှိသည်တို့ ဖြစ်ပါသည်။

ကုန်ကြမ်းပစ္စည်းများမှာ ထုံးကျောက်၊ သံကျောက်၊ သဲ၊ ရွှံ့စေး၊ ဂေါ်ဒန် နှင့် ကျောက်မီးသွေးဖြစ်ပါသည်။ ထုံးကျောက်ကို မြလိပ်တောင်မှ ရရှိ၍ သဲ၊ ရွှံ့စေး ကို စဉ့်ကိုင်မြို့နယ်မှ ဝယ်ယူပါမည်။ သံကျောက်ကို ပြင်ဦးလွင် မြို့နယ်နှင့် ဂေါ်ဒန် ကို သီပေါမြို့နယ်မှ ဝယ်ယူပါမည်။ အရည်အသွေး နိမ့်သော ကျောက်မီးသွေး ကို မော်လိုက် မြို့နယ်မှ ရရှိပြီး အရည်အသွေးကောင်းသော ကျောက်မီးသွေး ကို အင်ဒိုနီးရှားနှင့် သြစတြေးလျ မှ တင်သွင်းပါမည်။

နည်းပညာ၊ ထုတ်လုပ်မှုလုပ်ငန်းစဉ် အကျဉ်းချုပ်

ဘိလပ်မြေထုတ်လုပ်ခြင်းတွင် အဓိက အဆင့် ၇ ဆင့်ရှိပါသည်။

- ၁) တူးဖော်ခြင်း - အဓိကုန်ကြမ်းများသော ထုံးကျောက်ကို တူးဖော်ခြင်း
- ၂) ထုံးကျောက်၊ သံကျောက်၊ သဲနှင့် ရွှံ့စေးတို့ကို ကြိတ်ခွဲခြင်းနှင့် သမစေရန် ရောစပ်ခြင်း
- ၃) ကြေညက်စေရန် ကြိတ်ခြေခြင်း၊ ကုန်ကြမ်းများဖြစ်သော ထုံးကျောက်၊ သံကျောက်၊ သဲနှင့် ရွှံ့စေးတို့ကို ယာယီသိုလှောင်၍ ကြိတ်ခြေခြင်း
- ၄) ကျောက်မီးသွေးအသုံးပြု၍ အပူပေးခြင်း
- ၅) အအေးခံခြင်းနှင့် ယာယီသိုလှောင်ခြင်း
- ၆) ဂေါ်ဒန်ကျောက်ထပ်ထည့်၍ ပေါင်းစပ်ကြိတ်ခြေခြင်း
- ၇) ဘိလပ်မြေ သိုလှောင်၊ ပါကင်ထုတ်၊ ရောင်းချခြင်း

စီမံကိန်းဆောင်ရွက်ခြင်းအချိန်ဇယား

အချိန်ဇယားမှာ ယာယီသာဖြစ်သည်။

- အကြိုတည်ဆောက်ရေးကာလ - ၁ နှစ် (ခန့်မှန်း)
- တည်ဆောက်ရေးကာလ - ၂ နှစ်
- စီမံကိန်းလည်ပတ်ခြင်းကာလ - ၂၅ နှစ် (၁၀ နှစ် ၂ ကြိမ် သက်တမ်းတိုးနိုင်)
- စီမံကိန်းပိတ်သိမ်းခြင်း/ပြန်လည်ရှုန်သန်ခြင်းကာလ - ၂ နှစ်

(အမှန်တစ်ကယ်မှာ လက်ရှိအချိန်တွင် စီမံကိန်းသည် အကြိုတည်ဆောက်ရေးကာလအတွင်းသာဖြစ်သည်)

စီမံကိန်းအားအခြားဆောင်ရွက်နိုင်သော ကိစ္စရပ်များ

အခြားဆောင်ရွက်နိုင်သော ကိစ္စရပ်များကို စီမံကိန်းနေရာ/တည်နေရာ အခြားဆောင်ရွက်နိုင်သော၊ နည်းပညာ အခြားဆောင်ရွက်နိုင်သော၊ စွမ်းအင် အခြားဆောင်ရွက်နိုင်သော၊ ထောက်ပံ့မှု အခြားဆောင်ရွက်နိုင်သော၊ လုပ်ဆောင်ချက်များ အခြားဆောင်ရွက်နိုင်သော တို့ကို ထည့်သွင်းစဉ်းစားထားပါသည်။ ဘာမျှမလုပ်လျှင် ဘာစီမံကိန်းမှ မဖြစ်လာပေ။

ဘိလပ်မြေစက်ရုံစီမံကိန်းနေရာသည် နေရာအတည် တကျရှိရမည်ဖြစ်၍ ၎င်းနေရာသည် အဓိကသယ်ယူပို့ဆောင်ရေး ရည်ရွယ်ချက်အတွက် ထုံးကျောက်တောင်နှင့် အနီးအနားတွင် ရှိရမည်။ မြလိတ်တောင်သည် စီမံကိန်းနေရာအတွက် ကောင်းမွန်သောနေရာဖြစ်သည်။

နည်းပညာအနေဖြင့် အစိုလုပ်ငန်းစဉ် နည်းပညာထက် အခြောက်လုပ်ငန်းစဉ် နည်းပညာ ကို ရွေးချယ်ထားပါသည်။ နှစ်ပေါင်းကြာလာသည်နှင့်အမျှ အကျိုးသက်ရောက်မှု ရှိပါသည်။

ကုမ္ပဏီ လျှပ်စစ် ဓာတ်အားအတွက် ၂ x ၂၀ MW ကျောက်မီးသွေးလျှပ်စစ်ဓာတ်အားပေး စက်ရုံ တည်ဆောက်မည်ဖြစ်သည်။

စွမ်းအင်ချွေတာခြင်းအနေဖြင့် ကုမ္ပဏီသည် ၉ မဂ္ဂါဝပ် စွန့်ပစ်အပူသုံးစနစ် တည်ဆောက်ရန် အစီအစဉ် ရှိပါသည်။

အထောက်အပံ့အခြားဆောင်ရွက်နိုင်သော နည်းလမ်းအတွက် ကုမ္ပဏီသည် ယခင်ရှေးရိုး သုံးစွဲခြင်းစနစ်ကို လိုက်နာခြင်းထက် ရေ၊ လောင်စာဆီနှင့် စွမ်းအင် ထိန်းသိမ်းသုံးစွဲခြင်း နိယာမကို လိုက်နာပါမည်။

၎င်းလုပ်ဆောင်မှုများအတွက် ကုမ္ပဏီသည် အလုပ်လုပ်ကိုင်ရာတွင် ဓလေ့ထုံးစံ/သမားရိုးကျ နည်းလမ်းဟောင်းများကို လိုက်နာခြင်း ထက် လုပ်သားများကို ကောင်းမွန်စွာ အလုပ်လုပ် လုပ်ကိုင်ခြင်း အလေ့အကျင့်များ၊ ကောင်းမွန်သော ဘေးကင်းလုံခြုံရေး အလေ့အကျင့်များ၊ ကောင်းမွန်သော ပတ်ဝန်းကျင် ထိန်းသိမ်းရေး အလေ့အကျင့်များကို လေ့ကျင့်သင်ကြားပေးပါမည်။

စီမံကိန်း မလုပ်ဆောင်ခြင်း ကို ထည့်သွင်းစဉ်းစားမည် မဟုတ်ပါ။ စီမံကိန်း မလုပ်ဆောင်သော အခြား ရွေးချယ်စရာသည် နယ်မြေ၊ ဒေသ နှင့် နိုင်ငံ ဖွံ့ဖြိုးတိုးတက်ရေးကို တစ်စုံတစ်ရာ အထောက်အကူမပြု နိုင်သောကြောင့် ဖြစ်ပါသည်။ တန်ဖိုးကြီးသော ထုံးကျောက်သယံဇာတများ ထုတ်ယူခြင်း မပြုဘဲ ဆက်လက် တည်ရှိနေစေလျှင် ယင်းဧရိယာသည်လည်း ဖြစ်ထွန်းမှု မရှိသော မိုးနည်းသော မြေဧရိယာ အဖြစ် ဆက်လက် တည်ရှိနေမည် ဖြစ်ပါသည်။

ပတ်ဝန်းကျင်အခြေအနေ

အခန်း(၄)သည် ပတ်ဝန်းကျင်အခြေအနေ အသေးစိတ်အကြောင်းအရာ ဖြစ်သည်။ နယ်ပယ် အတိုင်းအတာသတ်မှတ်ခြင်း ကွင်းဆင်းဆောင်ရွက်ချိန်အတွင်းတွင် လျင်မြန်သော ကွင်းဆင်းဆောင်ရွက် ခြင်းတစ်ခု ဆောင်ရွက်ခဲ့ပါသည်။ ပြီးပြည့်စုံသော ကွင်းဆင်းဆောင်ရွက်ခြင်းတစ်ခုကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း(EIA) လေ့လာမှုတွင် ဆောင်ရွက်ခဲ့ပါသည်။ ပတ်ဝန်းကျင်၏ ရုပ်ပိုင်းဆိုင်ရာ၊ ဇီဝပိုင်းဆိုင်ရာ၊ လူမှုစီးပွားရေးဆိုင်ရာ၊ ယဉ်ကျေးမှုဆိုင်ရာနှင့် မျက်စိပဒေသာဖြစ်သော ရှုခင်းရှုကွက်ဆိုင်ရာတို့ကို လေ့လာပါသည်။

သတ်မှတ်ထားသော လေ့လာသည့် ဧရိယာမှာ- ၂ မိုင် အချင်းဝက် (၁၂.၆ စတုရန်း မိုင်) ဖြစ်ပါသည်။ စက်ရုံသည် သဘာဝ ပတ်ဝန်းကျင် နှင့် လိုက်လျောညီထွေ ဖြစ်စေသော စီးပွားရေးကို အခြေခံသည့် ခေတ်မီ စက်ရုံ ဖြစ်သောကြောင့် ဖြစ်ပါသည်။ ဖုန်မှုန့်ထွက်ရှိမှုကို လျော့ချရန် စက်ရုံ တွင် စစ်ထုတ်အိတ် ၅၈ ခု (မီးခိုးခေါင်းတိုင်မှ ပုံသေ ထုတ်လွှတ်မှု နှင့် အခြားသောနေရာတိုင်းမှ ဖုန်မှုန့် ထွက်ရှိမှု ၂ ခု လုံးအတွက်) ရှိပါမည်။ တည်ငြိမ်သော အပူချိန် အမြင့် နှင့် ပြီးပြည့်စုံသော လောင်ကျွမ်းမှု ဖြစ်စေရန် လုပ်ဆောင်ပါမည်။ ၎င်း တို့သည် PM, SO₂ နှင့် NO_x ကို လျော့ချနိုင်ပါသည်။ မီးခိုးမည်းများ အလုံးအရင်း ထုတ်လွှတ်ပြီး သက်ရောက်မှု များသော ဘီလပ်မြေ စက်ရုံ အဟောင်းများနှင့် မတူညီသည်မှာ ဖြေလျော့နိုင်သည့် နည်းလမ်းများ လုပ်ဆောင်ခြင်းဖြင့် သက်ရောက်မှုကို အတော်လေးလျော့ချနိုင်ပါသည်။ သက်ရောက်မှုများကို - ၂ မိုင် အချင်းဝက် အတွင်း မြင်နိုင်ပြီး ခံစားသိရှိနိုင်ပါသည်။

၁၂.၆ စတုရန်း မိုင် အတွင်းတွင် အသေးစိတ် လုပ်ဆောင်မှုများကို လက်တွေ့ကျကျ လုပ်ဆောင်နိုင်ပါသည်။

ဧရိယာ တစ်ခုလုံးသည် နိုင်ငံ၏ အပူပိုင်းဇုန် နယ်မြေ အတွင်း ဖြစ်ပါသည်။ ဧရိယာသည် မြောက်ဘက်မှ တောင်ဘက်သို့ သွယ်တန်းနေသော နိမ့်သော တောင်ကုန်း/တောင်တန်းများ၊ မြေပြန့် အနေအထားနှင့် လှိုင်းထနေသော မြေအနေအထားတို့ ပါဝင်ပါသည်။

စီမံကိန်း အလယ်ဗဟိုမှ အရှေ့ဘက်၂.၅ မိုင် အကွာရှိ မြစ်ငယ်မြစ်မှ ရေကို ရယူပါသည်။ အနီးနားရှိ အနောက်မြောက်ဘက် ၁.၂၅ မိုင်အကွာတွင် ထုံးကျောက်ရယူမည့် မြလိပ်တောင်ရှိပါသည်။

အနောက်တောင်ဘက် ၁.၈ မိုင် တွင် နတ်ရေကန် ကျေးရွာ ရှိ၍ အနောက်မြောက်ဘက် ၃ မိုင် တွင် ကန်တွင်း ကျေးရွာ ရှိပါသည်။

ရုပ်ပိုင်းဆိုင်ရာ၊ ဇီဝပိုင်းဆိုင်ရာ၊ လူမှု-စီးပွားရေးဆိုင်ရာ၊ ယဉ်ကျေးမှုနှင့် မျက်စိပဒေသာဖြစ်သော ရှုခင်းရှုကွက်များတို့ကို လေ့လာ၍ အခြေခံအချက်အလက်များ ကောက်ယူခဲ့ပါသည်။

မိုးလေဝသအချက်အလက်များကို ကျောက်ဆည်မိုးလေဝသဌာနမှ ရယူထားပါသည်။ အမြင့်ဆုံး မိုးရေချိန်မှာ ၄၅.၀၂ လက်မ (၂၀၁၄) ဖြစ်သည်။

အခြားရုပ်ပိုင်းဆိုင်ရာများဖြစ်သော ဥပမာ-မြေမျက်နှာသွင်ပြင်၊ ဘူမိဗေဒ၊ ထိတွေ့လေ အရည်အသွေး၊ ဆူညံသံ၊ တုန်ခါမှုနှင့် ရေအရည်အသွေး တို့ကို လေ့လာမှု၍ မှတ်တမ်းတင်ခဲ့ပါသည်။ အဆိုပါ လေ၊ ရေနှင့် မြေအရည်အသွေးများကို အခန်း (၄) တွင်ထည့်သွင်းဖော်ပြထားပါသည်။ တန်ဖိုးများကို ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဦးစီးဌာနမှချမှတ်ထားသော အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်တို့ဖြင့် နှိုင်းယှဉ်ထားပါသည်။ အများစုမှာ လမ်းညွှန်ချက်တန်ဖိုးအောက်တွင် ရှိပါသည်။

ဇီဝမျိုးစုံမျိုးကွဲလေ့လာခြင်းအရ အပင်မျိုးစိတ်(၉၇)၊ ငှက်မျိုးစိတ်(၉၅)၊ ကုန်းနေရေနေတွားသွား သတ္တဝါ (၁၃)မျိုးနှင့် နို့တိုက်သတ္တဝါ (၇)မျိုးနှင့် ငါးမျိုးစိတ် (၂၂) မျိုးတို့ကို လေ့လာရရှိခဲ့ပါသည်။

လျင်မြန်သော လူမှုစီးပွားရေးဆန်းစစ်ခြင်းကို နတ်ရေကန်ကျေးရွာနှင့် ကန်တွင်းကျေးရွာတို့ကို ပြုလုပ်ခဲ့ပါသည်။ နတ်ရေကန်ကျေးရွာ တွင် လူဦးရေ ၁၃၆၅ ဦး၊ ကန်တွင်းကျေးရွာ တွင် လူဦးရေ ၉၅၀ ဦးတို့ အသီးသီးဖြစ်ကြပါသည်။ ၁၀၀ ရာခိုင်နှုန်းမှာ ဗမာ၊ ဗုဒ္ဓဘာသာများဖြစ်ကြပါသည်။

စိုက်ပျိုးမြေနေရာသည် သီးနှံထွက်ရှိမှုနည်းသော နေရာဖြစ်သည်။ ကျေးရွာ ၂ ရွာလုံး၏ အဓိကစိုက်ပျိုးသီးနှံများမှာ စပါး၊ ဝှမ်း၊ နှမ်း၊ မြေပဲနှင့် နေကြာပန်းတို့ဖြစ်သည်။ နေ့စဉ်ဝင်ငွေမှာ ကျပ် ၄,၀၀၀ မှ ၆,၀၀၀ ဖြစ်သည်။ အလုပ်အကိုင်မရရှိမှု မြင့်မားသည်။

ကျေးရွာ ၂ ရွာလုံးသည် မော်တော်ကားဖြင့်သွားလာနိုင်ပါသည်။ အိမ်ခြေအားလုံး လျှပ်စစ်မီး ရရှိပါသည်။

နတ်ရေကန်ကျေးရွာတွင် ကျောင်းသား/သူ ၂၉၆ ဦး နှင့် ဆရာ/မ ၁၀ ဦး ရှိသော တွဲဖက် အထက်တန်းကျောင်း တစ်ကျောင်း ရှိပါသည်။ ကန်တွင်းကျေးရွာတွင် ကျောင်းသား/သူ ၁၇၃ ဦး နှင့် ဆရာ/မ ၆ ဦး ရှိသော အလယ်တန်းကျောင်း တစ်ကျောင်း ရှိပါသည်။ နတ်ရေကန်ကျေးရွာတွင် ဆေးပေးခန်း တစ်ခုရှိ၍ အနီးဆုံးဆေးရုံမှာ ၁၁ မိုင်အကွာအဝေးတွင် စဉ့်ကိုင်မြို့နယ် ဆေးရုံရှိပါသည်။

ကျေးရွာတွင် ကျေးရွာဆေးပေးခန်း ၁ ခုနှင့် အနီးဆုံး ဆေးရုံမှာ ၁၁ မိုင် အကွာ စဉ့်ကိုင်မြို့တွင် ဖြစ်ပါသည်။

အိမ်ထောင်စုအများစုသည် ပျမ်းမျှအနက် ၈၀-၁၀၀ ပေ အနက်ရှိသော ရေတွင်းမှ ရေကို ရယူပါသည်။

အိမ်ထောင်စုအများစုမှာ ချက်ပြုတ်ခြင်းအတွက် လျှပ်စစ်မီးကို အသုံးပြုသော်လည်း အချို့မှာ ချက်ပြုတ်ခြင်းအတွက် လောင်စာထင်းကို အသုံးပြုပါသည်။

နတ်ရေကန်ကျေးရွာတွင် ဘုန်းကြီး ၁၀ ဦး ရှိသော ဗုဒ္ဓဘာသာ ဘုန်းကြီးကျောင်း တစ်ကျောင်း ရှိ၍ ကန်တွင်းကျေးရွာတွင် ဘုန်းကြီးတစ်ပါးရှိသော ဗုဒ္ဓဘာသာ ဘုန်းကြီးကျောင်း တစ်ကျောင်းရှိပါသည်။ ကျေးရွာသား အားလုံးမှာ ဗမာ၊ ဗုဒ္ဓဘာသာ များဖြစ်ကြသော်လည်း အချို့မှာ- နတ် ကို ကိုးကွယ်မှုများ ရှိနေဆဲဖြစ်ပါသည်။

လူမှုစီးပွားအခြေအနေကို အသေးစိတ် လေ့လာမှုကို နောက်ပိုင်း အခန်း (၅) တွင် ထည့်သွင်းဖော်ပြပါမည်။

သက်ရောက်မှု နှင့်ဆန်းစစ်ခြင်းအကဲဖြတ်ခြင်းနှင့် ဖြေလျော့နိုင်သော နည်းလမ်းများ

စီမံကိန်း ကာလ များဖြစ်သော အကြိုတည်ဆောက်ရေးကာလ၊ တည်ဆောက်ရေးကာလ၊ စီမံကိန်းလည်ပတ်ခြင်းကာလနှင့် စီမံကိန်းပိတ်သိမ်းခြင်းကာလ/ပြန်လည်ရှင်သန်ခြင်းကာလ အတွင်းတွင် တွေ့နိုင်သော သက်ရောက်မှုများ/ဖြစ်နိုင်ခြေရှိသော သက်ရောက်မှုများကို အောက်တွင် စာရင်းပြုစု ဖော်ပြထားပါသည်။

ဖြေလျော့နိုင်မည့် နည်းလမ်းများကို အောက်တွင် ဇယားပုံစံဖြင့် အကျဉ်းချုပ်ဖော်ပြထားပါသည်။ (အသေးစိတ်ကို အခန်း-၆ တွင် ဖော်ပြထားပါသည်)

(I) အကြိုတည်ဆောက်ခြင်းကာလအတွင်း

စဉ်	သက်ရောက်မှု/ဖြစ်နိုင်ခြေရှိသော သက်ရောက်မှု	ဖြေလျော့နိုင်မည့်နည်းလမ်း
၁	တက်ကြွလှုပ်ရှားသူများနှင့် အစွန်းရောက် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး သမားများကြောင့် စီမံကိန်းကို လိုလားသူနှင့် မလိုလားသူဟူ၍ အုပ်စုနှစ်စု ကွဲခြင်း	<ul style="list-style-type: none"> - ဤဖြစ်နိုင်ခြေရှိသော လူမှုရေးသက်ရောက်မှုအတွက် လျင်မြန်သော ဖြေရှင်းနိုင်မည့်နည်းလမ်းမရှိပေ။ - ဒေသအဖွဲ့အစည်းများနှင့် ကောင်းမွန်သော ဆက်ဆံရေးထိန်းသိမ်းခြင်း - CSR အစီအစဉ်များ လုပ်ဆောင်ခြင်း
၂	ဖြစ်နိုင်ခြေရှိသော မြေဈေးတက်ခြင်း	<ul style="list-style-type: none"> - ဖြေလျော့နိုင်မည့်နည်းလမ်းမရှိပေ (ငွေကြေးဖောင်းပွမှုကို မကုစားနိုင်ပေ) - မြေဈေးတက်မှုတွင် ကုမ္ပဏီဝန်ထမ်းများ မပါဝင်ပေ

(II)တည်ဆောက်ရေး ကာလအတွင်း

စဉ်	သက်ရောက်မှု	ဖြေလျော့နိုင်မည့်နည်းလမ်း
၁	လေအရည်အသွေးအပေါ် သက်ရောက်မှု	<ul style="list-style-type: none"> - အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်ကို လိုက်နာခြင်း - အကြိုတည်ဆောက်ရေးကာလအတွင်းတွင် မီးခိုးထွက်နည်းသောစက်ကိရိယာ၊ ယာဉ်ယန္တရားများကို ဝယ်ယူရန် စီစဉ်ခြင်း။ - မီးခိုးထွက်နည်းစေရန် စက်ကိရိယာ၊ ယာဉ်ယန္တရားများကို ပုံမှန်ထိန်းသိမ်း၊ ပုံမှန်ဆီထိုးပြုလုပ်ခြင်း - မီးခိုးထွက်နည်းသော စက်ကိရိယာ၊ ယာဉ်ယန္တရားများ ကို အသုံးပြုခြင်း၊ ဆာလဖာနည်းသော လောင်စာဆီ အသုံးပြုခြင်း - အမှိုက်များကို ဟင်းလင်းပွင့်တွင် မီးရှို့ခြင်းမှ ရှောင်ရှားခြင်း - ဖုန်ထခြင်းအတွက် ရေဖျန်းခြင်း - ယာဉ်သွားလာမှုကို ကန့်သတ်ခြင်း၊ ရွံ့လမ်းများကို ရှင်းလင်း ထိန်းသိမ်းခြင်း - မီးခိုး သို့မဟုတ် ဖုန်မှုန့်များဖြင့် အချိန်ကြာမြင့်စွာ လုပ်ရ သူများ အတွက် PPE ထောက်ပံ့ပေးခြင်း
၂	ဆူညံသံနှင့် တုန်ခါမှု	<ul style="list-style-type: none"> - အကြိုတည်ဆောက်ရေးကာလအတွင်းတွင် ဆူညံသံနည်းသော စက်ကိရိယာ၊ ယာဉ်ယန္တရားများကို ဝယ်ယူရန် စီစဉ်ခြင်း - ဆူညံသံအတွက် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ (ထုတ်လွှတ်မှု) လမ်းညွှန် ချက်ကို လိုက်နာခြင်း - ညအချိန်တွင် တည်ဆောက်ရေးလုပ်ငန်းများလုပ်ခြင်းကို ရှောင်ရှားခြင်း - ဆူညံသံဖြင့် အချိန်ကြာမြင့်စွာ လုပ်ရသူများအတွက် PPE ထောက်ပံ့ပေးခြင်း - စက်ယန္တရား၊ စက်ကိရိယာနှင့် ယာဉ်ယန္တရားများ၏ တုန်ခါမှုကို စီမံခန့်ခွဲခြင်း - ယာဉ်ယန္တရားများ၏ အမြန်နှုန်းကို သတ်မှတ်ခြင်း

၃	မြေဆီလွှာအပေါ် သက်ရောက်မှု	<ul style="list-style-type: none"> - မြေကြီးတူးဖော်ခြင်းလုပ်ငန်းလုပ်ချိန်အတွင်းတွင် အပေါ်ယံမြေဆီလွှာ ကို သီးသန့်ခွဲပုံထားခြင်း - အပေါ်ယံမြေဆီလွှာကို လမ်းဖောက်လုပ်ခြင်း သို့မဟုတ် အဆောက်အဦဆောက်လုပ်ခြင်း အတွက် အသုံးမပြုခြင်း - ပြန်လည်ရှင်သန်ခြင်းလုပ်ငန်းတွင် အပေါ်ယံမြေဆီလွှာကို အကျိုးရှိစွာ အသုံးပြုခြင်း - မည်သည့်အကြောင်းနှင့်မဆို မြေဆီလွှာညစ်ညမ်းမှုကို ရှောင်ရှားခြင်း - ဆီလျှံကျလျှင် ချက်ချင်းသန့်ရှင်းစေခြင်း၊ ရေဖြင့်ဆေးချခြင်း မပြုလုပ်၍ စုပ်ယူနိုင်သည့် လွှစာမှုန့်များကို အသုံးပြုခြင်း - ယာဉ်နှင့် စက်ယန္တရားများကို လောင်စာဆီ ယိုစိမ်း၍ မြေဆီလွှာသို့ စိမ့်ဝင်မှုမဖြစ်စေရန် သေချာစွာ ထိန်းသိမ်းခြင်း - တည်ဆောက်ရေးလုပ်ငန်းများမှစွန့်ပစ်ပစ္စည်းများ(မြေ၊ ကျောက်) ကို သတ်မှတ်ထားသော နေရာတွင် စုပုံခြင်း - နေထိုင်သည့်စခန်းများမှ အစိုင်အခဲစွန့်ပစ္စည်းနှင့် အရည်စွန့်ပစ္စည်းများကို သတ်မှတ်ထားသော နေရာတွင် စွန့်ပစ်ခြင်း - ကောင်းမွန်သော အလေ့အထများကို ဝန်ထမ်းများအား ပညာပေးခြင်း၊ အမှိုက်မစွန့်ပစ်ခြင်း၊ ဧရိယာကို မညစ်ညမ်းစေခြင်း - မြေဆီလွှာတည်ဆောက်မှုကို ပျက်စီးခြင်းအား ရှောင်ရှား ခြင်း
၄	ရေပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု	<ul style="list-style-type: none"> - တည်ဆောက်ရေးလုပ်ငန်းများ သို့မဟုတ် လမ်းအဆင့်မြှင့်တင်ခြင်းလုပ်ငန်းများတွင် တက်နိုင်သမျှ ရေစီး ကြောင်းများကို ရှောင်ရှားခြင်း - လောင်စာဆီနှင့် အသုံးပြုပြီးသော လောင်စာဆီကို သတ်မှတ်ထားသော နေရာတွင် အတားအဆီးပြုလုပ်၍ သိုလှောင်ခြင်း - ယာဉ်နှင့် စက်ယန္တရားများမှ ဖိတ်စင်၍ ရေညစ်ညမ်းမှု မဖြစ်စေရန် ထိန်းသိမ်းခြင်း - လောင်စာဆီများ ကိုင်တွယ်သောအခါ ရေထဲသို့ မတော်တဆ လျှံကျခြင်းအား ရှောင်ရှားခြင်း၊ လျှံကျခဲ့လျှင် ချက်ချင်းသန့်စင်စေခြင်း - စွန့်ပစ်ပစ္စည်း (အရည်နှင့် အစိုင်အခဲ) ရေထဲသို့ စွန့်ပစ်ခြင်းအား ရှောင်ရှားခြင်း - အပေါ်ယံမြေဆီလွှာကို သဘာဝအတိုင်း အပင်ပေါက်စေခြင်းကြောင့် မြေဆီလွှာတိုက်စားခြင်းကို တားဆီး၍ အပေါ်ယံရေသို့ အနည်ကျစေခြင်းအား သတ်မှတ်ထားခြင်း

၅	စွန့်ပစ်ပစ္စည်းများကြောင့် သက်ရောက်မှု	<ul style="list-style-type: none"> - အမှိုက်များကို ဟင်းလင်းပွင့်တွင် မီးရှို့ခြင်းမှ ရှောင်ရှားခြင်း - ကောင်းမွန်သပ်ရပ်သော အလေ့အထများကို ဝန်ထမ်း များအား ပညာပေးခြင်း၊ အမှိုက်များကို မစွန့်ပစ်ခြင်း - တည်ဆောက်ရေးကာလ၏အဆုံးတွင် တည်ဆောက်ရေး ကာလတွင် ကျန်သောပစ္စည်းများကို ပြန်လည် ရောင်းချခြင်း - လောင်စာဆီလျှံကျခြင်းကို ရှောင်ရှားခြင်း၊ လျှံကျခဲ့လျှင် စုပ်ယူနိုင်သည့် လွှစာမှုန့်ကဲ့သို့သော ပစ္စည်းဖြင့် ချက်ချင်း ရှင်းလင်းခြင်း (ရေဖြင့်မဆေးရ) - ဝန်ထမ်းများ၏ နေထိုင်သည့်စခန်းများအတွက် ယာယီ သန့်စင်ခန်းများကို စနစ်တကျ စီမံခြင်း၊ အိမ်သာကျင်းများကို မြေ သို့မဟုတ်ပြာများ ပုံမှန် ဖြူးခြင်း၊ တည်ဆောက်ရေးလုပ်ငန်း ပြီးနောက် အိမ်သာကျင်း အားလုံးကို ပြန်ဖြည့်ခြင်း
၆	ဇီဝမျိုးစုံမျိုးကွဲအပေါ် သက်ရောက်မှု	<ul style="list-style-type: none"> - လမ်းဖောက်ခြင်းတွင် အပင်များကို လိုအပ်သည်ထက်ပို မရှင်းလင်းခြင်း၊ အပင်ဖယ်ရှားခြင်းကို ကန့်သတ်ခြင်း၊ အပင်ကြီးများခုတ်ခြင်းကို တက်နိုင်သမျှ ရှောင်ရှားခြင်း - အလင်းဖြင့်အစာချက်လုပ်သော အရွက်နှင့် အပင်များပေါ် ဖုန်မှုန့်များ တင်နေခြင်းကို ထိန်းချုပ်ခြင်းနှင့် လျော့ချခြင်း - ထင်းစုဆောင်းခြင်းကို ကန့်သတ်ခြင်း၊ လောင်စာအတွက် အပင်များခုတ်ခြင်းကို မပြုလုပ်ခြင်း၊ သို့ပေမယ့် လဲကျ နေသော အပင်များမှ လောင်စာထင်းစုဆောင်းခြင်း၊ ချက်ပြုတ်ခြင်းအတွက် အပင်ခြောက် သို့မဟုတ် မီးသွေးကို အသုံးပြုခြင်း - ဟင်းလင်းပွင့်တွင် အမှိုက်များကို မီးရှို့ခြင်းအား ရှောင်ရှား ခြင်း - မီးအန္တရာယ်နှင့် ပတ်သပ်၍ ဝန်ထမ်းများကို ပညာပေးခြင်း၊ အမှိုက်များအားလုံးသည် မီးလောင်တက်သောကြောင့် မီးလောင် နေသော စီးကရက်ဖင်စီခံ များကို ဂရုမစိုက် စွန့်ပစ်ခြင်းကို တားမြစ်ခြင်း၊ - ဝန်ထမ်းများကို ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး အသိပညာ ပေးခြင်း - ငှက်နှင့် တိရစ္ဆာန်များ၏ မှီတင်းနေထိုင်ကျက်စားရာ နေရာ နောက်ယှက်ခံရမှုကို တားဆီးရန် ယာဉ်သွားလာမှုကို ကန့်သတ်ခြင်း - ဝန်ထမ်းများအမဲလိုက်ခြင်းနှင့် ထောင်ချောက်ထောင်ခြင်းကို တားမြစ်ခြင်း

<p>၇</p>	<p>လုပ်ငန်းခွင်ကျန်းမာရေး နှင့် ဘေးအန္တရာယ် သက်ရောက်မှု</p>	<ul style="list-style-type: none"> - ရှေးဦးသူနာပြုသင်တန်းနှင့် မီးဘေးကာကွယ်ရေး သင်တန်းများကို ထောက်ပံ့ပေးခြင်း - ရှေးဦးသူနာပြုဆေးပုံးနှင့် မီးသတ်ဆေးပူးများကို လုံလောက်စွာ ထောက်ပံ့ပေးခြင်း၊ မီးဘေးအန္တရာယ် အတွက် ရေတိုင်ကီများကို ရေအဖြည့်ဖြည့်ထားခြင်း - ကြက်ခြေနီအဖွဲ့အစည်း၊ အရေးပေါ်ဝန်ဆောင်မှု၊ မီးသတ်၊ ရဲစခန်း၊ ဆေးရုံတို့၏ ဖုန်းနံပါတ်နှင့် လိပ်စာများကို အများပြည်သူမြင်သာစေရန် ထားရှိခြင်း - အလုပ်ခွင်နေရာများတွင် ဘေးအန္တရာယ် ကင်းရှင်းရေး စေရန် ဖန်တီးပေးခြင်း - ကောင်းမွန်သော လုပ်ငန်းခွင်အလေ့အထ၊ ကောင်းမွန်အင်ဂျင်နီယာ အလေ့အထ၊ ကောင်းမွန်သော ဘေးအန္တရာယ် ကင်းရှင်းရေး အလေ့အထ၊ ကောင်းမွန်သော သန့်ရှင်းရေး အလေ့အထ များကို ဝန်ထမ်းများအား ပညာပေးခြင်း - နေထိုင်မကောင်းခြင်းနှင့် ဒဏ်ရာရသော ဝန်ထမ်းများကို အနီးဆုံးဆေးရုံသို့ ပို့ဆောင်နိုင်ရန် စီစဉ်ခြင်း - မတော်တဆမှုများကို ရှောင်ရှားခြင်းနှင့် လုပ်ငန်းခွင်နေရာများတွင် မတော်တဆမှု လုံးဝမဖြစ်စေရေး လုပ်ဆောင်ခြင်း - ကျန်းမာရေးနှင့် သန့်ရှင်းစင်ကြယ်စေခြင်းအတွက် ပညာ ပေးခြင်း
<p>၈</p>	<p>ဖြစ်နိုင်ခြေရှိသော လူမှုရေးပြဿနာကြောင့် သက်ရောက်မှု</p>	<ul style="list-style-type: none"> - ဝန်ထမ်းများကို ပညာပေးခြင်းနှင့် စည်းကမ်းတင်းကြပ်ခြင်း၊ မှားယွင်းမှုများပြုလုပ်ခဲ့လျှင် အပြစ်ပေးခြင်း၊ အလုပ်မှ ထုတ်ပယ်ခြင်း - ဒေသအဖွဲ့အစည်းများနှင့် ဆက်ဆံသည့်အခါ ဒေသ၏ ဓလေ့နှင့် ကျင့်ဝတ်များကို လေးစားလိုက်နာရန် ဝန်ထမ်း များကို ပညာပေးခြင်း - စီမံကိန်းနေရာတွင် အရက်သေစာသောက်စားခြင်းအား တားမြစ်ခြင်း - မှားယွင်းမှုများပြုလုပ်ခဲ့လျှင် အပြစ်ပေးခြင်း - ကုမ္ပဏီနှင့် ဒေသခံပြည်သူများ အကြားကောင်းမွန်သော ဆက်ဆံရေး ထားရှိခြင်း - ဒေသခံပြည်သူများ စီမံကိန်းကို အကောင်းမြင်စေရန် လူထုတွေ့ဆုံဆွေးနွေးပွဲများ ပြုလုပ်ခြင်း

		<ul style="list-style-type: none"> - STD အတွက် သေချာ စီမံခန့်ခွဲခြင်း - အမျိုးသားနှင့် အမျိုးသမီးများအဆောင်ကို ခွဲခြားထားခြင်း - တည်ဆောက်ရေး ကန်ထရိုက်တာများအား သူတို့၏အလုပ် သမားများအား စည်းကမ်းလိုက်နာစေခြင်း - ကျန်းမာရေးနှင့် သန့်ရှင်းစင်ကြယ်စေခြင်းအတွက် ပညာ ပေးခြင်း
၉	ဖြစ်နိုင်ခြေရှိသော လုံခြုံရေးပြဿနာ	<ul style="list-style-type: none"> - ခြံဝန်းကို သေချာစွာ ခြံစည်းရိုးခတ်ခြင်း - လုံလောက်သော လုံခြုံရေးဂိတ်များနှင့် လုံခြုံရေးဝန်ထမ်း များကို ထားရှိခြင်း - ဝန်ထမ်းများအား (တည်ဆောက်ရေးလုပ်သားများ) အနီး ပတ်ဝန်းကျင်ရှိ ကျေးရွာများမှ ဒေသခံများနှင့် ခွင့်ပြုချက် မရှိပဲ ရောနှောမနေစေခြင်း - အဆောက်အဦပစ္စည်းများကို စတိုထဲတွင်သိမ်းဆည်းစေခြင်းနှင့် တက်နိုင်သမျှ သော့ခတ် ထားခြင်း - တည်ဆောက်ရေးကန်ထရိုက်တာများကို သူတို့၏ ဝန်ထမ်းများ အား စည်းကမ်းလိုက်နာစေရန် ပြောကြားခြင်း - ဝန်ထမ်းများစည်းကမ်းဖောက်ဖျက်လျှင် အပြစ်ပေးခြင်း သို့မဟုတ် အလုပ်မှထုတ်ပယ်ခြင်း

(III)စီမံကိန်းလည်ပတ်ခြင်းကာလအတွင်း

စဉ်	သက်ရောက်မှု	ဖြေလျော့နိုင်မည့်နည်းလမ်း
၁	လေပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု	<ul style="list-style-type: none"> - ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနမှထုတ်ပြန်ထားသော အမျိုးသားပတ်ဝန်းကျင် ဆိုင်ရာအရည်အသွေး(ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်အတိုင်း လိုက်နာခြင်း - မြေပြင်ပေါ်ရှိ မြက်နှင့် အရွက်များကို လိုအပ်သည်ထက် ပိုမိုရှင်းလင်းခြင်း မပြုခြင်း - လေတိုက်ခတ်ခြင်းကြောင့် ဖုန်ထခြင်းကို ကာကွယ်နိုင်ရန် ဧရိယာအားလုံးကို သိပ်သည်းစေခြင်း - ဖုန်မှုန့်များကို လုံလောက်စွာရေဖျန်းခြင်း - ဖုန်ထခြင်းကို လျော့ချရန် ယာဉ်များကို အမြန်နှုန်း သတ်မှတ်ခြင်း

		<ul style="list-style-type: none"> - ယာဉ်သွားလာမှုကို ကန့်သတ်ခြင်း၊ ရွံ့ရှိသော လမ်းများကို ရှင်းလင်း၍ ကောင်းမွန်စွာ ထိန်းသိမ်းခြင်း - ဟင်းလင်းပွင့်တွင် အမှိုက် သို့မဟုတ် စွန့်ပစ်အစိုင်အခဲများကို မီးရှို့ခြင်းအား ရှောင်ရှားခြင်း - မီးခိုးထွက်ရှိမှု လျော့နည်းစေရန် စက်ကိရိယာနှင့် ယာဉ်ယန္တရား များကို ပုံမှန်ထိန်းသိမ်းခြင်း - မီးခိုးထွက်ရှိမှုနည်းသော လောင်စာဆီကို အသုံးပြုခြင်း (ဥပမာ-ဆာလဖာပါဝင်မှု နည်းသော လောင်စာဆီ) - ဖုန်ထွက်ရှိမှု နည်းစေရန် conveyor လိုင်းကို အမိုးအုပ် တပ်ဆင်ခြင်း - ဖုန်မှုန့်ထွက်ရှိမှု ကို လျော့ချနိုင်ရန် အမှုန်းဖမ်းအိတ်များ တပ်ဆင်ခြင်း - SO₂၊ NO_x နှင့်အခြားဂတ်စ်များ ထွက်ရှိမှုနည်းစေရန် လောင်စာကို လုံးဝလောင်ကျွမ်းစေခြင်း - အောက်ကျလာသော ပြာမှုန့်များကို ပုံမှန် စုဆောင်းခြင်း၊ အဆိုပါအမှုန့်များကို ဘိလပ်မြေတွင် ပြန်လည်အသုံးပြုခြင်း - Conveyor လိုင်း၊ clinker၊ ဘိလပ်မြေထုတ်ပိုးသည့် ဌာနနှင့် ဘိလပ်မြေအိတ်များသို့လှောင်သည့်နေရာတို့တွင် PM (ဖုန်) ထွက်ရှိမှုကို လျော့ချခြင်း - ဖုန်မှုန့်နှင့် မီးခိုးထွက်ရှိသည့် နေရာတွင် အချိန်ကြာမြင့်စွာ အလုပ်လုပ်ရသော ဝန်ထမ်းများကို PPE ထောက်ပံ့ခြင်း (မျက်နှာအကာ၊ ပါးစပ်နှင့် နှာခေါင်းစည်း၊ ဂတ်စ်အကာ)
၂	ဆူညံသံနှင့် တုန်ခါမှု	<ul style="list-style-type: none"> - ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနမှထုတ်ပြန်ထားသော အမျိုးသားပတ်ဝန်းကျင် ဆိုင်ရာအရည်အသွေး ထုတ်လွှတ်မှု လမ်းညွှန်ချက်မှ ဆူညံသံ အတိုင်း လိုက်နာခြင်း - ယာဉ်နှင့် စက်ယန္တရားကြီးများ သွားလာမှုကို ကန့်သတ်ခြင်း - သင့်တော်သော စက်ယန္တရားနှင့် ယာဉ်များကိုရွေးချယ် အသုံးပြုခြင်း (ဆူညံသံ ထွက်ရှိမှုနည်းသော) - စက်ယန္တရားနှင့် ယာဉ်များကို ဆူညံသံထွက်ရှိမှု နည်းစေရန် ပုံမှန်ပြုပြင် ထိန်းသိမ်းခြင်း

		<ul style="list-style-type: none"> - စက်ရုံပတ်ပတ်လည်တွင် အသံစုပ်ယူနိုင်စေရန် အစိမ်းရောင် တန်းများ လုပ်ဆောင်ခြင်း - စက်ယန္တရားနှင့် စက်ကိရိယာများအတွက် တုန်ခါမှုလျော့ချ စေရန် သင့်တော်သော အောက်ခံဒီဇိုင်းကို ပြုလုပ်ခြင်း - စက်ယန္တရားနှင့် စက်ကိရိယာများအတွက် တုန်ခါမှုလျော့ချ စေရန် လမ်းကို ချောမွေ့နေစေခြင်း - ဆူညံသံဖြင့် အချိန်ကြာမြင့်စွာ လုပ်ကိုင်ရသော ဝန်ထမ်းများကို PPE ထောက်ပံ့ခြင်း ဥပမာ-နားအကာ - ဆူညံသံသည် စံချိန်စံညွှန်း အတွင်း (၈၅-၉၀ dBA ထက်မပို) ရှိမရှိ ပုံမှန် စစ်ဆေးခြင်း
၃	မြေဆီလွှာအပေါ် သက်ရောက်မှု	<ul style="list-style-type: none"> - မြေဆီလွှာအပေါ် သက်ရောက်မှုများကိုလျော့ချခြင်းနှင့် အကျိုးသက်ရောက်သော စီမံခန့်ခွဲခြင်းများကို ပြုလုပ်ခြင်း - ဖြစ်နိုင်လျှင် မြေတိုက်စားခြင်းနှင့် မြေပြိုကျခြင်းကို ကာကွယ်ရန် မြေထိန်းနံရံတည်ဆောက်ခြင်း - မည်သည့်အကြောင်းနှင့်မဆို မြေဆီလွှာညစ်ညမ်းမှုကို ရှောင်ရှားခြင်း - မြေဆီလွှာပျက်စီးခြင်းကို တားဆီးခြင်းနှင့် ရှောင်ရှားခြင်း
၄	ရေအပေါ်သက်ရောက်မှု	<ul style="list-style-type: none"> - အရှေ့ဘက်တွင် မြစ်ငယ်မြစ်ရှိပါသည်။ လုပ်ဆောင်ချက်များ သည်လည်း ရေထဲသို့မရောက်စေခြင်း - လောင်စာဆီကို မြစ်နှင့် ဝေးကွာသော နေရာတွင် ထားခြင်းနှင့် လျှံကျမှုမဖြစ်စေရန် အကာအရန်များဖြင့် ထားရှိခြင်း - လောင်စာဆီကိုင်တွယ်သည့်အခါ အပေါ်ယံရေဆီသို့ မတော်တဆ လျှံကျခြင်းကို ရှောင်ရှားခြင်း၊ အကယ်၍ လျှံကျခဲ့လျှင် ချက်ချင်း သန့်စင်ခြင်း - စွန့်ပစ်ပစ္စည်း (အရည် နှင့် အစိုင်အခဲ) များကို ရေထဲသို့ စွန့်ပစ်ခြင်းကို ရှောင်ရှားခြင်း - ရေသုံးစွဲမှုကို လျော့ချ၍ ရေကို ထိန်းသိမ်းခြင်း၊ ဖြစ်နိုင်လျှင် ဖုန်မှုန့်ဖျန်းခြင်းနှင့် အပင်စိုက်ခြင်းအတွက် ရေကို ပြန်လည် သုံးစွဲခြင်း - မြေဆီလွှာနှင့် မြေအောက်ရေညစ်ညမ်းမှုကို ကာကွယ်ရန် စီမံခန့်ခွဲခြင်း

		<ul style="list-style-type: none"> - မြေဆီလွှာနှင့် မြေအောက်ရေတို့အား ညစ်ညမ်းမှုကို ကာကွယ်ရန် စီမံခန့်ခွဲခြင်း - လောင်စာဆီ သိုလှောင်ခြင်းအတွက် သတ်မှတ်ထားသော နေရာတွင် ပြုလုပ်ခြင်း - ဆီလျှံကျခြင်းကြောင့် မြေအောက်ရေ ညစ်ညမ်းမှုကို တားဆီးရန် ယာဉ်ယန္တရားနှင့် စက်ယန္တရားများကို လုံလောက်စွာ ထိန်းသိမ်းခြင်း - လောင်စာဆီ ကိုင်တွယ်နေချိန်တွင် လျှံကျခြင်းကို ရှောင်ရှားခြင်း - အကယ်၍ လျှံကျခဲ့လျှင် ချက်ချင်း သန့်စင်ခြင်း၊ ရေဖြင့် ဆေးကြောခြင်း မပြု။ စုပ်ယူနိုင်သော အဝတ် သို့မဟုတ် လွှာစာမှုန်ဖြင့် သန့်စင်ခြင်း
၅	စွန့်ပစ်ပစ္စည်းများ ကြောင့် သက်ရောက်မှု	<ul style="list-style-type: none"> - ထွက်ရှိသည့် စွန့်ပစ်ပစ္စည်းများ အထူးသဖြင့် ဘီလပ်မြေမှုန့်၊ ပြာနှင့် အခြား လူသုံးစွန့်ပစ်ပစ္စည်းများအားလုံးကို သိရှိထားစေခြင်း - စွန့်ပစ်ပစ္စည်းများ ကိုင်တွယ်စွန့်ပစ်ခြင်းအတွက် ဝန်ထမ်းများကို ညွှန်ကြားထားခြင်း ဥပမာ-သတ်မှတ်ထားသောနေရာ - 5 Rs နိယာမကိုလိုက်နာခြင်း၊ လျော့ချ၊ ပြန်သုံး၊ ပြန်လည်အသုံးပြု၊ ပြန်လည်သုံးစွဲနှင့် ပြန်လည်ဒီဇိုင်းလုပ် - အစိုင်အခဲစွန့်ပစ်ပစ္စည်းများကို အမျိုးအစားခွဲခြားခြင်း၊ အမှိုက်ပုံးများ ခွဲထားခြင်း၊ သတ်မှတ်ထားသောနေရာတွင် စွန့်ပစ်ခြင်း - စွန့်ပစ်ရေစီမံခန့်ခွဲမှုကို အစီအစဉ်ရေးဆွဲခြင်း - ရေသုံးစွဲမှုကို လျော့ချခြင်း - ဝန်ထမ်းများကို ရေသုံးစွဲခြင်းအတွက် ပညာပေးခြင်း - သတ်မှတ်ထားသောနေရာတွင် ယာဉ်များနှင့် စက်ကိရိယာများကို ဆေးကြောခြင်း - အပြင်တွင် စွန့်ပစ်ရေ မစွန့်ပစ်ခြင်း (မြေပြင်ပေါ် သို့မဟုတ် ရေထဲသို့) - ဝန်ထမ်းများကို ကောင်းမွန်သန့်ရှင်းသော အလေ့အထများကို ပညာပေးခြင်း

<p>၆</p>	<p>ဖြစ်နိုင်ခြေရှိသော ယာဉ်ကြောပိတ်ဆို့မှု အပေါ် သက်ရောက်မှု</p>	<ul style="list-style-type: none"> - ယာဉ်ကြောပိတ်ဆို့မှုအတွက် စီမံခန့်ခွဲမှုများ အစီအစဉ် ရေးဆွဲခြင်း (ယာဉ်ကြောပိတ်ဆို့မှု နည်းသော်လည်း၊ လမ်းအသုံးပြုသူအများစုမှာ မော်တော်ဆိုင်ကယ် သမားများ ဖြစ်ကြသည်) - ထရပ်ကားများအတွက် သွားလာမှုလေးရေးဆွဲခြင်း - အမြန်နှုန်းသတ်မှတ်ခြင်း - ဘီလပ်မြေအိတ်များ၊ ကျောက်မီးသွေး၊ ဂေါ်ဒန်ကျောက်များ သယ်ယူသည့်အခါ မိုးကာစအုပ်ထားခြင်း - ကားသမားများကို အရှိန်လျော့မောင်းနှင်ခြင်းအတွက် ပညာပေးခြင်း (အထူးသဖြင့် ထရပ်ကားမောင်းသူများ) - လမ်းမတော်တဆမှု မဖြစ်စေရေး ကြိုးစားဆောင်ရွက်ခြင်း
<p>၇</p>	<p>လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေးပြဿနာ</p>	<ul style="list-style-type: none"> - ဘေးအန္တရာယ်ကင်းရှင်းသော လုပ်ငန်းခွင်ဖြစ်စေရန် ဆောင်ရွက်ခြင်း - လုပ်ငန်းခွင်တွင် မတော်တဆမှုများမဖြစ်စေရန် ကြိုးစား ဆောင်ရွက်ခြင်း - ဝန်ထမ်းများကိုကောင်းမွန်သောအလေ့အထ၊ ဘေးအန္တရာယ် ကင်းသော အလေ့အထ၊ ကောင်းမွန်သော ကျန်းမာရေးနှင့် သန့်ရှင်းစင်ကြယ်စေသော အလေ့အထ ကောင်းများကို ပညာပေးခြင်း - တတ်နိုင်သမျှ မီးဖိုသည်နေရာ အပူကို ကန့်သတ်ခြင်း၊ ပုံမှန်ထိန်းညှိခြင်းနှင့် ထိန်းချုပ်ခြင်း - အပူ၊ ဖုန်မှုန့်၊ မီးခိုး၊ ဆူညံသံအစရှိသည်တို့နှင့် အချိန်ကြာမြင့်စွာ လုပ်ကိုင်ရသော ဝန်ထမ်းများကို PPE လုံလောက်စွာ ထောက်ပံ့ပေးခြင်း - ဝန်ထမ်းများကို အလုပ်မခန့်အပ်မီ ဆေးစစ်ပေးခြင်း - ဘေးအန္တရာယ်ရှိသော ပစ္စည်းများကိုကိုင်တွယ်ခြင်း၊ သယ်ယူ ပို့ဆောင်ခြင်းနှင့် သိုလှောင်ခြင်းအတွက် အကျိုး သက်ရောက်၍ ဘေးအန္တရာယ် ကင်းရှင်းစေသော လုပ်ထုံးလုပ်နည်းများကို ဆောင်ရွက်ခြင်း - မီးနှင့် အရေးပေါ်ကာကွယ်ခြင်းအတွက် အသေးစိတ် အစီအစဉ်ရှိခြင်း - ရှေးဦးသူနာပြုသင်တန်းနှင့် မီးဘေးအန္တရာယ်သင်တန်းများ ပေးခြင်း - မီးဘေးအန္တရာယ် ကိရိယာများကို ထောက်ပံ့ခြင်း

		<ul style="list-style-type: none"> - စက်ရုံတွင် ဆေးပေးခန်း ထားရှိခြင်း - ရှေးဦးသူနာပြုဆေးပုံးများ၊ ဆေးများ ထောက်ပံ့ခြင်း - မီးသတ်တပ်ဖွဲ့၊ အရေးပေါ်ဝန်ဆောင်မှု၊ ကြတ်ခြေနီတပ်ဖွဲ့၊ ဆေးရုံနှင့် ရဲစခန်းဖုန်းနံပါတ်နှင့် လိပ်စာများကို အများမြင်သာသည့် နေရာတွင် ထားရှိခြင်း - ဘိလပ်မြေစက်ရုံအတွက် အာမခံထားရှိခြင်းနှင့် မီးအာမခံ ထားရှိခြင်း
၈	ဖြစ်နိုင်ခြေရှိသော လူမှုရေးပြဿနာ	<ul style="list-style-type: none"> - လူမှုရေးပြဿနာများအတွက် စီမံခန့်ခွဲမှု အစီအစဉ် ရေးဆွဲခြင်း - ဝန်ထမ်းများကို စည်းကမ်းလိုက်နာစေရန် ပညာပေးခြင်း - လုပ်ငန်းခွင်နှင့် ဆိုင်သော စည်းမျဉ်းများ၊ ကျင့်ဝတ်များကို သင်တန်းပေးခြင်း - ဒေသခံများနှင့် ဆက်ဆံသည့်အခါ သင့်တော်သော အပြုအမူများဖြင့် ဆက်ဆံရန် ဝန်ထမ်းများကို ပညာပေးခြင်း၊ ကောင်းမွန်သော ဆက်ဆံမှုများကိုလည်း ထိန်းသိမ်းခြင်း - စည်းကမ်းဖောက်ဖျက်လျှင် အလုပ်ထုတ်ပယ်ခြင်းအထိ အရေးယူ အပြစ်ပေးခြင်း - အလုပ်လုပ်ချိန်တွင် အရက်သေစာသောက်စားခြင်းကို တင်းကြပ်စွာ တားမြစ်ခြင်း - နှစ်ဦးနှစ်ဖက်ကောင်းမွန်စေရန် ဝန်ထမ်းများနှင့် ဆွေးနွေးခြင်း - အလုပ်ရှင်နှင့် အလုပ်သမားများအကြား မကောင်းမွန်သော ဆက်ဆံရေးကို ရှောင်ရှားခြင်း ဥပမာ-အလုပ်ပိုခိုင်းခြင်းနှင့် လုပ်ခလစာ နည်းခြင်း - ဒေသခံများနှင့် ကောင်းမွန်သော ဆက်ဆံရေး တည်ဆောက်ခြင်း
၉	ဖြစ်နိုင်ခြေရှိသော လုံခြုံရေးပြဿနာ	<ul style="list-style-type: none"> - နေနှင့် ညဘက်တွင် လုံလောက်သော လုံခြုံရေးဝန်ထမ်းများ ထားရှိခြင်း၊ လုံခြုံရေးကို စည်းကမ်းတင်းကြပ်စွာ ဆောင်ရွက်ခြင်း - စက်ရုံဝန်းအဝင်အထွက်များအားလုံးကို စစ်ဆေးခြင်း - အလွယ်တကူ ခွဲခြားနိုင်ရန် ဝန်ထမ်းများအားလုံးကို ID ကဒ်နှင့် တူညီဝတ်စုံများထောက်ပံ့ခြင်း - ဘိလပ်မြေစက်ရုံနှင့် တူးဖော်သည့် နေရာတို့အတွက် လုံခြုံရေးဝန်ထမ်းများ ထားရှိခြင်း - တန်ဖိုးကြီးပစ္စည်းများကို သော့ခတ်ထားခြင်း

(IV)စီမံကိန်းပိတ်သိမ်းခြင်း/ ပြန်လည်ထူထောင်ခြင်း ကာလအတွင်း

စဉ်	သက်ရောက်မှု	ဖြေလျော့နိုင်မည့်နည်းလမ်း
၁	ဖြစ်နိုင်ခြေရှိသော လုပ်ငန်းခွင်မတော်တဆမှု	<ul style="list-style-type: none"> - အကျိုးသက်ရောက်သော စီမံကိန်း ပိတ်သိမ်းခြင်းအတွင် အစီအစဉ်ရေးဆွဲခြင်း - အဆိုပါ လုပ်ငန်းကိုလုပ်ကိုင်ရန် ဖျက်သိမ်းသည့် ကန်ထရိုက်တာကို ငှားရမ်းခြင်း - ကောင်းမွန်၍ ဘေးအန္တရာယ်ကင်းရှင်းသော အလေ့အကျင့်များကို အမြဲတမ်းလေ့ကျင့်ခြင်း - အသုံးပြု၍မရသော ပစ္စည်းများကို စွန့်ပစ်ခြင်း၊ ပြန်လည် အသုံးပြု၍မရသော ပစ္စည်းများကိုပြန်လည်အသုံးပြုခြင်းနှင့် ရောင်းချခြင်း - မြေပြင်နှင့် မြေဆီလွှာကို ပြန်လည်ထိန်းသိမ်းခြင်း - မြေပြင်ကို ပြန်လည်ရှင်သန်ခြင်းအတွက် အပင်များစိုက်ပျိုးခြင်း - အမှိုက်များအားလုံးကို သေချာစွာဖယ်ရှား၍ နေရာကို သန့်ရှင်းသပ်ရပ်စွာ ထားခြင်း
၂	ဖြစ်နိုင်ခြေရှိသော ကြွင်းကျန်သက်ရောက်မှုများ	<ul style="list-style-type: none"> - အကျိုးသက်ရောက်သော ဖျက်သိမ်းခြင်းနှင့် ပြန်လည်ရှင်သန်ခြင်းအတွက် အစီအစဉ် ရေးဆွဲခြင်း - အကြွင်းအကျန်များရှိလျှင် ရှင်လင်းဖယ်ရှားခြင်း - လောင်စာဆီ သို့မဟုတ် ဓါတုဗေဒပစ္စည်းများကြောင့် မြေဆီလွှာ ညစ်ညမ်းမှုရှိလျှင် ဖယ်ရှားခြင်း - နောက်ဆုံးအကြိမ် လေ၊ ရေ၊ မြေဆီလွှာ ကို စမ်းသပ် တိုင်းတာခြင်း - မြေဆီလွှာတွင် ညစ်ညမ်းမှု ကျန်ရှိ မရှိ သိနိုင်ရန် မြေဆီလွှာ စမ်းသပ်တိုင်းတာခြင်း - ဖြစ်နိုင်လျှင် မြစ်ရေ ညစ်ညမ်းမှု ရှိ မရှိ စမ်းသပ်တိုင်း တာခြင်း - မြေဆီလွှာကို သဘာဝအတိုင်း ပြန်လည်ထိန်းသိမ်းခြင်း - စီမံကိန်းနေရာကိုပြန်လည်ရှင်သန်စေခြင်းနှင့် ပြန်လည်စိုက်ပျိုးခြင်း

အမျိုးမျိုးသော ဖြေလျော့နိုင်မည့်နည်းလမ်းများကို အခန်း (၆) တွင် အသေးစိတ်ဖော်ပြ ထားပါသည်။

ဖြစ်နိုင်ခြေရှိသော သဘာဝ ဘေးအန္တရာယ်

ပြင်းထန်သော မုန်တိုင်း၊ ကြီးမားသော ရေကြီးမှုများ၊ မြေငလျင်များ နှင့် ကြီးမားသော တောမီးများ ကဲ့သို့သော သဘာဝ ဘေးအန္တရာယ်များ ကြောင့် ဖြစ်နိုင်သော ကြီးမားသော သက်ရောက်မှုများကို မခန့်မှန်းနိုင်ပါ။

တွေ့ဆုံမေးမြန်းချက်များ အရ ၎င်းဧရိယာသည် ကမ်းရိုးတန်း နှင့် ဝေးပြီး တောင်တန်းများ ကာရံထားသောကြောင့် အကြမ်းဖက်မှု သည် မည်သည့် အခါမှ မဖြစ်ပေါ်ဖူးပါ။ စက်ရုံသည် ပင်လယ်ရေ မျက်နှာပြင်ထက် အမြင့်ပေ ၂၃၉မီတာ တွင် တည်ရှိပြီး ရေကြီးမှု ဖြစ်စေနိုင်သော မြစ်ကြီးများ မရှိပါ။ ထိုဒေသတွင် ရေကြီးမှု ဖြစ်စေနိုင်သည်အထိ မိုးသည်းထန်စွာရွာသွန်းခြင်း မရှိပါ။

လွန်ခဲ့သော ဆယ်စုနှစ် ၅ ခု အတွင်း ထိုဒေသတွင် ငလျင်ကြီးကြီးမားမား မရှိဖူးခဲ့သော်လည်း ငလျင်ငယ်များ ဖြစ်ပွားခဲ့ဖူးကြောင်း တွေ့ဆုံ မေးမြန်းခဲ့သူ အကြီး အကဲ များက ပြောကြားခဲ့သည်။ ပြင်းထန်သော ရာသီဥတုဖြစ်စဉ်၊ အလွန်အကျွံ မိုးရွာသွန်းခြင်း၊ မိုးခေါင်ခြင်း နှင့် ကြီးမားသော တောမီး လောင်ခြင်းများ မရှိဖူးကြောင်း သိရပါသည်။ (တွေ့ဆုံ မေးမြန်းခဲ့သူများမှ)

ထင်ရှားသော ဆက်စပ်သက်ရောက်မှုသည် သက်ရောက်မှုများပေါင်းစည်းခြင်းကြောင့် ဇီဝပိုင်းဆိုင်ရာ ဆက်စပ်သက်ရောက်မှု၊ သဘာဝ အရင်းအမြစ် (ထုံးကျောက်) များအပေါ် ဆက်စပ် သက်ရောက်မှု၊ စက်မှုဆိုင်ရာလုပ်ငန်းစဉ်များကြောင့် ဆက်စပ်သက်ရောက်မှုနှင့် ဖုန်မှုန့်နှင့် ပြာများ၏ စုပုံလာခြင်းများ ကို အခန်း-၆ တွင်ဖော်ပြထားပါသည်။

ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် (EMP)

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ် (EMP) သည် စီမံကိန်းလုပ်ဆောင်ခြင်းကြောင့် စီမံကိန်း ဧရိယာ၏ ပတ်ဝန်းကျင်အရည်အသွေး (လူထုအရည်အသွေးများလည်း) ပျက်ဆီးယိုယွင်းခြင်း မရှိကြောင်း သေချာစေရန် ရည်ရွယ်ပါသည်။ ပတ်ဝန်းကျင်ဆိုင်ရာ ပြဿနာများဖြစ်သော ရုပ်ပိုင်းဆိုင်ရာ ဇီဝပိုင်းဆိုင်ရာ၊ လူမှုစီးပွားရေးဆိုင်ရာ၊ ယဉ်ကျေးမှုဆိုင်ရာနှင့် မျက်စိပဒေသာဖြစ်သော ရှုခင်းရှုကွက် ပြဿနာများ အားလုံးအတွက် စီမံခန့်ခွဲမှုအစီအစဉ်များအား ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) တွင်လွှမ်းခြုံမိပါသည်။

ဆိုးကျိုးသက်ရောက်မှုများနှင့် နောက်ဆက်တွဲလျော့ပါးစေရေး နည်းလမ်းများသည် EMP၏ အဓိက အစိတ်အပိုင်းများ ဖြစ်ပါသည်။

ECD၏ "ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ် ၆၁၆/၂၀၁၅ အပိုဒ် ၆၃၊ အပိုဒ်ခွဲ ၆၊ ၆.၂.၁" တွင် ဖော်ပြထားသော စီမံကိန်း ကာလ တစ်ခုချင်းစီအတွက် ပြဿနာ တစ်ခုချင်း (သို့မဟုတ်) အစိတ်အပိုင်း တစ်ခုချင်းစီအတွက် အစီအစဉ်ခွဲများကို အခန်း ၈၊ ၈.၆ တွင် အသေးစိတ်ဖော်ပြထားပါသည်။

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အဖွဲ့

ထိရောက်သော ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် နှင့် စောင့်ကြပ်ကြည့်ရှုခြင်း အစီအစဉ် များကို လုပ်ဆောင်ရန် အတွက် EMP အဖွဲ့ (nucleus organization) ကို ဖွဲ့စည်းထားပါသည်။ ဤ EMP အဖွဲ့သည် စောင့်ကြပ်ကြည့်ရှုရေး ကော်မတီဝင်များလည်း ဖြစ်ပါသည်။ ရွာသား ၂ ဦးကို စောင့်ကြပ်ကြည့်ရှုရေး ကော်မတီတွင် ထည့်သွင်းပါမည်။

Young Investment Group Industry Co., Ltd သည် EMP အဖွဲ့ ကို အောက်ပါအတိုင်း ဖွဲ့စည်းထားပါသည်။

စဉ်	အမည်	ရာထူး	တာဝန်
၁။	ဦးညီညီထွန်း	စက်ရုံမှူး	EMP အဖွဲ့ ခေါင်းဆောင်
၂။	ဦးပြည်သိန်းကျော်	ဒုတိယ အထွေထွေ မန်နေဂျာ	EMP အဖွဲ့ဝင်
၃။	ဦးဇော်သိန်း	အင်ဂျင်နီယာ	EMP အဖွဲ့ဝင်
၄။	ဦးမောင်ထွေး	ပညာရှင်	EMP အဖွဲ့ဝင်
၅။	ဦးအောင်ကြည်	ပညာရှင်	EMP အဖွဲ့ဝင်
၆။	ဦးကံစ	နတ်ရေကန် ကျေးရွာ၏ ကျေးရွာအုပ်ချုပ်ရေး	EMP အဖွဲ့ဝင်
၇။	ဦးမောင်သန်း	ကန်တွင်း ကျေးရွာ၏ ကျေးရွာအုပ်ချုပ်ရေး	EMP အဖွဲ့ဝင်

နောက်ပိုင်းတွင် EMP အဖွဲ့ဝင် စာရင်းတွင် ဝန်ထမ်း ၁၀-၁၅ ဦးကို အလှည့်ကျ အဖွဲ့ဝင်များ အဖြစ် ထည့်ပါမည်။ လျော့ပါးစေရေးနည်းလမ်းများ၊ စောင့်ကြပ်ကြည့်ရှုခြင်း နှင့် အခြား EMP တာဝန်များ ပါဝင်သော ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် EMP ကို လုပ်ဆောင်ရန် အထူးတလည် လေ့ကျင့်ပေးထားပါမည်။

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အတွက် ရန်ပုံငွေ

စုစုပေါင်းဘတ်ဂျာ၏ ၀.၅ ရာခိုင်နှုန်း (အမေရိကန်ဒေါ်လာ ၁,၂၈၀,၅၃၆) ကို ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်အတွက် ရန်ပုံငွေ အဖြစ်မျှဝေထားပါသည်။

EMP အောက်ရှိလုပ်ငန်းစဉ် တစ်ခုချင်းစီ အတွက် ရန်ပုံငွေခွဲများကို အောက်ပါအတိုင်း ခွဲဝေထားပါသည် -

- EMP အဖွဲ့ ဖွဲ့စည်းရန်အတွက် ကုန်ကျစရိတ် ၂ ရာခိုင်နှုန်း (အမေရိကန်ဒေါ်လာ ၂၅,၆၁၀)
- EMP အတွက် အမှန်တကယ် ကုန်ကျမည့် ကုန်ကျစရိတ်
 - (က) ဖြေလျော့နိုင်မည့် နည်းလမ်း များအတွက် ၂၅ ရာခိုင်နှုန်း (အမေရိကန်ဒေါ်လာ ၃၂၀,၁၃၄)
 - (ခ) စောင့်ကြပ်ကြည့်ရှု လေ့လာခြင်း အတွက် ၂၅ ရာခိုင်နှုန်း (အမေရိကန်ဒေါ်လာ ၃၂၀,၁၃၄)
- ပစ္စည်းကိရိယာဝယ်ယူမှုအတွက် ကုန်ကျစရိတ် ၂၀ ရာခိုင်နှုန်း (အမေရိကန်ဒေါ်လာ ၂၅၆,၁၀၇)
- စွမ်းဆောင်ရည်မြှင့် သင်တန်း များအတွက် ကုန်ကျစရိတ် ၇ ရာခိုင်နှုန်း (အမေရိကန်ဒေါ်လာ ၈၉,၆၃၇)
- အရေးပေါ် အစီအစဉ်အတွက် ကုန်ကျစရိတ် ၁၀ ရာခိုင်နှုန်း (အမေရိကန်ဒေါ်လာ ၁၂၈,၀၅၃)
- အစီရင်ခံတင်ပြခြင်း လုပ်ငန်းအတွက် ကုန်ကျစရိတ် ၈ ရာခိုင်နှုန်း (အမေရိကန်ဒေါ်လာ ၁၀၂,၄၄၂)
- အထွေထွေ ကုန်ကျစရိတ် (EMPအဖွဲ့ဝင်ဖြစ်သော ရွာသား နှစ်ယောက်အတွက် အပါအဝင်) ၃ ရာခိုင်နှုန်း (အမေရိကန်ဒေါ်လာ ၃၈,၄၁၆)

အလုပ်သမား ကုန်ကျစရိတ်ကို အနည်းဆုံးဖြစ်စေရန် လုပ်ဆောင်ပါမည်။ EMP ကို လုပ်ဆောင်ခြင်းအတွက် ဝန်ထမ်းများသာ ပါဝင်ပါမည်။ ဝန်ထမ်းများကို ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ် EMP ကို လုပ်ဆောင်ရန် ဦးစွာ လေ့ကျင့်ပေးထားပါမည်။

အထက်တွင် ဖော်ပြထားသော ကုန်ကျစရိတ် တွက်ချက်ခြင်းသည် ယခု တည်ရှိနေသော တန်ဖိုးငွေဖြင့် တွက်ချက်ထားခြင်း ဖြစ်ပါသည်။ စီမံကိန်းသည် နှစ်ရှည်လများ (ဆယ်စုနှစ်တစ်ခုစာ) လုပ်ဆောင်မည်ဖြစ်သောကြောင့် ဈေးအတက်အကျနှင့် ငွေကြေးဖောင်းပွမှုသည် ရှောင်လွှဲ၍ မရနိုင်ပါ။ အနာဂတ်တွင် ရှောင်လွှဲ၍ မရနိုင်သော မည်သည့် အဖြစ်အတွက် မဆို လုပ်ဆောင်ရန်အတွက် အရေးပေါ်ပမာဏကို ပြင်ဆင်ထားရပါမည်။

ပတ်ဝန်းကျင်ဆိုင်ရာစောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းအစီအစဉ်

စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းသည် ပြီးပြည့်စုံသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် လုပ်ဆောင်ရန်အတွက် မရှိမဖြစ်အရေးပါပါသည်။ စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းသည် ပတ်ဝန်းကျင် ဆိုင်ရာနှင့် လူမှုရေးပြဿနာများ၊ ကောင်းမွန်သော စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းနှင့် သောချာသော ပြဿနာများအတွက် သီးသန့် စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းတို့အတွက် ပါဝင်ပါသည်။ (ပြီးပြည့်စုံသော စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်း အစီအစဉ်များကို အခန်း (၆၊ ၆.၁.၆) ဇယားဖြင့် ဖော်ပြထားပါသည်။ လက်တွေ့ဆန်သော ရုပ်ပိုင်းဆိုင်ရာ စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းမှာ အောက်ပါအတိုင်းဖြစ်သည်။)

အကြိုတည်ဆောက်ခြင်းကာလအတွင်း စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်း အနှစ်ချုပ်

စဉ်	သက်ရောက်မှု	စောင့်ကြပ်ကြည့်ရှုလေ့လာရမည့် ပါရာမီတာများ	စောင့်ကြပ် ကြည့်ရှုလေ့လာ ရမည့်နေရာ	အကြိမ်အရေ အတွက်	တာဝန်ရှိလူပုဂ္ဂိုလ်	ကုန်ကျစရိတ် (တစ်ကြိမ်)
၁။	လေအရည်အသွေး	- NO ₂ , SO ₂ , PM ₁₀ , PM _{2.5} , O ₃ , CO, VOC etc	- စက်ရုံ, Coordinate: N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0" - နတ်ရေကန်ကျေးရွာ Coordinate: N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5 - ကန်တွင်းကျေးရွာ Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"	တည်ဆောက်ရေး ကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌာနရမ်း	ကျပ် ၁,၇၀၀,၀၀၀
				တည်ဆောက်ရေး ကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌာနရမ်း	ကျပ် ၁,၇၀၀,၀၀၀
				တည်ဆောက်ရေး ကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌာနရမ်း	ကျပ် ၁,၇၀၀,၀၀၀
၂။	ရေအရည်အသွေး	- Total coliforms, Fecal coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron, P ^H , Sulphate, Total Dissolved Solids	- မြစ်ငယ်မြစ် Coordinate: N. Lat. 21° 46' 38.3"; E.Long. 96° 16' 30.3" - နတ်ရေကန်ကျေးရွာ Coordinate: N. Lat. 21° 44' 35.9"; E.Long. 96° 14' 52.0"	တည်ဆောက်ရေး ကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌာနရမ်း	ကျပ် ၂၀၀,၀၀၀
				တည်ဆောက်ရေး ကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌာနရမ်း	ကျပ် ၂၀၀,၀၀၀

			- ကန်တွင်းကျေးရွာ Coordinate: N. Lat. 21° 46' 53.1"; E. Long. 96° 14' 15.0"	တည်ဆောက်ရေး ကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌာနရမ်း	ကျပ် ၂၀၀,၀၀၀
၃၊	ဆူညံသံနှင့် တုန်ခါမှု	- dBA day time and night time	- စက်ရုံ, Coordinate: N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0"	တည်ဆောက်ရေး ကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌာနရမ်း	ကျပ် ၂၀၀,၀၀၀
			- နတ်ရေကန်ကျေးရွာ Coordinate: N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5	တည်ဆောက်ရေး ကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌာနရမ်း	ကျပ် ၂၀၀,၀၀၀
			- ကန်တွင်းကျေးရွာ - Coordinate: - N. Lat. 21° 46' 52.5"; E.Long. 96° 14' 15.0"	တည်ဆောက်ရေး ကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌာနရမ်း	ကျပ် ၂၀၀,၀၀၀
၄။	စွန့်ပစ်အစိုင်အခဲ	- တည်ဆောက်ရေးပစ္စည်းများကို ပုံမှန်စစ်ဆေးခြင်း - တစ်လလျှင် ထွက်ရှိသော လူသုံးစွန့်ပစ်ပစ္စည်းများကို စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်း	- စက်ရုံပန်းအတွင်း Coordinate: N. Lat. 21°44'51.48"; E. Long. 96°16'49.02"	- လစဉ်	EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထား သော ဝန်ထမ်း ၁၅ ဦး	အခမဲ့

၅။	မြေ	- မြေအရည်အသွေးကို စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်း ; texture, sand, silt, clay, pH, moisture, total N, P	- စက်ရုံဝန်းအတွင်း Coordinate: N. Lat. 21° 44' 44.7"; E. Long. 96° 16' 40.1"	တည်ဆောက်ရေး ကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌားရမ်း	ကျပ် ၅၀,၀၀၀
			- နတ်ရေကန်တွင်းကျေးရွာ Coordinate: N. Lat. 21° 44' 33.3"; E. Long. 96° 15' 01.8"	တည်ဆောက်ရေး ကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌားရမ်း	ကျပ် ၅၀,၀၀၀
			- ကန်တွင်းကျေးရွာ Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 14.1"	တည်ဆောက်ရေး ကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌားရမ်း	ကျပ် ၅၀,၀၀၀
	- တည်ဆောက်ရေးလုပ်ငန်းကို စောင့်ကြပ်ကြည့်ရှုခြင်း		- အပတ်စဉ်	EMP	အခမဲ့	
	- ဖြစ်နိုင်ခြေရှိသော မြေဆီလွှာ ပျက်စီးမှုကို စောင့်ကြပ်ကြည့်ရှုခြင်း		- လစဉ်	အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး		
	- လောင်စာဆီလျှံကျခြင်းကြောင့် မြေဆီလွှာ ညစ်ညမ်းမှုအား စောင့်ကြပ်ကြည့်ရှုခြင်း		- လစဉ်			

		<ul style="list-style-type: none"> - သန့်စင်ခန်းများအား ပုံမှန် စစ်ဆေးခြင်း - မိုးရာသီတွင် ဖြစ်နိုင်ခြေရှိသော မြေတိုက်စားခြင်းအား စောင့်ကြပ်ကြည့်ရှုခြင်း 		<ul style="list-style-type: none"> - လစဉ် - လစဉ် 		
၆။	ဘေးအန္တရာယ်ရှိပစ္စည်းများ	<ul style="list-style-type: none"> - လောင်စာဆီကိုင်တွယ်ခြင်း၊ သိုလှောင်ခြင်း၊ အသုံးပြုခြင်း အား စောင့်ကြပ်ကြည့်ရှုခြင်း - အသုံးပြုပြီးသော အင်ဂျင်စိုင်း တိုင်ကီများကို ပြန်လည် အသုံးပြုသူများအား ပေးခြင်းကို စောင့်ကြပ်ကြည့်ရှုခြင်း - အိုဟောင်းသော မီးသီးများ၊ ဘက်ထရီများ၊ ဇကာများစွန့်ပစ်ခြင်းအား စောင့်ကြပ်ကြည့်ရှုခြင်း 	<ul style="list-style-type: none"> - လောင်စာဆီသိုလှောင်ရုံ Coordinate: N. Lat. 21°45'5.44"; E. Long. 96°16'35.61" - အမှိုက်စွန့်ပစ်သည့်နေရာ Coordinate: N. Lat. 21°45'23.29"; E. Long. 96°16'18.18" 	<ul style="list-style-type: none"> - လစဉ် - လစဉ် 	<p>EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး</p> <p>EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး</p>	<p>အခမဲ့</p> <p>အခမဲ့</p>

၇။	လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး	<ul style="list-style-type: none"> - အလုပ်အခြေအနေနှင့်တည်ဆောက်ရေး နေရာများအား ပုံမှန် စောင့်ကြပ်ကြည့်ရှုခြင်း - ရှေးဦးသူနာပြုပုံးများ၊ ဆေးများကို စောင့်ကြပ်ကြည့်ရှုခြင်း - မတော်တဆထိခိုက်ဒဏ်ရာရသူများနှင့် တည်ဆောက်ရေးကာလတွင် နေမကောင်းသူများအတွက် မှတ်တမ်းစာအုပ်ထား၍ ပုံမှန် စောင့်ကြပ်ကြည့်ရှုခြင်း 	<p>- စက်ရုံဝန်းအတွင်း Coordinate: N. Lat. 21°45'17.60"; E. Long. 96°16'29.79"</p>	<ul style="list-style-type: none"> - အပတ်စဉ် - လစဉ် - လစဉ် 	<p>EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး</p> <p>EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး</p> <p>EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး</p>	<p>အခမဲ့</p> <p>အခမဲ့</p> <p>အခမဲ့</p>
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စီမံကိန်းလည်ပတ်ခြင်းကာလအတွင်းတွင် ရုပ်ပိုင်းဆိုင်ရာများအားစောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်း အစီအစဉ်အနှစ်ချုပ်

စဉ်	သက်ရောက်မှု	စောင့်ကြပ်ကြည့်ရှုလေ့လာရမည့် ပါရာမီတာများ	စောင့်ကြပ်ကြည့်ရှုလေ့လာရမည့်နေရာ	အကြိမ်အရေအတွက်	တာဝန်ရှိလူပုဂ္ဂိုလ်	ကုန်ကျစရိတ် (တစ်ကြိမ်)
၁။	လေအရည်အသွေး	- NO ₂ , SO ₂ , PM ₁₀ , PM _{2.5} , O ₃ , CO, VOC etc	- စက်ရုံ Coordinate: N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0" - နတ်ရေကန်ကျေးရွာ Coordinate: N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5" - ကန်တွင်းကျေးရွာ Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"	ခြောက်လ တစ်ကြိမ် ခြောက်လ တစ်ကြိမ် ခြောက်လ တစ်ကြိမ်	ပညာရှင်ဌာနရမ်း ပညာရှင်ဌာနရမ်း ပညာရှင်ဌာနရမ်း	ကျပ် ၁,၇၀၀,၀၀၀ ကျပ် ၁,၇၀၀,၀၀၀ ကျပ် ၁,၇၀၀,၀၀၀
၂။	ရေအရည်အသွေး/စွန့်ထုတ်ရေ	<u>ရေအရည်အသွေး</u> - Total coliforms, Fecal coliforms, Color, Turbidity, Arsenic, Lead, Nitrate,	- မြစ်ငယ်မြစ် Coordinate: N. Lat. 21° 46' 38.3"; E. Long. 96° 16' 30.3"	ခြောက်လ တစ်ကြိမ်	ပညာရှင်ဌာနရမ်း	ကျပ် ၂၀၀,၀၀၀

		Manganese, Chloride, Hardness, Iron, P ^H , Sulphate, Total Dissolved Solids	- နတ်ရေကန်ကျေးရွာ Coordinate: N.Lat. 21° 44' 35.9"; E.Long. 96° 14' 52.0"	ခြောက်လ တစ်ကြိမ်	ပညာရှင်ဌားရမ်း	ကျပ် ၂၀၀,၀၀၀
		<u>စွန့်ထုတ်ရေ</u>	- ကန်တွင်းကျေးရွာ Coordinate: N. Lat. 21° 46' 53.1"; E. Long. 96° 14' 15.0"	ခြောက်လ တစ်ကြိမ်	ပညာရှင်ဌားရမ်း	ကျပ် ၂၀၀,၀၀၀
		- pH, temperature increase, total suspended solid	- စွန့်ထုတ်နေရာ Coordinate: N. Lat. 21° 44' 56.73"; E.Long. 96° 16' 42.43"	ခြောက်လ တစ်ကြိမ်	ပညာရှင်ဌားရမ်း	ကျပ် ၅၀,၀၀၀
၃။	ဆူညံသံနှင့်တုန်ခါမှု	- dBA day time and night time	- စက်ရုံ Coordinate: N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0"	တည်ဆောက် ရေးကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌားရမ်း	ကျပ် ၂၀၀,၀၀၀
			- နတ်ရေကန်ကျေးရွာ Coordinate: N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5"	တည်ဆောက် ရေးကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌားရမ်း	ကျပ် ၂၀၀,၀၀၀

			- ကန်တွင်းကျေးရွာ - Coordinate: N.Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"	တည်ဆောက် ရေးကာလတွင် တစ်ကြိမ်	ပညာရှင်ဌာနရမ်း	ကျပ် ၂၀၀,၀၀၀
၄။	စွန့်ပစ်အစိုင်အခဲ	- ပုံမှန်စွန့်ပစ်အစိုင်အခဲများကို မျက်မြင်ဖြင့် စစ်ဆေးခြင်း - လစဉ်ထွက်ရှိသော စွန့်ပစ် အစိုင်အခဲ (စက်မှုနှင့် လူသုံး) တို့ကို မှတ်တမ်းစာအုပ် အား စောင့်ကြပ်ကြည့်ရှုခြင်း	- မှတ်တမ်းစာအုပ်နှင့် အမှိုက်စွန့်ပစ်သည့်နေ ရာ Coordinate: N. Lat. 21°44'51.48"; E. Long. 96°16'49.02"	- အပတ်စဉ်၊ လစဉ်	EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး	အခမဲ့
၅။	မြေ	- ဖြစ်နိုင်ခြေရှိသော တိုက်စားခြင်း (မိုးရာသီ)နှင့် လောင်စာဆီလျှံ ကျခြင်းကြောင့် မြေဆီလွှာ ညစ် ညမ်းခြင်းကို စောင့်ကြပ်ကြည့် ရှုခြင်း - သိုလှောင်ရုံနှင့် ဆီသိုလှောင် ကန်နေရာကို ပုံမှန် စောင့်ကြပ် ကြည့်ရှုခြင်း - မြေအရည်အသွေး စောင့်ကြပ် ကြည့်ရှုခြင်း; texture, sand, silt, clay, pH, moisture,	- စက်ရုံဝန်းအတွင်း - သိုလှောင်ရုံနှင့် ဆီသို လှောင်ကန် Coordinate: N. Lat. 21°45'5.44"; E. Long. 96°16'35.61" - စက်ရုံဝန်းအတွင်း Coordinate: N. Lat. 21° 44' 44.7"; E. Long. 96° 16' 40.1"	- လစဉ် - လစဉ် ခြောက်လ တစ်ကြိမ်	EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး ပညာရှင်ဌာနရမ်း	အခမဲ့ ကျပ် ၅၀,၀၀၀

		total N, P	- at Nat Yay Kan village, Coordinate: N. Lat. 21° 44' 33.3"; E. Long. 96° 15' 01.8" - ကန်တွင်းကျေးရွာ Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 14.1"	ခြောက်လ တစ်ကြိမ် ခြောက်လ တစ်ကြိမ်	ပညာရှင်ဌားရမ်း ပညာရှင်ဌားရမ်း	ကျပ် ၅၀,၀၀၀ ကျပ် ၅၀,၀၀၀
၆။	ဘေးအန္တရာယ်ရှိစွန့်ပစ် ပစ္စည်း	- လောင်စာဆီကိုင်တွယ်ခြင်း၊ သိုလှောင်ခြင်း၊ အသုံးပြုခြင်း အားပုံမှန် စောင့်ကြပ်ကြည့်ရှုခြင်း - အသုံးပြုပြီးသော အင်ဂျင်ပိုင် တိုင်ကီများကိုပြန်လည်အသုံးပြု သူများအား ပေးခြင်းကို စောင့်ကြပ် ကြည့်ရှုခြင်း - အိုဟောင်းသော မီးသီးများ၊ ဘက်ထရီများ၊ ဇကာများစွန့်ပစ် ခြင်းအား စောင့်ကြပ်ကြည့် ရှုခြင်း	- လောင်စာဆီသိုလှောင် ရုံ၊ Coordinate: N. Lat. 21°45'5.44"; E. Long. 96°16'35.61" - အမှိုက်ပုံးများနှင့် အမှိုက်ပုံ Coordinate: N. Lat. 21°45'23.29"; E. Long. 96°16'18.18"	အပတ်စဉ်/လ စဉ် အပတ်စဉ်/လ စဉ်	EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး	အခမဲ့ အခမဲ့

၇။	လုပ်ငန်းခွင်ကျန်းမာရေးနှင့်ဘေးအန္တရာယ်ကင်းရှင်းရေး	<ul style="list-style-type: none"> - အလုပ်ခွင်နေရာနှင့် အလုပ်အခြေအနေကို ပုံမှန်စစ်ဆေးခြင်း - စက်ရုံဆေးပေးခန်းကို ပုံမှန်စစ်ဆေးခြင်း၊ - မတော်တဆထိခိုက်ဒဏ်ရာရသူများနှင့် တည်ဆောက်ရေးကာလတွင် နေမကောင်းသူများအတွက် မှတ်တမ်းစာအုပ်ထား၍ ပုံမှန် စောင့်ကြပ်ကြည့်ရှုခြင်း - ဆေးများထားရှိမှုကို စောင့်ကြပ်ကြည့်ရှုခြင်း - ရှေးဦးသူနာပြုသင်တန်းနှင့် မီးသတ်သင်တန်းကို စောင့်ကြပ်ကြည့်ရှုခြင်း - OHS သင်တန်းပေးခြင်းအား စောင့်ကြပ်ကြည့်ရှုခြင်း 	<ul style="list-style-type: none"> - အလုပ်ခွင် Coordinate: N. Lat. 21°45'17.60"; E. Long. 96°16'29.79" - စက်ရုံဆေးပေးခန်း Coordinate: N. Lat.21°44'49.46"; E. Long. 96°16'30.95" - သင်တန်းပေးချိန်တွင် စက်ရုံဝန်းအတွင်း - သင်တန်းပေးသည့် နေရာ 	<ul style="list-style-type: none"> - လစဉ် - လစဉ် - သင်တန်းချိန် - သင်တန်းချိန် 	<ul style="list-style-type: none"> EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး EMP အဖွဲ့ဝင်များနှင့် လေ့ကျင့်ထားသော ဝန်ထမ်း ၁၅ ဦး ဖိတ်ကြားထားသော သင်တန်းဆရာ ဖိတ်ကြားထားသော သင်တန်းဆရာ 	<ul style="list-style-type: none"> အခမဲ့ အခမဲ့ - အခမဲ့ - ကျပ် ၂,၀၀၀,၀၀၀ သင်တန်း ၂ ခု အတွက် ဂါရုကြေး - ကျပ် ၃၀၀,၀၀၀ သင်တန်းဆရာ အတွက် လက်ဆောင်
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လူထုတွေ့ဆုံဆွေးနွေးခြင်း

- ကုမ္ပဏီသည် လူထုတွေ့ဆုံပွဲများကို ဒေသခံများနှင့် အချိန်နှင့်အမျှ ပြုလုပ်ခဲ့ပါသည်။
- ပထမလူထုတွေ့ဆုံဆွေးနွေးပွဲကို ကုမ္ပဏီမှ တာဝန်ရှိသူများနှင့် ဒေသခံများ ဘုန်းကြီးကျောင်းတွင် ၂၀-၃-၂၀၁၄ တွင် ကျင်းပခဲ့ပါသည်။
- ဒုတိယလူထုတွေ့ဆုံဆွေးနွေးပွဲကို ၂၀-၃-၂၀၁၇ တွင် ကျင်းပခဲ့ပါသည်။
- ကုမ္ပဏီမှ တာဝန်ရှိသူများ၊ လွှတ်တော်အမတ်များ (၃) ဦးနှင့် အခြားအစိုးရဌာနမှ အရာရှိများအကြား ၂၈-၃-၂၀၁၇ တွင် ကျင်းပခဲ့ပါသည်။
- လွှတ်တော်အမတ်များနှင့် အစိုးရအရာရှိများ မျက်မြင်စစ်ဆေးခြင်းကို စီမံကိန်းနေရာသို့ ၁-၄-၂၀၁၇ တွင်လာရောက်စစ်ဆေးခဲ့ပါသည်။
- နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်း လေ့လာချိန်အတွင်းတွင် လူထုတွေ့ဆုံပွဲတစ်ခုကို ၂၀-၇-၂၀၁၇ တွင် ပြုလုပ်ခဲ့ပါသည်။
- ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းလေ့လာချိန်အတွင်းတွင် နတ်ရေကန်ကျေးရွာ ၁၈-၁-၂၀၂၄ (၁၃:၀၀-၁၄:၀၀)နှင့် ကန်တွင်းကျေးရွာ ၁၈-၁-၂၀၂၄ (၁၅:၀၀-၁၆:၀၀) တို့တွင် လူထုတွေ့ဆုံပွဲ ၂ ပွဲကျင်းပခဲ့ပါသည်။

လူထုတွေ့ဆုံဆွေးနွေးခြင်း (၂၀-၇-၂၀၁၇နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်းလေ့လာချိန်အတွင်းတွင်)

အစည်းအဝေးတွင် ဦးပေါ်ဆွေမှ လူငယ်တွေ့အလုပ်အကိုင်ဦးစားပေးခန့်ထားပေးရန် ပြောကြားခဲ့ပါသည်။

ဦးသောင်ရွှေမှ မိုးတွင်းတွင် ရေမြုပ်သော နေရာတွင် တံတားတည်ဆောက်ပေးရန် ပြောကြားခဲ့ပါသည်။

ကုမ္ပဏီမှ တာဝန်ရှိသူသည် ကုမ္ပဏီ၏ သက်ဆိုင်ရာသို့တင်ပြပေး၍ အဆိုပြုစီမံကိန်းစတင်လျှင် ပြုလုပ်ပေးပါမည်ဟု ပြန်လည်ဖြေကြားခဲ့ပါသည်။

လူထုတွေ့ဆုံဆွေးနွေးခြင်း (၁၈-၁-၂၀၂၄၊ နတ်ရေကန်ကျေးရွာ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း
လေ့လာချိန် အတွင်းတွင်)

ဒေသခံတစ်ဦးမှ ဤစီမံကိန်းကြောင့် လူအများစု အလုပ်အကိုင်ရရှိရန် သူ၏မျှော်လင့်ချက်ကို ပြောကြားခဲ့ပါသည်။

အခြားဒေသခံတစ်ဦးမှ ကျွန်တော်တို့အများစုမှာ ရာသီပေါ်အလုပ်သမားများဖြစ်ကြသည်။ စီမံကိန်းမှ အမြဲတမ်းဝန်ထမ်းအလုပ်ကို ရရှိမည်ဟု ပြောကြားခဲ့ပါသည်။

အခြားဒေသခံမှ ဒေသအား ပိုမိုထောက်ပံ့မှုပေးစေချင်ပါသည်ဟု ပြောကြားခဲ့ပါသည်။

ကုမ္ပဏီ၏တာဝန်ရှိသူ ဦးညီညီထွန်းမှ အမြင်သဘောထားအားလုံးကို မှတ်တမ်းထား၍ အကောင်းဆုံးဆောင်ရွက်ပေးပါမည်ဟု ပြန်လည်ဖြေကြားခဲ့ပါသည်။

လူထုတွေ့ဆုံဆွေးနွေးခြင်း (၁၈-၁-၂၀၂၄၊ ကန်တွင်းကျေးရွာ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း
လေ့လာချိန်အတွင်းတွင်)

ဒေသခံတစ်ဦးမှ အလုပ်အကိုင်များပိုမိုရရှိလာမည်ဟု ပြောကြားခဲ့ပါသည်။

အခြားဒေသခံဖြစ်သော ဦးဝင်းအောင်မှ ကုမ္ပဏီမှ ကျေးရွာကျောင်းပြုပြင်ရန်အတွက် အလှူငွေလှူစေချင်ပါသည်ဟု ပြောကြားခဲ့ပါသည်။

ကုမ္ပဏီ၏တာဝန်ရှိသူ ဦးညီညီထွန်းမှ အမြင်သဘောထားအားလုံးကို မှတ်တမ်းထား၍ အကောင်းဆုံးဆောင်ရွက်ပေးပါမည်ဟု ပြန်လည်ဖြေကြားခဲ့ပါသည်။

မှတ်ချက်-စီမံကိန်းသည်မစတင်ရသေးပေ။ အကြိုတည်ဆောက်ရေးကာလသာရှိသေးသည်။

အစည်းအဝေးမှတ်တမ်းအားလုံးကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာထဲတွင် ဖော်ပြပါမည်။

နောက်ပြုလုပ်မည့် လူထုတွေ့ဆုံပွဲများနှင့် GRM အစီအစဉ်တို့ကို အစီရင်ခံစာထဲတွင်လည်း ရှင်းပြထားပါသည်။

နိဂုံးချုပ်

စီမံကိန်းသည် အမေရိကန်ဒေါ်လာ ၂၅၆.၁၀၇၂ သန်း တိုက်ရိုက်ရင်းနှီးမြှုပ်နှံမှုကြောင့် တိုင်းပြည်၏ GDP တိုးလာခြင်းနှင့် အခွန်ရရှိမှု မြင့်တက်လာနိုင် ပါသည်။

၎င်းသည် ရာနှင့်ချီသော ဒေသခံများကို အလုပ်အကိုင် ရရှိသည့် အခွင့်အလမ်းများကို ယူဆောင်လာပါသည်။ နည်းဥပဒေများ၊ စည်းမျဉ်းများနှင့် မဖြစ်မနေ ဆောင်ရွက်ရမည့် လိုအပ်ချက်များနှင့် ဖြေလျော့နိုင်မည့် နည်းလမ်းများအားလုံးကို သေချာလိုက်နာလျှင် စီးပွားရေးအလားအလာနှင့် ပတ်ဝန်းကျင်ဆိုင်ရာ စဉ်ဆက်မပြတ်စေရန် ထိန်းသိမ်းထားနိုင် ပါသည်။

စီမံကိန်းအဆိုပြုတင်ပြသူသည် စီမံကိန်းအား ပတ်ဝန်းကျင်အပေါ် ကြီးမားသော သက်ရောက်မှုမရှိပဲ အောင်မြင်စွာလုပ်ကိုင်နိုင်မည်ဟု ယုံကြည်ပါသည်။

1. EXECUTIVE SUMMARY

This is the Environmental Impact Assessment (EIA) report for the construction and operation of a cement plant (capacity 5000 tons/day 2 lines) at Mya Leik Taung Ara, near Nat Yay-kan village, Kyaukse Township, Mandalay Region by the project proponent, Young Investment Group Industry Co., Ltd.

Young Investment Group Industry Co., Ltd was registered as a private company limited by shares in January, 2011 and renewed on 1-7-2013. (Document: No. 2021/of 2010-2011, Dated: 1-7-2013, Certificate of Incorporation Under Myanmar Company Law.) The registration number is 109000574, Dated: 13-1-2011. The company has also obtained the permit from MIC (Document: 817/2011, Dated: 8-11-2011). (Amended permit-29-11-2019)

Young Investment Group Industry Co., Ltd has contracted the consultant firm, Myanmar Environment Sustainable Conservation Co., Ltd (MESCC) to conduct Environmental Impact Assessment (EIA) for the proposed project. As a preliminary component of EIA this scoping survey and rapid assessment of the site was conducted on 18-3-2017 to 24-3-2017.

The said scoping report was approved by the authority, ECD. (Document: EIA-1/8/approved (SR) 2022); dated 11-10-2022).

This is the follow-up EIA study after the scoping report. As mentioned above, the company was registered as a private company limited by shares in January, 2011 and renewed on 1-7-2013.

About the project proponent

Name of the project proponent	: Young Investment Group Industry Co., Ltd
Address	: No. 886/888, 9 Mile, Pyay Road, 5 Ward, Mayangone Township, Yangon Region
Contact person	: Daw Hla Myat Thu
Phone	: 09 457741383
E-mail	: hlamyatthu@yigmm.com
Location of project site	: Mya Leik Taung Area, near Nat Yay Kan Village, Thayet Pin Village Tract, Sintgaing Township, Mandalay Region

The managing director is U Thiha Aung and there are 3 directors, Daw Nang Saw Htwe, Daw Khin Myint and Daw Hla Myat Thu.

The company is 100% owned by nationals.

Particulars of executive and administrative body

Name	Nationality & National Registration Card No.	Designation
U Thiha Aung	Myanmar 13/La Ya Na (N)083483	Managing Director
Daw Nang Saw Htwe	Myanmar 1/Ma Ka Ta (N)049490	Director
Daw Khin Myint	Myanmar 13/La Ya Na (N)093409	Director
Daw Hla Myat Thu	Myanmar 12/Ba Ha Na (N)081655	Director

About the consultant firm

MESC is a consultant firm officially registered in 2014 as a limited company (a consultant/service company) at the Ministry of National Planning and Economic Development. Document: YaKa-8(Ga) 001/2014(004720), dated: 6th June, 2014. Registration No. 830/2014-2015, (20-5-2014).

The Transitional Registration/License No. of the consultant firm, MESC is No. 0003, ECD, Dated 1st July 2017.

Contact Address : Room no. (B -5), Building no.67/69, Parami Road, 16 Ward, Hlaing Township, Yangon

Contact person : Myint Kyaw Thura
95 9 420105071

Contact number : 95 9 73044903

E-mail : myanmar.esc@gmail.com

Members of MESC who are IEE/EIA appraisers, or IEE/EIA practitioners or who are involved in this IEE/EIA project are as follows: -

Name	Nationality & National Registration Card No.	Registration /license No. by ECD	Responsibilities
U Myint Kyaw Thura M.Sc (Zoology)	Myanmar 12/Da Ga Ta (N)028349	0006	Ecology and Biodiversity, Social studies and analysis, General environmental management
U Saw Han Shein B.Sc (Botany) M.Sc (Marine Biology)	Myanmar 10/Ma La Ma(N)008173	0007	Ecology and Biodiversity, Risk assessment and risk management, Prevention, Controlling, Monitoring and Impact Prediction of Water Pollution;
U Tin Tun Aung B.Sc (Engineering)	Myanmar 12/U Ka Ma (N)172111	0009	Monitoring of Air Pollution,
U Than Soe Oo M.Sc (Forestry)	Myanmar 9/Ma Na Ma (N) 050808	00011	Land Use, Natural resource management (Forestry)
U Oakka Kyaw Thu B.Sc (Geology)	Myanmar 7/Ya Ta Ya (N) 090371	00012	Geological Survey, Soil conservation
Daw Thin Thin Yee B.Sc (Chemistry)	Myanmar 12/Tha Ga Ka (N)039292	00013	Prevention and control of Air Pollution
U Thura Ko B.A (History)	Myanmar 12/Ka Ma Na (N) 124824	00277	Archeology and Cultural Heritage, Noise and vibration, Social studies and analysis
Daw Khin Thidar La Wun	Myanmar 12/Sa Kha Na (N) 069879	part time	Weather and air quality analysis and forecasting, Hydrology, Ground water and underground water management, Solid waste and hazardous waste management

MESC has also part time members working as free lances.

The firm is not in a position to employ all its part time members on a permanent basis.

These are botanists, zoologists, ornithologists, ecologists, aquatic ecologists, social scientists, engineers and geologists working with this firm.

Corporate environment policy and legal frame work

The corporate environmental policy of Young Investment Group Industry Co., Ltd is to do a cement business that will be environmentally sound as far as possible. To protect and conserve the environment as practical as possible while manufacturing and producing cement.

The company will endeavour to:

- Implement the project in an environmentally and socially responsible manner and to comply with laws and regulations
- Prevent pollution of surrounding area; monitoring and adopting suitable measures for environment protection
- Implement EIA/EMP effectively to mitigate pollution of water, land, air, noise and dust and proper disposal of waste
- Conserve natural resources and energy as far as possible
- Create environmental awareness among employees and local community through education and training, and

The company has followed the standards for environmental and social sustainability and has taken Corporate Social Responsibility (CSR) activities and will continue to carry out CSR activities.

The company has implemented Environmental Management Plan (EMP) and Monitoring Plan (MP) for this project. A small organization EMP cell is formed for the effective implementation of EMP and MP. The manager of the factory is the EMP cell leader, while other staffs are EMP cell members. There will be alternate members or additional members to cope with EMP implementation.

Brief description of the project

The proposed 5,000 tons/day 2 lines cement factory is situated near Nat Yay Kan Village, Thayet-pin Village Tract, Kyaukse Township, and Mandalay Region. The coordinates at the factory compound are N. Lat. 21°45'18.57" and E. Long 96°16'26.07"; elevation 239 m asl.

The proposed site has an area of 513.16 acres and is 1.8 miles east of Nat Yay Kan Village.

About 2.5 miles away from the center of the project site in the east is the Myitnge River which flows in a generally southeast to northwest direction in this area. The northern border of project site compound is close to Myitnge River. The Mya Leik Taung Mountain where limestone will be extracted is also about 2 miles in the northwest. Kandwin Village is about 3 miles in the northwest.

The site is in a flat and undulating terrain with low mountains and hills.

The proposed cement project has a budget of US\$ 256.1072 million. The Construction Phase will be 2 years and the Operation Phase will be 25 years (extendable 10 years twice). The Decommissioning Phase will be 2 years.

During the Operation Phase 450 workers including 100 foreigners when 2 lines are in full operation.

The technology is "dry process" and the daily production is 10,000 tons/day of Portland cement from 2 lines of factories.

The site has access to gridline electricity from Shwe Sar Yan substation; but for reliable electricity the company has plan for building 2 x 20MW coal-fire power plants.

Water will be sourced from Myitnge River.

The fuels are diesel, petroleum (gasoline), engine oil etc.

The raw materials are limestone, iron ore, sand, clay, gypsum and coal. Limestone will be obtained from Mya Leik Taung mountain sand and clay will be procured from Sintgaing Township; iron ore will be from Pyin Oo Lwin Township, and gypsum will be from Thibaw Township. Low quality coal will come from Mawlaik Township while quality coal will be imported from Indonesia and Australia.

Technology, production processes in brief

The 7 major steps in the production of cement:

- 1) Mining – mining and excavation of the main raw materials, limestone
- 2) Crushing and pre-homogenization of raw materials limestone, iron ore, sand and clay
- 3) milling (pulverization), homogenization and temporary storage of raw materials, limestone, iron ore, sand and clay
- 4) pre-heating and clinkerization (coal burner in the form of powder coal)
- 5) clinker cooling and temporary storage
- 6) clinker grinding and gypsum addition
- 7) cement storage, packing and distribution

Project development and implementation schedule

The tentative schedule:

Preconstruction Phase : 1 year (estimated)

Construction Phase : 2 years

Operation Phase : 25 years (extendable 10 years, twice)

Decommissioning/Rehabilitation Phase : 2 years

(Actually the project is at the moment still only in the pre construction phase)

The project alternative

The alternatives to be considered are site/location alternative, technology alternative, the energy alternative, supply alternative, activities alternative and the "no go" or "no project" alternative.

The cement factory project is site specific, that is, it has to be close to a limestone mountain for main logistics purpose. Mya Leik Taung is an ideal area for the project.

As regards technology alternative the "dry process technology" is selected rather than the "wet process" technology. The former has many advantages over the later.

As an energy alternative the company will build 2 x 20MW coal-fired power plants.

To conserve energy the company has a plan for building a 9MW waste heat power generation system.

As for supply alternative the company will adhere to the principle of conservation of water, fuel and energy rather than follow the old conventional consumption system.

Regarding activities the company will educate and train the workers for good working practice, good safety practice, and good environmental practice rather than follow the traditional/conventional way in performing their jobs.

The "no project alternative" will not be considered. The no project alternative cannot contribute anything to the development of the area and region, and hence the nation. The area will remain an unproductive arid land area while the valuable limestone resources will remain untapped.

The surrounding environment

Chapter-4 is about the description of the surrounding environment. A rapid survey was conducted during this scoping survey. A comprehensive survey is conducted in the EIA study. The physical, biological, socio-economic, cultural and visual components of the surrounding environment were studied in details during EIA field study.

The designated study limit is 2 miles radius (12.6 sq. miles). This is because the factory is a modern factory that focuses on doing environmental friendly business. The factory will have 58 bag filters to mitigate dust emissions (both stationary emission from the stack and fugitive emission elsewhere). Constant high temperature and complete combustion will be applied. All these mitigate PM, SO₂ and NO_x. Unlike the older type of cement factories that emit billows and billows of dark smoke and have high impact, the impact here will be relatively low due to mitigation measures to be taken. The impact can be seen and felt within 2 miles radius.

This is for pragmatic purpose and workable for details studies within 12.6 square miles.

The whole area is within the scrub land Dry Zone Region of the country. The area comprises both flat terrain and undulating terrain with low mountains/hill ranges that generally run from a north to south direction.

In the east, 2.5 miles away from the center of the project site is the Myitnge River where water will be sourced. In the adjacent northwest, 1.25 miles is the Mya Leik Taung mountain where limestone will be extracted.

Two and half miles in the southwest is the Nat Yay Kan Village, while 3 miles in the northwest is the Kandwin Village.

The studies on the physical, biological, socio-economic, cultural and visual components were conducted and baseline data collected.

Meteorological data were collected from Kyaukse Meteorological Department. The maximum rainfall was 45.02 inches (2015).

Other physical characteristics: e.g. topography, geology, ambient air, noise, vibration and water environment are also studied and recorded. The values of emission and effluent are compared with those NEQ (emission and effluent) guideline values prescribed by ECD, MONREC. On the whole the values are lower than ECD guideline values.

As regards biodiversity studies – 97 species of flora, 95 species of avian fauna, 13 species of herpetofauna, 7 species of mammalian fauna and 22 species of fish were identified.

A rapid socio-economic study on Nat Yay Kan village and Kandwin village was conducted. The Nat Yay Kan and Kandwin village has a population of 1365 and 950 respectively. Hundred percent are Barmars and Buddhists.

Agriculture is not developed as the land is not productive. The main crops for both villages are rice, cotton, sesame, ground nut and sunflower. Daily wages range from Ks 4,000 to Ks 6,000; unemployment rate is quite high.

Both villages are accessible by motor road; all households have access to gridline electricity.

Nat Yay Kan village has one Affiliated High School with 296 students and 10 teachers while Kandwin village has one Middle School with 173 students and 6 teachers. Nat Yay Kan village has one village clinic and the nearest hospital is at Sintgaing Town, 11 miles away.

Most households source water from tube well at an average depth of 80-100 feet.

Most households use electricity and wood for cooking.

Nat Yay Kan village has one Buddhist monastery with 10 monks while Kandwin village has one Buddhist monastery with one monk. Even though all are Bamar Buddhists some still worship/prostitute the "Nat" spirits.

Detailed study on the socio-economic component of both is reported later in **Chapter 5**.

Impact and risks assessment and mitigation measures

The impacts/potentials impacts identified and assessed during the Preconstruction Phase, Construction Phase, Operation Phase, and Decommissioning/Rehabilitation Phase are listed below:

Subsequent mitigation measures are summarized below in tabulated forms. (These are described in technical details later in **Chapter 6**).

(I) During the Preconstruction Phase

Sr. No.	Impact/potential impact	Mitigation
1	Potential polarization of locals into pro-project and anti-project groups due to instigation by activists and/or radical environmentalists.	<ul style="list-style-type: none"> - no quick fix measures for this potential social impact - build good relation with the local community - implement CSR programme
2	The potential hiking of price of land and property	<ul style="list-style-type: none"> - not mitigable (no remedy for inflation) - staff of the company must not get involve in land price speculation

(II) During the Construction Phase

Sr. No.	Impact	Mitigation
1.	Impact on air environment	<ul style="list-style-type: none"> - Comply with ECD's NEQ emission guidelines - Plan in the Pre-Construction Phase for the procurement of equipment, vehicles that emit less smoke (to be certified for emission compliance) - Keep equipment and vehicles well-maintained, well-operated and well-lubricated to reduce smoke emission - Use machinery and vehicle with low emission rate; use fuel with low sulphur content - Avoid open burning of debris - Spray water for suppression of dust - Restrict vehicular movement; maintain road clear of mud and dirt - Provide PPE to workers who are exposed to smoke or dust for long period

2.	Noise and vibration	<ul style="list-style-type: none"> - Plan in the Preconstruction Phase for procurement of equipment, and vehicles that emit lower noise level - Comply with ECD's NEQE guidelines for noise level - Avoid construction work at night - Provide PPE to workers exposed to prolonged high noise level - Manage vibration of machine, equipment and vehicle; - Limit the speed of vehicles
3.	Impact on land environment	<ul style="list-style-type: none"> - During earth work the top soil should be separately stockpiled from other sub-surface soil or rocks - Top soil should not be used for maintaining access road or for building - During rehabilitation top soil should be effectively used to promote the natural growth of vegetation; - Avoid contamination of soil by all means. - Oil spilled should be cleaned up immediately; do not wash down with water but used absorbents or saw dust - Vehicles and machinery should be adequately maintained to prevent fuel leaks resulting to soil contamination - All waste materials (earth, rocks) resulting from construction work should be disposed of at a designated spot - Solid waste and liquid waste from field camp should be also disposed of at designated spot - Educate and train the workers for good house keeping practice; do not litter; do not pollute the area - Avoid the destruction of soil profile and soil structure as far as possible
4.	Impact on water; environment	<ul style="list-style-type: none"> - Avoid water bodies as far as possible when constructing or upgrading area roads - Storage of fuel oil as well as used fuel oil should be done in a designated bunded side until removal - Maintain vehicles and machinery adequately to prevent spillages resulting in surface water contamination - When handling fuel oil avoid accidental spillages into the surface water; should spillages occur implement appropriate clean up immediately - Avoid disposing of waste (both liquid and solid) into water bodies - Top soil should be allowed to naturally vegetate in order to stabilize soil particles and thus preventing erosion and limiting siltation to surface water

5.	Impact of waste	<ul style="list-style-type: none"> - Avoid open burning of debris - Educate workers for good housekeeping; do not litter - At the end of Construction Phase put up construction spoils, left over materials for sale - Avoid spillage of fuel oil-; should spill occur immediately clean by means of absorbent or saw dust (do not wash down with water) - Plan for management of temporary latrines for worker camps; regularly spread soil or ash into the pit; backfill all latrines after completion of Construction Phase
6.	Impact on biodiversity	<ul style="list-style-type: none"> - Do not clear vegetation more than necessary for the construction of access road; restrict the removal of vegetation; avoid as far as possible the cutting of big trees - Control and minimize dust and eventual disposition of dust on leaves on plants restricting photosynthesis - Restrict the collection of fire wood; do not cut trees for fuel wood but collect fuel wood from fallen trees, dried logs or branches or use charcoal for cooking - Avoid open burning of debris - Educate workers for fire awareness and protection; prohibit the discard of burning cigarette butts carelessly; get rid of all debris that can cause fire - Promote environment awareness to workers - Restrict vehicular movement to the access road to prevent habitat disturbance of birds and animals - Prohibit the hunting and/or trapping of wild animals big and small including rodents, birds, reptiles and amphibians by workers
7.	Occupational health and safety issue	<ul style="list-style-type: none"> - Organize and provide first aid training and fire prevention and fighting training - Provide adequate First Aid Kit, and Fire extinguishers; keep water tanks always full for fire-fighting - Phone numbers and address of Red Cross Society, Ambulance service, Fire Brigade, Police station, Hospital etc. must be displayed so that everyone could easily see - Create safety condition for work places - Educate and train workers for good working practice, good engineering practice, good safety practice and good housekeeping practice - Plan and implement prompt admission of seriously sicked and injured worker to nearest hospital. - Prevent and avoid accidents and try to achieve zero accident at work places - Educate and train them for health education and hygiene

8.	Potential social issue	<ul style="list-style-type: none"> - Educate and discipline the workers; apply punitive measures such as suspension of the wrongdoer - Educate the workers on appropriate behaviour in the local community pertaining to local customs and etiquette for healthy community interaction - Strictly prohibit the drinking of alcohol in the site - Apply punitive measures for the wrong doer - Maintain the good on-going relation between the company and the locals - Conduct public consultation so that the locals will have a positive perception on the project. - Plan for the management of STD - Separate housing for men and women employees - Ask the construction contractor to discipline his workers - Apply punitive measures for sexual offences - Educate workers for health education and hygiene
9.	Potential security issue	<ul style="list-style-type: none"> - Effective walling of the compound - All accesses musts be controlled - Do not let the workers (mostly construction workers) enter the neighbouring villages, without preauthorization - Store building materials under lock and key as far as possible - Ask the building contractor to discipline his workers - Apply punitive measures, such as suspension or termination of employment if necessary

(III) During the Operation Phase

Sr. No.	Impact	Mitigation
1.	Impact on air environment	<ul style="list-style-type: none"> - Comply with ECD's NEQ emission guideline - Do not clear the vegetation (grass) and leave the land have more than necessary - Consolidate and compact all area to prevent generation of dust due to wind - Spray water adequately to suppress dust - Reduce the speed of vehicle to reduce dust generation - Restrict vehicular movement; maintain road, clear of mud and dirt

		<ul style="list-style-type: none"> - Avoid open burning of debris or solid waste - Keep equipment and vehicles well- maintained to reduce smoke - Use fuel with low emission rate (eg. fuel with low sulphur content) - Install covers on conveyor belt to minimize dust generation - Install bag filters to mitigate PM - Apply complete combustion to reduce SO₂, NO_x and other - Regularly collect down ash and cement dust for reuse - Minimize by all means the generation of dust (PM) at the conveyor line, at clinker (cement dust, clinker dust) and also at the cement packaging department; also at storage and haulage of cement bags - Provide PPE (eg. face masks, mouth and nose covers, gas masks) to workers exposed to long hours of dust and smoke; fit excavator with air conditioned cabin for operators
2.	Noise and vibration	<ul style="list-style-type: none"> - Comply with ECD's NEQ noise level guidelines - Restrict or limit vehicular and heavy machinery movements - Plan for appropriate choice of machinery and vehicles (that emit low noise level); method of working, efficient material handling - Well-operated and well-maintained vehicles and machinery generate lower noise level and prevent undesirable noise level - Develop green belt (plant trees) around the mining site and factory; trees abate noise and serve as noise sink (pollution sink) - Create smooth road surface as far as possible to mitigate vibration due to vehicular and heavy machinery movement - Create suitable foundation design for machinery and equipment to mitigate vibration - Provide adequate PPE eg. ear muffs, ear protectors to workers exposed to long hours of high noise level; fit excavator, bulldozer with air conditioned cabin for operators - Conduct regular noise monitoring to ensure that the levels are within noise exposure standard (not higher than 85-90 dBA)
3.	Impact on land environment	<ul style="list-style-type: none"> - Plan for effective management and minimize impacts on the land environment - If possible construct retaining wall to stop erosion or sliding; - Avoid/prevent soil contamination by all means. - Avoid/prevent damage of soil struction. - Avoid all collateral on soil as far as possible

4.	Impact on water environment	<ul style="list-style-type: none"> - Myitnge River is in the east; manage so that activities will not impact the surface water - Manage to prevent erosion and sliding and siltation; not to impact surface water flow dynamic or alter water courses and not to impact on aquatic biodiversity - Fuel oil depot should be away from a river; the depot should be bunded to protect surface water from oil spill - When handling fuel oil avoid accidental spillages into surface water; should spillage occur implement appropriate clean up immediately - Avoid disposing of waste (liquid and solid) into water bodies - Manage water conservation; reduce water consumption; if possible use recycle water for dust suppression and watering plants - Plan and manage to prevent the contamination of soil and eventually groundwater - For storage of fuel drip trays and designated bunded site should be used to protect soil (and hence ground water) from hydrocarbon - Adequately maintain vehicle and machinery to prevent spillages resulting in groundwater contamination - Avoid spillage during the handling of fuel oil - Should accidental spillages occur implement appropriate clean up immediately; do not wash down spill with water; use absorbents or saw dust for clean up
5.	Impact of waste	<ul style="list-style-type: none"> - Track all wastes generated, especially cement dust, ash and all other domestic wastes - Instruct workers for proper handling and disposal of wastes e.g. at the landfill - Follow the 5 Rs principle: reduce, reuse, recover, recycle and redesign, wherever possible - Separate solid waste into categories, use separate bins, disposed at approved landfill - Draw up a plan for the management of waste water - Reduce and minimize the use of water; - Educate and train workers for conservation of water - Wash vehicles and equipment in designated area - No disposal of waste water outside (on land or into water body) - Educate and train workers for good housekeeping practices

6.	Potential impacts on traffic	<ul style="list-style-type: none"> - Draw up a traffic management plans (even though the traffic was light; road users were mostly motorcyclists and pedestrians) - Schedule the logistics especially for trucks - Set up speed limit - Avoid overloading truck - Cover haulage (cement bags, coal, gypsum etc) with tarpaulin - Educate the driver (especially heavy trucks drivers) for driving at reduced speed and adhere to the principle of defensive driving - Try to achieve zero road accident
7.	Occupational health and safety issue	<ul style="list-style-type: none"> - Plan and manage for safe working environment - Try to achieve zero accidents at work place - Educate and train workers for good working practice, good safety practice and good health and hygiene practices - Limit the exposure to heat at kiln (minimum exposure) as practical as possible; remotely regulate and control - Provide adequate PPEs for workers who are exposed to heat, dust, smoke, loud noise etc. - All workers must pass a medical examination in the first place before being employed. - Implement safe and effective procedures for storage, transportation and handling of hazardous materials - Have detail plan for prevention of fire and emergency - Organize basic First Aid Training and Fire Fighting Training - Provision of fire fighting equipment - Set up a factory clinic - Provision of First Aid Kits, medicines and drugs - Display addresses and phone numbers of Fire Bridge, Ambulance Service, Red Cross Society, Hospital and Police Station so that every can see easily - Take out insurance for the cement plant and also fire insurance
8.	Potential social issue	<ul style="list-style-type: none"> - Draw up a plan for management of ill social behaviour and social illness - Educate workers to be good workers; dutiful and well disciplined - Proper training on work place regulation, code of conducts; - Educate workers on appropriate behaviours when dealing with locals; maintain healthy community interaction - Apply punitive measures such as suspension of the wrong doer - Strictly prohibit the drinking of alcohol during working hours - Deal with employees on a fair and square basis - Avoid unhealthy relationship between employer and employees e.g. no case of over worked and underpaid - Maintain good relation with the locals.

9.	Potential security issue	<ul style="list-style-type: none"> - Deploy adequate security personnel day and night; implement strict security - Check all entering and leaving of the factory premise - Provide uniforms and ID for all workers for easy identification - Security should be both for the cement factory and premise - Keep valuable things under lock and key
10.	Visual impact	<ul style="list-style-type: none"> - Reserve green areas as far as possible - Continue the creation of green belt/zone; plant more trees as far as possible - Plant more trees around the factory, create green zone - Use light only for security purpose; avoid the use of excessive bright light

(IV) During the Decommissioning/Rehabilitation Phase

Sr. No.	Impacts	Mitigation
1.	Occupational health and safety	<ul style="list-style-type: none"> - Plan and manage for effective decommissioning of site. - Plan and execute safe decommissioning. - Hire decommissioning contractor to do the work. - Always practice good safety working practice. - Dispose materials that are no longer useable; redeploy or put up for sale those that are useable. - Restore the ground and soil profile. - Re-vegetate and rehabilitate the ground; plant trees. - Remove and clear all debris and tidy up the place.
2.	Potential residual impacts	<ul style="list-style-type: none"> - Plan and manage for effective decommissioning and rehabilitation. - Clear and remove all residuals, if any. - Remove all soil contaminated by fuel oils or chemicals; if any. - Test the air, water and soil for the last time - Test the soil; ensure that no contaminants remain. - Also test the river water for possible pollutant. - Restore the soil to its natural condition. - Re-vegetate and rehabilitate the site.

All options of mitigation measures to be taken are described in technical detail later in **Chapter 6**.

Potential natural hazards

Large scale potential impacts due to natural hazard, such as violent storms, major floods, earthquakes and major wildfire are not envisaged.

The area is far away from the coast and protected by the mountains; violent storms never occur here, according to interviews. The elevation at the factory is 239 m above sea level and there are no great rivers nearby for causing floods; the area does not have heavy rainfall to induce flood.

There was/is no precedents of major earthquake in the area, within the last 5 decades but only small tremors, the elderly interviewees said, also no precedent of extreme weather event, excessive rainfall, draught and also major wildfire (from interviewees).

The significant cumulative impact in the form of successive addition of impacts such as the accumulative impact on biological components; cumulative impact on natural resources (limestone); cumulative impact of industrial activities and the accumulation of dust and ash are addressed in **Chapter 6**.

Environmental management plan (EMP)

The Environmental Management Plan (EMP) is the key to ensure that the environmental quality (as well as social quality) of the area do not deteriorate due to the implementation of a project. EMP covers the management of overall environmental issues, including the physical, biological, socio-economic, cultural and visual issues.

The negative impacts and subsequent mitigation measures are integral parts of EMP.

The sub-plans for each issue or component for each project phase as prescribed by ECD in "EIA Procedures, Notification No. 616/2015; Section 63, Subsection 6, 6.2.1" are described in details in Chapter 8, 8.6.

EMP cell

An EMP cell (a small nucleus organization) is formed for the effective implementation of EMP and MP. This EMP cell is also the monitoring committee. Two local villagers are added to this monitoring committee.

Young Investment Group Industry Co., Ltd has formed the EMP cell as follows:

Sr. No.	Name	Designation	Responsibility
1.	U Nyi Nyi Tun	Head of cement factory	EMP cell leader
2.	U Pyi Thein Kyaw	Deputy General Manager	EMP cell member
3.	U Zaw Thein	Engineer	EMP cell member
4.	U Maung Htwe	Technician	EMP cell member
5.	U Aung Kyi	Technician	EMP cell member
6.	U Kan Sa	Member of village administrator, Nat Yay Kan village	EMP cell member
7.	U Maung Than	Member of village administrator, Kandwin village	EMP cell member

Later 10-15 staffs will be added to the list of the EMP cell members, as alternate members. They will be specially trained for implementation of EMP involving taking mitigation measures, conducting monitoring and other EMP duties.

Fund for EMP

0.5 percent of the total budget (which is equivalent to USD 1,280,536) is allotted for EMP programme.

The sub-budgets allotted for each programme under EMP are as follows:

- Cost for organizing EMP - 2% of EMP fund (USD 25,610)
- Cost for execution and dissemination of EMP in the form of:
 - (a) Taking mitigation action - 25% of EMP fund (USD 320,134)
 - (b) Monitoring action - 25% of EMP fund (USD 320,134)
- Cost for procurement of equipment and materials - 20% of EMP fund (USD 256,107)
- Cost for capacity building and training - 7% of EMP fund (USD 89,637)
- Cost for emergency/contingency (allotted for probable emergency cases) - 10% of EMP fund (USD 128,053)
- Cost for documentation and reporting - 8% of EMP fund (USD 102,442)
- Miscellaneous (casual fees for two villagers, who are members of EMP cell) - 3% of EMP fund (USD 38,416)

Labour cost will be kept at a minimum. Only staffs will be involved in the implementation of EMP. Staff will be first trained for this EMP purpose.

The above mentioned cost estimation is based on the current unit price. Because the project will be implemented over many years (even decades) price fluctuation and inflation will be unavoidable. A contingency amount shall be prepared for any unavoidable event in the future.

Environmental Monitoring Plan (EMoP)

Monitoring is essential for the meaningful and successful implementation of EMP. Monitoring involves overall monitoring of all environmental and social issues, compliance monitoring and specific monitoring for certain issues. (The overall and comprehensive monitoring plans are shown in tabulated form in Chapter 6 (6.1.6). Pragmatic monitoring of physical components are shown below:

Summary of monitoring plan during the Construction Phase

Sr No.	Component	Parameter to be monitored	Monitoring point	Frequency	Responsible person	Cost (once off)
1	Air quality	- NO ₂ , SO ₂ , PM ₁₀ , PM _{2.5} , O ₃ , CO, VOC etc	- at factory compound, Coordinate: N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0"	once during Construction Phase	Hired technicians	Ks 1,700,000
			- at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5"	once during Construction Phase	Hired technicians	Ks 1,700,000
			- at Kandwin village Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"	once during Construction Phase	Hired technicians	Ks 1,700,000
2	Water quality	- Total coliforms, Fecal coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron, P ^H , Sulphate, Total Dissolved Solids	- at Myitnge river Coordinate: N. Lat. 21° 46' 38.3"; E. Long. 96° 16' 30.3"	once during Construction Phase	Hired technicians	Ks 200,000
			- at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 35.9"; E. Long. 96° 14' 52.0"	once during Construction Phase	Hired technicians	Ks 200,000

			- at Kandwin village Coordinate: N. Lat. 21° 46' 53.1"; E. Long. 96° 14' 15.0"	once during Construction Phase	Hired technicians	Ks 200,000
3	Noise and vibration	- dBA day time and night time	- at factory compound Coordinate: N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0"	once during Construction Phase	Hired technicians	Ks 200,000
			- at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5"	once during Construction Phase	Hired technicians	Ks 200,000
			- at Kandwin village Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"	once during Construction Phase	Hired technicians	Ks 200,000
4	Solid waste	- Regular visual inspection of construction wastes - Also monitor domestic waste; quantity generated per month, collection and disposal activities	- inside the compound Coordinate: N. Lat. 21°44'51.48"; E. Long. 96°16'49.02"	- Monthly	EMP cell members and 15 trained staff	Free of charges
5	Soil	- Monitor soil quality; texture, sand, silt, clay, pH, moisture, total N, P	- inside factory compound Coordinate: N. Lat. 21° 44' 44.7"; E. Long. 96° 16' 40.1"	- once during Construction Phase	Hired technicians	Ks 50,000

		<ul style="list-style-type: none"> - Monitor earth works (construction work) - Monitor potential soil structure and soil profile damage, if any and make corrective measures - Inspect potential contamination of soil by fuel spill - Regularly inspect lavatories; take corrective measures where necessary - Monitor potential erosion (wet months) 	<ul style="list-style-type: none"> - at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 33.3"; E. Long. 96° 15' 01.8" - at Kandwin village Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 14.1" 	<ul style="list-style-type: none"> - once during Construction Phase - once during Construction - Weekly - Monthly - Monthly - Monthly - Monthly 	<ul style="list-style-type: none"> Hired technicians Hired technicians EMP cell members and 15 trained staff 	<ul style="list-style-type: none"> Ks 50,000 Ks 50,000 Free of charges
6	Hazardous materials and waste	<ul style="list-style-type: none"> - Monitor the storage, handling and uses of fuel oil - Monitor the collection of used fuel oil, engine oil in old drums and give away to local recycler - Monitor disposal of lamp, bulb, battery, filters 	<ul style="list-style-type: none"> - fuel depot Coordinate: N. Lat. 21°45'5.44"; E. Long. 96°16'35.61" - at landfill area Coordinate: N. Lat. 21°45'23.29"; E. Long. 96°16'18.18" 	<ul style="list-style-type: none"> - Monthly - Monthly 	<ul style="list-style-type: none"> EMP cell members and 15 trained staff EMP cell members and 15 trained staff 	<ul style="list-style-type: none"> Free of charges Free of charges

7	Occupational Health and Safety	<ul style="list-style-type: none"> - Regular inspection of working place (construction site) and working condition - Inspect the storage of first aid kits, medicine and drugs, take corrective measures, if necessary - Keep a record book for incidents injuries and sickness for the Construction Phase and regularly monitor the record book; take corrective measures, when necessary 	- inside the compound Coordinate: N. Lat. 21°45'17.60"; E. Long. 96°16'29.79"	<ul style="list-style-type: none"> - Weekly - Monthly - Monthly 	EMP cell members and 15 trained staff	Free of charges
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Summary of monitoring programme on physical environment during Operation Phase

Sr No.	Component	Parameter to be monitored	Monitoring point	Frequency	Responsible person	Cost (once off)
1	Air quality emission	- NO ₂ , SO ₂ , PM ₁₀ , PM _{2.5} , O ₃ , CO, VOC etc	- at factory compound Coordinate: N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0"	semi-annually	Hired technicians	Ks 1,700,000
			- at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5	semi-annually	Hired technicians	Ks 1,700,000
			- at Kandwin village Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"	semi-annually	Hired technicians	Ks 1,700,000

2	Water quality/effluent	<u>water quality</u>	- at Myitnge river Coordinate: N. Lat. 21° 46' 38.3"; E. Long. 96° 16' 30.3"	semi-annually	Hired technicians	Ks 200,000
			- at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 35.9"; E. Long. 96° 14' 52.0"	semi-annually	Hired technicians	Ks 200,000
			- at Kandwin village Coordinate: N. Lat. 21° 46' 53.1"; E. Long. 96° 14' 15.0"	semi-annually	Hired technicians	Ks 200,000
		<u>Effluent</u>	- at discharge area Coordinate: N. Lat. 21° 44' 56.73"; E. Long. 96° 16' 42.43"	semi-annually	Hired technicians	Ks 50,000
3	Noise and vibration level	- dBA during day time and night time;	- at factory compound Coordinate: N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0"	semi-annually	Hired technicians	Ks 200,000
			- at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5"	semi-annually	Hired technicians	Ks 200,000
			- at Kandwin village Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"	semi-annually	Hired technicians	Ks 200,000

4	Solid waste	<ul style="list-style-type: none"> - Regular visual inspection of solid wastes - Monitor record book or log book of solid wastes (industrial and domestic) generated per month; quantity, and mode of collection and disposal; make correction if necessary; 	<ul style="list-style-type: none"> - log books and at the company's land fill; <p>Coordinate: N. Lat. 21°44'51.48"; E. Long. 96°16'49.02"</p>	<ul style="list-style-type: none"> - Weekly, Monthly 	EMP cell members and 15 trained staff	Free of charges
5	Soil	<ul style="list-style-type: none"> - Monitor potential erosion (wet months) and potential contamination of soil by fuel spill; tackle the issue promptly - Regular inspection of warehouse area and oil depot area - Monitor soil quality; texture, sand, silt, clay, pH, moisture, total N, P 	<ul style="list-style-type: none"> - inside and around the compound - around warehouse and fuel depot <p>Coordinate: N. Lat. 21°45'5.44"; E. Long. 96°16'35.61"</p> <ul style="list-style-type: none"> - inside factory compound <p>Coordinate: N. Lat. 21° 44' 44.7"; E. Long. 96° 16' 40.1"</p> <ul style="list-style-type: none"> - at Nat Yay Kan village <p>Coordinate: N. Lat. 21° 44' 33.3"; E. Long. 96° 15' 01.8"</p> <ul style="list-style-type: none"> - at Kandwin village <p>Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 14.1"</p>	<ul style="list-style-type: none"> - Monthly - Monthly <p>semi-annually</p> <p>semi-annually</p> <p>semi-annually</p>	<p>EMP cell members and 15 trained staff</p> <p>Hired technicians</p> <p>Hired technicians</p> <p>Hired technicians</p>	<p>Free of charges</p> <p>Ks 50,000</p> <p>Ks 50,000</p> <p>Ks 50,000</p>

6	Hazardous materials and hazardous waste	- Monitor the storage, handling and uses of fuel oils, inspect fuel depot regularly	- at fuel depot Coordinate: N. Lat. 21° 45' 5.44"; E. Long. 96° 16' 35.61"	Weekly/ Monthly	EMP cell members and 15 trained staff	Free of charges
		- Monitor the collection of used fuel oil engine oil in old drums and give away to recyclers - Monitor the collection of used filter bags, lamp, bulbs, battery and their disposal at landfill	- waste bins and landfill Coordinate: N. Lat. 21° 45' 23.29"; E. Long. 96° 16' 18.18"	Weekly/ Monthly	EMP cell members and 15 trained staff	Free of charges
7	Occupational Health and Safety	- Regular inspection of work place and working condition; make correction where necessary	- all working places Coordinate: N. Lat. 21° 45' 17.60"; E. Long. 96° 16' 29.79"	- Monthly	EMP cell members and 20 trained staff	- Free of charges
		- Inspection condition of factory's clinic; monitor the log books on accidents, injuries and sickness; member of patient treated at clinic, and those that are submitted to the nearest hospital	- factory's clinic Coordinate: N. Lat. 21° 44' 49.46"; E. Long. 96° 16' 30.95"	- Monthly	EMP cell members and 20 trained staff	- Free of charges
		- Inspect the medicine and drugs stock; refill where necessary - Monitor the first aid training and fire-fighting training	- factory compound during training session	- Monthly - once during session	EMP cell members and 15 trained staff Invited trainers	- Free of charges - Ks 2,000,000 Honourarian fees for two training programmes
		- Monitor other training on educative session (lectures on OHS given by invited trainer/lecturer etc.).	- Hall during educative lecture session	- once during session	Invited lecturer/trainer	- Ks 300,000 (presents or courtesy gifts) for lecturer

Public Consultation

The company has conducted many informal/formal and public consultations with locals from time to time.

- The first public consultation meeting between the responsible officers of the company the local was held on 20-3-2014 at the village monastery.
- The second public meeting was held on 20-3-2017.
- Meeting between the company's officers and members of Hluttaws (3 members) and other government officials was held on 28-3-2017.
- Site inspection by the members of Hluttaw and government officials was made on 1-4-2017.
- A public consultation meeting was held during the scoping study (20-7-2017).
- Two public consultation meetings were held during the EIA study trip, one at Nat Yay Kan village on 18-1-2024 (13:00 – 14:00 hours), and another at Kandwin village on 18-1-2024 (15:00 – 16:00 hours).

Public consultation (20-7-2017, during scoping study)

During this meeting one local, U Paw Swe asked the company to prioritize the employment of the local youth.

One local U Thaung Shwe asked for the construction of a bridge at the spot which is submerged during the rainy season.

The company's officer replied that he would report this matter to the company's authority and take action when the proposed project commerce.

Public consultation (18-1-2024, at Nat Yay Kan village during EIA study)

One local expressed his hope that many locals will have job opportunities because of this proposed project.

Another local said our local people mostly work as seasonal workers. He hoped that many locals will get permanent job from the project.

Another local wanted the company to provide more assistance to the locals.

The company's officers U Nyi Nyi Tun said that he has recorded and documented all the comment and will do his best for these comments.

Public consultation (18-1-2024, Kandwin village during EIA study)

One local expressed his hope that there will more job opportunities.

Another local, U Win Aung, requested company to donate money for the renovation of village school.

The company's officer, U Nyi Nyi Tun, has replied that he would report the matter and do his best for this matter.

Note – the project has not commenced yet; still in the Preconstruction Phase.

All the minutes of meeting were documented in the EIA report.

Recommendation for future consultation and setting up of Grievance Redress Mechanism (GRM) programme was also mentioned in the report.

CONCLUSION

The project will contribute to the increases in GDP of the country from direct investment of USD 256.1072 million and also increase in the earning for the nation in the form of tax, duty and revenue.

It will bring employment opportunities for hundreds of locals. There is no doubt that it will be economically viable and environmentally sustainable if all the rules, regulations and statutory requirements are complied with and all mitigation measures are taken and EMP is effectively executed.

The project proponent believes that the project can be successfully implemented without any serious adverse impact on the environment.

2. INTRODUCTION

After a change in political system in 1988 and the introduction of market economy there was a boom in construction since then.

Cement is an essential building material and the country has still to partially import cement for construction work. Cement should be readily available at seasonal price throughout the country. With infrastructure development in progress the demand for cement will remain high.

With this in mind the project proponent, Young Investment Group Industry Co., Ltd has proposed for the Construction and Operation of a cement factory (capacity 5000 tons/day) near Nat Yay Kan village, Kyaukse Township, Mandalay Region. When the factory is in operation it will contribute greatly to fulfilling the need for the construction sector of the nation.

2.1 Presentation of the project proponent

The project proponent, Young Investment Group Industry Co., Ltd was registered as a private company limited by shares in January 2011 and renewed in July 2013. The new registration No. is 109000547; dated: 13-1-2011. The company has also obtained the permit from MIC (Document: 817/2011, Dated: 8-11-2011). (Amended permit-29-11-2019)

About the project proponent

Name of the project proponent	: Young Investment Group Industry Co., Ltd
Address	: No. 886/888, 9 Mile, Pyay Road, 5 Ward, Mayangone Township, Yangon Region
Contact person	: Daw Hla Myat Thu
Phone	: 09 457741383
E-mail	: hlamyatthu@yigmm.com
Location of project site	: Mya Leik Taung Area, near Nat Yay Kan Village, Theyet Pin Village Tract, Kyaukse Township, Mandalay Region

The managing director is U Thiha Aung and there are 3 directors, Daw Nang Saw Htwe, Daw Khin Myint and Daw Hla Myat Thu.

The company is 100% owned by nationals.

Particulars of executive and administrative body

Name	Nationality & National Registration Card No.	Designation
U Thiha Aung	Myanmar 13/La Ya Na (N)083483	Managing Director
Daw Nang Saw Htwe	Myanmar 1/Ma Ka Ta (N)049490	Director
Daw Khin Myint	Myanmar 13/La Ya Na (N)093409	Director
Daw Hla Myat Thu	Myanmar 12/Ba Ha Na (N)081655	Director

The shares are ordinary shares.

The total number of shares allotted is - 500,000 Shares

Each share is worth - 10000 (Kyat ten thousands only)

Total amount paid, - 5,000,000,000 Kyats

Share members have taken the number of shares as follow:

U Thiha Aung has taken - 498,525 number of shares

Daw Nang Saw Htwe has taken - 1,000 number of shares

Daw Khin Myint has taken - 475 number of shares

500,000 number of shares



ကုမ္ပဏီမှတ်ပုံတင်လက်မှတ်
Certificate of Incorporation

တက်လူရင်းနှီးမြုပ်နှံမှုအဖွဲ့စက်မှုထုတ်လုပ်မှုကုမ္ပဏီလီမိတက်
YOUNG INVESTMENT GROUP INDUSTRY COMPANY LIMITED
Company Registration No. 109000574

မြန်မာနိုင်ငံကုမ္ပဏီများအက်ဥပဒေ ၁၉၁၄ ခုနှစ် အရ
တက်လူရင်းနှီးမြုပ်နှံမှုအဖွဲ့စက်မှုထုတ်လုပ်မှုကုမ္ပဏီလီမိတက်
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အစုရှယ်ယာအားဖြင့် တာဝန်ကန့်သတ်ထား သည့် အများနှင့်မသက်ဆိုင်သောကုမ္ပဏီ
အဖြစ် ဖွဲ့စည်းမှတ်ပုံတင်ခွင့် ပြုလိုက်သည်။

This is to certify that
YOUNG INVESTMENT GROUP INDUSTRY COMPANY LIMITED
was incorporated under the Myanmar Companies Act 1914 on 13 January
2011 as a Private Company Limited by Shares.

ကုမ္ပဏီမှတ်ပုံတင်အရာရှိ
Registrar of Companies
ရင်းနှီးမြုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန
Directorate of Investment and Company Administration



Former Registration No. 2021/2010-2011

Figure – 1: Certificate of Incorporation



မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှုကော်မရှင်
ခွင့် ပြု မိန့်



ခွင့်ပြုမိန့် အမှတ်၊ မနသ -၈၁၇...../၂၀၁၁ : ၂၀၁၁ ခုနှစ်၊ နိုဝင်ဘာ လ ၀၂ ရက်။

မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်သည် မြန်မာနိုင်ငံသားများ ရင်းနှီးမြှုပ်နှံမှု ဥပဒေပုဒ်မ ၁၀ အရ ဤခွင့်ပြုမိန့်ကို ထုတ်ပေးလိုက်သည်။

- (က) ရင်းနှီးမြှုပ်နှံသူ၏ အမည်ဦးသီဟအောင်.....
- (ခ) အဘ အမည်ဦးရန်ကွမ်းရှောက်.....
- (ဂ) နိုင်ငံသား/ အမျိုးသားမှတ်ပုံတင်အမှတ်..... ၁၃/လရန(နိုင်) ၀၈၃၄၈၃.....
- (ဃ) နေရပ်လိပ်စာ အမှတ်(၆၄၇-အေ)၊ ပြည်လမ်း၊ ကမာရွတ်မြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။
.....
- (င) ဖွဲ့စည်းထားသည့် သို့မဟုတ် ဖွဲ့စည်းမည့်အဖွဲ့အစည်း တက်လူရင်းနှီးမြှုပ်နှံမှုအဖွဲ့စက်မှုထုတ်လုပ်မှု
.....ကုမ္ပဏီလီမိတက် (Young Investment Group Industry Co., Ltd.)
- (စ) ရင်းနှီးမြှုပ်နှံမှုပြုလုပ်မည့် လုပ်ငန်းအမျိုးအစား တစ်နေ့လျှင် တန်(၄၀၀၀)ကျ.....
.....ဘိလပ်မြေထုတ်လုပ်ခြင်းလုပ်ငန်း.....
- (ဆ) ရင်းနှီးမြှုပ်နှံမှုပြုလုပ်သည့် အရပ်ဒေသ (များ)မြလိပ်တောင်ဒေသ၊ စဉ့်ကိုင်မြို့နယ်၊
.....ကျောက်ဆည်ခရိုင်၊ မန္တလေးတိုင်းဒေသကြီး။
- (ဇ) မတည်ငွေရင်းပမာဏ (ကျပ်) ..၃၀၉၂၆,၃၃ (သန်း) (အမေရိကန်ဒေါ်လာ (၄၇,၂၀)သန်းအပါအဝင်
စုစုပေါင်းကျပ်သန်းသုံးသောင်း ကိုးရာ နှစ်ဆယ့်ခြောက်သန်း၊
သုံးသိန်း ၊ သုံးသောင်း)



ဥက္ကဋ္ဌ
မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်

Figure – 2: MIC permit



ပုံစံ(၂)
ပူးတွဲ-၁

ပြည်ထောင်စုသယံဇာတနှင့်သိုလှော်ရေးဝန်ကြီးဌာန
မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်

၂၀၁၁ ခုနှစ် နိုဝင်ဘာလ ၈ ရက်စွဲပါ ခွင့်ပြုမိန့်အမှတ် ၈၁၇/၂၀၁၁ တွင် ပြင်ဆင်ချက်

၂၀၁၇ ခုနှစ် နိုဝင်ဘာလ ၁၀ ရက်နေ့တွင် ကျင်းပပြုလုပ်သော မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်၏ ၁၅/၂၀၁၇ အစည်းအဝေးဆုံးဖြတ်ချက်အရ တက်လူ ရင်းနှီးမြှုပ်နှံမှု အဖွဲ့ စက်မှု ထုတ်လုပ်မှု ကုမ္ပဏီ လီမိတက် (Young Investment Group Industry Co., Ltd.) ၏ ရင်းနှီးမြှုပ်နှံမှု ပြုလုပ်မည့် လုပ်ငန်းအမျိုးအစားအား တစ်နေ့လျှင် တန် ၄,၀၀၀ ကျ ဘီလပ်မြေ ထုတ်လုပ်ခြင်း လုပ်ငန်းမှ တစ်နေ့လျှင် တန် ၁၀,၀၀၀ ကျ ဘီလပ်မြေ ထုတ်လုပ်ခြင်းလုပ်ငန်းဟု လည်းကောင်း၊ မတည်ငွေရင်းပမာဏအား အမေရိကန်ဒေါ်လာ ၄၇.၂၀ သန်းအပါအဝင် ကျပ် ၃၀,၉၂၆.၃၃ သန်းမှ အမေရိကန်ဒေါ်လာ ၆၈.၅၉ သန်းအပါအဝင် ကျပ် ၁၁၃,၉၀၄.၁၀ သန်း ဟု လည်းကောင်း ပြောင်းလဲပြင်ဆင်ခွင့်ပြုလိုက်သည်။

- (စ) ရင်းနှီးမြှုပ်နှံမှုပြုလုပ်မည့်လုပ်ငန်းအမျိုးအစား တန် ၁၀,၀၀၀ ကျ ဘီလပ်မြေ ထုတ်လုပ်ခြင်းလုပ်ငန်း
- (ခ) မတည်ငွေရင်းပမာဏ (ကျပ်) ကျပ် ၁၁၃,၉၀၄.၁၀ သန်း (အမေရိကန် ဒေါ်လာ ၆၈.၅၉ သန်း အပါအဝင် စုစုပေါင်း ကျပ် တစ်သိန်းတစ်သောင်း သုံးထောင် ကိုးရာလေးသန်းနှင့် တစ်သိန်းတိတိ)

(မြသုဇာ)
တွဲဖက်အတွင်းရေးမှူး
၈

ရက်စွဲ၊ ၂၀၁၇ ခုနှစ် နိုဝင်ဘာလ ၂၉ ရက်
နေရာ၊ ရန်ကုန်မြို့

Figure – 3: Amended MIC Permit



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
 သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန
 ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန
 ညွှန်ကြားရေးမှူးချုပ်ရုံး

စာအမှတ်အီးအိုင်အေ - ၁/၈/အတည်ပြု(SR)(/၂၀၂၂)
 ရက်စွဲ ၂၀၂၂ ခုနှစ် အောက်တိုဘာလ ၁၁ ရက်

သို့

အုပ်ချုပ်မှုဒါရိုက်တာ
 တက်လူရင်းနှီးမြှုပ်နှံမှုအဖွဲ့၊ စက်မှုထုတ်လုပ်မှုကုမ္ပဏီလီမိတက်
 မြလိပ်တောင်ဒေသ၊ သရက်ပင်ကျေးရွာအုပ်စု၊ ကျောက်ဆည်မြို့နယ်၊ ကျောက်ဆည်ခရိုင်
 မန္တလေးတိုင်းဒေသကြီး
 ၀၉-၄၅၇၇၄၁၃၈၃၊ hlamyatthu@yigmm.com

အကြောင်းအရာ။ တက်လူရင်းနှီးမြှုပ်နှံမှုအဖွဲ့၊ စက်မှုထုတ်လုပ်မှုကုမ္ပဏီမှ မန္တလေးတိုင်းဒေသကြီး
 ကျောက်ဆည်ခရိုင်၊ ကျောက်ဆည်မြို့နယ်၊ သရက်ပင်ကျေးရွာအုပ်စု၊
 မြလိပ်တောင်ဒေသရှိ မြေဧရိယာ (၅၁၃.၁၆) ဧကပေါ်တွင် အကောင်အထည်
 ဖော်ဆောင်ရွက်မည့်တစ်ရက်လျှင် တန် (၁၀,၀၀၀) ကျ ဘီလပ်မြေထုတ်လုပ်ခြင်း
 စီမံကိန်းအတွက် နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်း အစီရင်ခံစာအား
 အတည်ပြုနိုင်ပါကြောင်း ပြန်ကြားခြင်း

- ရည်ညွှန်းချက်။ (၁) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၊ ဦးစီးရုံးချုပ်၏ ၃၀-၉-၂၀၂၂ ရက်စွဲပါ
 စာအမှတ်၊ အီးအိုင်အေ-၁/၈/အတည်ပြု (SR) (၂၄၆၉/၂၀၂၂)
 (၂) သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဝန်ကြီးဌာန၊
 ပြည်ထောင်စုဝန်ကြီးရုံး၏ ၁၂-၁၀-၂၀၂၂ ရက်စွဲပါ စာအမှတ်၊
 (သစ်တော)၃(၂)/၁၆(ဃ)(၃၅၀၄/၂၀၂၂)

၁။ အကြောင်းအရာပါကိစ္စနှင့်ပတ်သက်၍ တက်လူရင်းနှီးမြှုပ်နှံမှုအဖွဲ့၊ စက်မှုထုတ်လုပ်မှု
 ကုမ္ပဏီလီမိတက်မှ မန္တလေးတိုင်းဒေသကြီး၊ ကျောက်ဆည်ခရိုင်၊ ကျောက်ဆည်မြို့နယ်၊ သရက်ပင်
 ကျေးရွာအုပ်စု၊ မြလိပ်တောင်ဒေသရှိ မြေဧရိယာ (၅၁၃.၁၆) ဧကပေါ်တွင် အကောင်အထည်
 ဖော်ဆောင်ရွက်မည်ဖြစ်ပါသည်။ စီမံကိန်းနေရာသည် နိမ့်သောတောင်တန်းများနှင့် တောင်ကုန်းများ
 ရှိသော ပြန့်ပြူးသော မြေပြင်အနေအထားတွင်ရှိပါသည်။ စီမံကိန်း၏ ရည်ရွယ်ချက်မှာ မြလိပ်တောင်မှ
 ထုံးကျောက်ရယူကာ တစ်နေ့လျှင် တန် (၅,၀၀၀) ကျ ထွက်ရှိသည့် (၂) လိုင်း ဘီလပ်မြေစက်ရုံ

Figure – 4: Scoping approval letter

2.1 Presentation of Environmental and social experts of Myanmar Environment Sustainable Conservation (MESC) Co., Ltd

MESC is a consultant firm officially registered in 2014 as a limited company (a consultant/service company) at the Ministry of National Planning and Economic Development. Document: YaKa-8(Ga) 001/2014(004720), dated: 6th June, 2014. Registration No. 830/2014-2015, (20-5-2014).

The Transitional Registration/License No. of the consultant firm, MESC is No. 0003, ECD, Dated 1st July 2017.

Contact Address : Room no. (B -5), Building no.67/69, Parami Road, 16 Ward, Hlaing Township, Yangon

Contact person : Myint Kyaw Thura
95 9 420105071

Contact number : 95 9 73044903

E-mail : myanmar.esc@gmail.com

Members of MESC who are IEE/EIA appraisers, or IEE/EIA practitioners or who are involved in this IEE/EIA project are as follows –

Name	Nationality & National Registration Card No.	Registration /license No. by ECD	Responsibilities
U Myint Kyaw Thura M.Sc (Zoology)	Myanmar 12/Da Ga Ta (N)028349	0006	Ecology and Biodiversity, Social studies and analysis, General environmental management
U Saw Han Shein B.Sc (Botany) M.Sc (Marine Biology)	Myanmar 10/Ma La Ma(N)008173	0007	Ecology and Biodiversity, Risk assessment and risk management, Prevention, Controlling, Monitoring and Impact Prediction of Water Pollution;
U Tin Tun Aung B.Sc (Engineering)	Myanmar 12/U Ka Ma (N)172111	0009	Monitoring of Air Pollution
U Than Soe Oo M.Sc (Forestry)	Myanmar 9/Ma Na Ma (N) 050808	00011	Land Use, Natural resource management (Forestry)

U Oakka Kyaw Thu B.Sc (Geology)	Myanmar 7/Ya Ta Ya (N) 090371	00012	Geological Survey, Soil conservation
Daw Thin Thin Yee B.Sc (Chemistry)	Myanmar 12/Tha Ga Ka (N)039292	00013	Prevention and control of Air Pollution
U Thura Ko B.A (History)	Myanmar 12/Ka Ma Na (N) 124824	00277	Archeology and Cultural Heritage, Noise and vibration, Social studies and analysis
Daw Khin Thidar La Wun	Myanmar 12/Sa Kha Na (N) 069879	part time	Weather and air quality analysis and forecasting, Hydrology, Ground water and underground water management, Solid waste and hazardous waste management

MESC has also part time members working as free lances.

The firm is not in a position to employ all its part time members on a permanent basis.

These are botanists, zoologists, ornithologists, ecologists, aquatic ecologists, social scientists, engineers and geologists working with this firm.

For the physical and chemical environmental studies MESC has to hire experts, say for example, from registered laboratory in Yangon. Experts from a registered laboratory were hired for the analysis of water (or samples have to be sent to the laboratory).

Members of MESC have quite a lot of experiences with IEE, EIA and SIA works.



REPUBLIC OF THE UNION OF MYANMAR

Ministry of Natural Resources and Environmental Conservation

CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION

(ကြားကာလအကြိမ်းပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)



No. 0003 Date 31.3.2018

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the organization under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၅၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို အဖွဲ့အစည်းအား ထုတ်ပေးလိုက်သည်။)

- (a) Name of Organization (အဖွဲ့အစည်းအမည်) Myanmar Environment Sustainable Conservation-MESC
- (b) Name of the representative in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ အမည်) U Myint Kyaw Thura
- (c) Citizenship of the representative in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ နိုင်ငံသား) Myanmar
- (d) Identity Card /Passport Number of the representative person in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ မှတ်ပုံတင်/ နိုင်ငံကူးလက်မှတ် အမှတ်) 12/ Da Ga Ta (N) 028349
- (e) Address of organization (ဆက်သွယ်ရန်လိပ်စာ) Room No. B-5, Building No.72, Marlar Myaing 6th street, 16 Ward, Hlaing Township, Yangon. myanmar_esc@gmail.com , 09 73044903
- (f) Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား) Organization
- (g) Duration of validity (သက်တမ်းကုန်ဆုံးရက်) 31 March 2018



EXTENSION
 သက်တမ်းတိုးကြွင်း
 The VALIDITY of this certificate is extended for one year from (1.4.2018) to (31.3.2019)
 ဤလက်မှတ်အား (၁-၄-၂၀၁၈) မှတ်ပုံတင် (၃၁.၃.၂၀၁၉) ရက်နေ့အထိ ဆက်တမ်းတိုးကြွင်းသည်
 See Nang
 13.4.2018
 For Director General
 (See Nang, Director)
 Environmental Conservation Department

31.3.2018

Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation

Areas of Expertise Permitted
(ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Air Pollution Control
2. Ecology and Biodiversity
3. Facilitation of Meeting
4. Geology and Soil
5. Land use
6. Modeling for Water Quality
7. Socio-Economy
8. Water Pollution Control

EXTENSION
(သက်တမ်းတိုးခြင်း)
The VALIDITY of this certificate is extended for two months from (1.7.2023) to (31.8.2023)
ဤလက်မှတ်အား (၁-၇-၂၀၂၃) ရက်နေ့မှ (၃၁-၈-၂၀၂၃) ရက်နေ့အထိ (၂)လ သက်တမ်းတိုးပြုခဲ့သည်။
Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

EXTENSION
(သက်တမ်းတိုးခြင်း)
The VALIDITY of this certificate is extended for one year from (1.1.2020) to (31.12.2020)
ဤလက်မှတ်အား (၁-၁-၂၀၂၀) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၀) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးပြုခဲ့သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
(သက်တမ်းတိုးခြင်း)
The VALIDITY of this certificate is extended for nine months from (1.4.2019) to (31.12.2019)
ဤလက်မှတ်အား (၁-၄-၂၀၁၉) ရက်နေ့မှ (၃၁-၁၂-၂၀၁၉) ရက်နေ့အထိ (၉)လ သက်တမ်းတိုးပြုခဲ့သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
(သက်တမ်းတိုးခြင်း)
The VALIDITY of this certificate is extended for six months from (1.1.2021) to (31.12.2021)
ဤလက်မှတ်အား (၁-၁-၂၀၂၁) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးပြုခဲ့သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
(သက်တမ်းတိုးခြင်း)
The VALIDITY of this certificate is extended for six months from (1.7.2021) to (31.12.2021)
ဤလက်မှတ်အား (၁-၇-၂၀၂၁) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးပြုခဲ့သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးခြင်း)
The VALIDITY of this certificate is extended for one year from (1.1.2022) to (31.12.2022)
ဤလက်မှတ်အား (၁-၁-၂၀၂၂) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၂) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးပြုခဲ့သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးခြင်း)
The VALIDITY of this certificate is extended for six months from (1.1.2023) to (30.6.2023)
ဤလက်မှတ်အား (၁-၁-၂၀၂၃) ရက်နေ့မှ (၃၀-၆-၂၀၂၃) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးပြုခဲ့သည်။
Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

Figure-5: Certificate of consultant firm

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ဒဂုံတက္ကသိုလ်



Dagon University

သိပ္ပံ ဝိညာဏ်
Bachelor of Science

ဦးနော်: _____ ဦးအောင်/သမီး
 မောင်အိတ်ကလေးဝင်း: _____
 ဒဂုံတက္ကသိုလ်၏ သိပ္ပံဝိညာဏ်အောင်မြင်ရေးဖြင့် သိလိုက်သည်။
 အထူးပြုဆိုင်ရာ: သင်္ချာ
 သွေးရေမှတ်ပုံတင်အမှတ်: ၄၃၃၇၃

This is to certify that
Ma Khin Thidar La Wun _____ son/daughter of
U La Win _____ has been admitted
 to the Degree of Bachelor of Science in this University.

Subject of Specialization Mathematics
 Registered Graduate No. 43373

2008, September




 ပါမောက္ခချုပ်
 ဒဂုံတက္ကသိုလ်
 Rector
 Dagon University

ရန်ကင်းမြို့၊
 ၂၀၀၉ ခု ဇန်နဝါရီလ ၂ ရက်
 Yangon, 2nd Feb: 2009

Figure-6: Certificate of Khin Thidar La Wun

3. ENVIRONMENTAL POLICY, LEGAL AND INSTITUTIONAL FRAME WORK

3.1 Corporate environmental and social policy

Young Investment Group Industry Co., Ltd, one of the leading cement production companies in Myanmar has environmental policy of its own. The first and foremost policy is to obey, abide and comply with all laws and rules relating to physical and social environment. Most of all, it will follow all the rules and regulations set up by the Environmental Conservation Department, the main agency responsible for environmental management in Myanmar. The company pledges to do a cement business that will be environmentally sound as far as possible.

The company shall endeavour to:

- Operate the cement factory and limestone quarry with an environmentally and socially responsible manner and to comply with laws and regulation
- Prevent pollution of surrounding area; monitoring and adopting suitable measures for environment protection
- Implement EMP effectively to mitigate pollution of water, land, air, noise and dust and proper disposal of waste
- Develop green belt in available space
- Conserve natural resources and energy as far as possible
- If possible recycling of waste through the principles of 5Rs (reduce, reuse, recover, recycle, redesign), and
- Create environmental awareness among employees and local community through education and training

Corporate Social Responsibility (CSR) and community development

The company very well realizes that the ethical code of 21th century big business is not to make profit at the expense of the environment and the local community. And that the big business should not focus only on economically viable venture but also on environmentally and functionally sound, ecologically viable as well as socially sustainable venture.

CSR has become mandatory in many countries and it is also now an official policy of most big companies. Young Investment Group Industry Co., Ltd had already implemented CSR programmes as far as possible and will continue to do so and carry out community assistance and community development. Generous compensation would be provided if there is any loss or damage due to the implementation of this project. Moreover charity works and donation works had been carried out and this trend will be continued.

So far Young Investment Group Industry Co., Ltd spent more than Ks 70,100,000 for infrastructure development area plus assistance and donation in materials and kinds for CSR activities such as community development, charity works and donations.

This was done even before the project has commenced and before and profit is realized.

3.2 Environmental policy and legal frame work

3.2.1 Environmental policy

The environmental policy is to protect and conserve the environment while striving for national development. In other word to aim for sustainable development.

The National Environmental Policy of Myanmar (2019) is:

The policy provides the long terms strategic guidance for achieving a sustainable future for Myanmar.

In requires the mainstreaming of environmental protection into planning and decision making at all levels of government and in all sectors.

If detailed principle respective livelihood needs and development objectives, while the same time recognizing the full value of Myanmar's Ecosystems and implication of climate change.

This policy ensures that environmental protection continues to be a central objective in Myanmar's sustainable development pathway.

There were/are several laws or Acts since the colonial days which were/are in one way or another pertaining to the environmental and social elements of the country.

The conservation of the environment was/is one of the priorities of successive governments.

3.2.2 Applicable Laws and Rules

Young Investment Group Industry Co., Ltd will comply with the following laws, rules and regulation, and guidelines.

1. The Environmental Conservation Law, 2012
2. The Environmental Conservation Rules, 2014
3. Environmental Impacts Assessment (EIA) Procedures, 2015
4. National Environmental Quality (NEQ) Effluent Guidelines, 2015
5. Myanmar National Waste Management Strategy and Master Plan (2018-2030)
6. The Conservation of Water Resources and Rivers Law, 2006
7. The Conservation of Water Resources and Rivers Rule, 2013
8. The Forest Law, 2018
9. The Conservation of Biodiversity and Protected Areas Law, 2018

10. The Protection and Preservation of Ancient Monument Law, 2015
11. The Protection and Preservation of Antique Objects Law, 2015
12. Protection and Preservation of Cultural Heritage Regions Law, 2019
13. The Myanmar Investment Law, 2016
14. The Myanmar Investment Rules, 2017
15. Land Acquisition Act, 1894
16. The Factories Act, 1951
17. The Fire Brigade Law, 2015
18. The Electricity Law, 2014
19. The Private Industry Enterprise Law, 1990
20. The Myanmar Insurance Law, 1993
21. The Social Security Law, 2012
22. The Labour Organization Law, 2011
23. The Workmen's Compensation Act, 1923
24. The Leave and Holiday Act, 1951
25. Settlement of Labour Disputes Law, 2012
26. The Minimum Wages Law, 2013
27. The Public Health Law, 1972
28. The Occupational Health and Safety Law, 2019
29. The Export and Import Law, 2012
30. Highways Law, 2000
31. The Ethnic Rights Protection Law, 2015
32. The Ethnic Rights Protection Rules, 2019
33. Vehicle Safety and Motor Vehicle Management Law, 2020
34. Vehicle Safety and Motor Vehicle Management Rule, 2022
35. The Industrial Explosive Materials Law, 2018
36. The Petroleum and Petroleum Product law, 2017

37. The Petroleum Rules, 1937
38. Myanmar Engineering Council Law, 2013
39. Prevention of Hazard from Chemical and related Substances Law, 2013
40. Prevention of Hazard from Chemical Substances Rules, 2016
41. Prevention and Control of Communicable Diseases Law, 1995
42. The Control of Smoking and Consumption of Tobacco Product Law, 2016
43. Law Relating to Aquaculture, 1989
44. Fresh Water Fisheries Law, 1991
45. The related Law enacted by Mandalay Region Hluttaw and Rules issued by Mandalay Region Government

The above mentioned Laws, Rules, procedures and guidelines are directly or indirectly related to cement factory business. Since these laws cover a very wide spectrum and various aspects the company is not in a position to study all these law. The company has, therefore, hired a legal expert to deal expert to deal with the details of these laws.

When implementing the project the company authority will apply the common sense and simple logics not to pollute the air, water, land and the community. When it comes to detail the legal expert will assist the company to comply with these laws, accordingly.

However certain points or articles of relevant for laws are excerpted and reproduced as follow.

Sr. No.	Laws and Regulations	Relevant Articles	Commitments
1	The Environmental Conservation Law, 2012	Section-7 (o):	<p>Project Proponent has to compensate:</p> <p>for damages if the project will cause injuries to environment under the sub-section (o) of section-7</p> <p>Managing to cause the polluter to compensate for environmental impact, cause to contribute fund by the organizations which obtain benefit from the natural environmental service system, cause to contribute a part of the benefit from the businesses which explore, trade and use the natural resources in environmental conservation works;</p>
		Section-14:	<p>Project Proponent has to comply with the followings:</p> <p>A person causing a point source of pollution shall treat, emit, discharge and deposit the substances which cause pollution in the environment in accord with stipulated environmental quality standards.</p>
		Section-15:	<p>Project Proponent has to comply with the followings:</p> <p>The owner or occupier of any business, material or place which causes a point source of pollution shall install or use an on-site facility or controlling equipment in order to monitor, control, manage, reduce or eliminate environmental pollution. If it is impracticable, it shall be arranged to dispose the wastes in accord with environmentally sound methods.</p>

		Section-24:	Project Proponent has to comply with the term set up by the ministry: The Ministry may, in issuing the prior permission, stipulate terms and conditions relating to environmental conservation. It may conduct inspection whether or not it is performed in conformity with such terms and conditions or inform the relevant Government departments, Government organization to carry out inspections.
		Section-29:	Project Proponent has to comply with the followings directive: No one shall violate any prohibition contained in the rules, notification, orders, directives and procedures issued under this Law.
2	The Environmental Conservation Rules, 2014	Rules 56:	Project Proponent has to carry out: The person who carries out any project, business or activity shall arrange and carry out for conducting the EIA for any project, business or activity by qualified third person or organization accepted by the ministry (MONREC)
		Rules 69:	Project Proponent commits to comply with this rules: (a) Any person shall not emit, cause to emit, dispose, cause to dispose, pile and cause to pile, by any means, the pollutants and hazardous waste or hazardous materials stipulated by the notification under the law and any of these rules at any lace which may affect the public directly or indirectly. (b) Any person shall not carry out the action which can be damaged to natural environment which is changing due to ecosystem and such system, except the permission of the relevant Ministry in order to the interest of the public. The rules also set out further details on the requirement to conduct EIA and prepare EMP on the basic of EIA.

3	Environmental Impact Assessment Procedure, 2015	Paragraph -102:	<p>Project Proponent has to comply with:</p> <p>The project Proponent shall bear full legal and financial responsibility for:</p> <ul style="list-style-type: none"> (a) All of the Project Proponent’s actions and omissions and those of its contractors, subcontractors, officers, employees, agents, representatives, and consultants employed, hired, or authorized by the Project acting (b) PAPs until they have achieved socio-economic stability at a level not lower than that in effect prior to the commencement of the Project, and shall support programs for livelihood restoration and resettlement in consultation with the PAPs, related government agencies, and organizations and other concerned persons for all Adverse Impacts.
		Paragraph-103:	<p>Project Proponent has to comply with:</p> <p>The project proponent shall fully implement the EMP, all project commitments, and conditions and is liable to ensure that all contractors and subcontractors of the project comply fully with all applicable laws, the rules, this procedure, the EMP, project commitments and condition when providing services to the project.</p>
		Paragraph-104:	<p>Project Proponent has to comply with:</p> <p>The project proponent shall be responsible for and shall fully and effectively implement, all requirements set forth in ECC, applicable laws, the rules, this procedure and standards.</p>
		Paragraph-105:	<p>Project Proponent has to comply with:</p> <p>The project proponent shall timely notify and identify in writing to the ministry, providing detailed information as the proposed project's potential adverse impacts.</p>

		Paragraph-106:	<p>Project Proponent has to comply with:</p> <p>The project proponent shall, during all phase of the project (Preconstruction, Construction, Operation, Decommissioning, Closure and Post-closure) engage in continuous, proactive and comprehensive self-monitoring of the project and activities related thereto, all adverse impacts, and compliance with applicable laws, the rules, this procedure, standards, the ECC and the EMP.</p>
		Paragraph-107:	<p>Project Proponent has to comply with:</p> <p>The project proponent shall notify and identify in writing to the ministry any breaches of its obligations or other performance failures or violations of the ECC and the EMP as soon as reasonably possible and in any event, in respect of any breach which would have a serious impact or where the urgent attention of the ministry is or may be required, within not later than twenty-four (24) hours, and in all cases within seven (7) days the project proponent becoming aware of such accidents.</p>
		Paragraph-108:	<p>Project Proponent has to comply with:</p> <p>The project proponent shall submit monitoring reports to the ministry not less frequently than every six (6) months, as provided in a schedule in the EMP, or periodically as prescribed by the ministry.</p>
		Paragraph-109:	<p>Project Proponent has to comply with:</p> <p>The monitoring reports shall include:</p> <ul style="list-style-type: none"> a) Documentation of compliance with all conditions b) Progress made to date on implementation of the EMP against the submitted implementation schedule

			<p>c) Difficulties encountered in implementing EMP and recommendations for remedying those difficulties and steps proposed to prevent or avoid similar future difficulties</p> <p>d) Number and type of non-compliance with the EMP and proposed remedial measures and timelines for completion of remediation</p> <p>e) Accidents or incidents relating to the occupational and community health and safety, and the environment, and</p> <p>f) Monitoring data of environmental parameters and conditions as committed in the EMP or otherwise required.</p>
		Paragraph-110:	<p>Project Proponent has to comply with:</p> <p>Within ten(10) days of completing a monitoring report as contemplated in Article 108 and Article 109 in accordance with the EMP schedule, the Project Proponent shall make such report (except as relate to National Security concerns) publicly available on the Project's website, at public meeting places (e.g libraries, community halls) and at the Project offices. Any organization or person may request a digital copy of a monitoring report and the Project shall, with ten (10) days of receiving such request, submit a digital copy via email or as may otherwise be agreed upon with the requestor.</p>
		Paragraph-113:	<p>Project Proponent has to comply with:</p> <p>For purpose of monitoring and inspection, the Project Proponent:</p> <p>(a) Shall grant to the Ministry and/or its representatives, at any time during normal working hours, access to the Project's offices and to the Project site and any other location at which the Project activities or activities related to the Project are performed; and</p>

			(b) From time to time as and when the Ministry may reasonably require, shall grant the Ministry access to the Project's offices and to the Project site and any other location at which the Project activities or activities related to the Project are performed.
		Paragraph-115:	Project Proponent has to comply with: In the event of an emergency, or where, in the opinion of the Ministry, there is or may exist a violation or risk of violation of the compliance by the Project with all applicable environmental and social requirements, the Project shall grant full and immediate access to the Ministry at any time as may be required by the Ministry.
		Paragraph-117:	Project Proponent has to comply with: The Project Proponent shall further ensure that the Ministry's rights of access hereunder shall extend to access by the Ministry to the Project's contractors and information storage, and persons.
4	National Environmental Quality (Emission) Guideline, 2015		Project Proponent has to comply with: All the guidelines that are of relevance for this project are shown under a separate section of this report.
5	National Waste Management Strategy and Action Plan, 2018-2030		Project Proponent has to comply with: In addition the company will follow the National Waste Management Strategy and Action Plan.
6	The Conservation of Water Resources and Rivers Law, 2006		Project Proponent has to comply with this law: Objectives - To conserve and protect water resources and rivers for use by the public and to protect - To protect environmental impacts on water environment.

			<p>Mining/quarry in or near water course</p> <ul style="list-style-type: none"> - Anyone wanting to do the activity for commercial purpose near the water course must seek permission from the Directorate of Water Resource and Improvement of River System, Ministry of Transport (Art. 13) - Prohibits discarding engine oil, chemical or poisonous materials which may effect the environment (Art. 11)
		Section-8:	<p>Project Proponent has to comply with:</p> <p>No person shall:</p> <p>(a) Carry out any act or channel shifting with the aim to ruin the water resources and river and creeks.</p>
		Section-11:	<p>Project Proponent has to comply with:</p> <p>No person shall:</p> <p>(a) Dispose of engine, oil, chemical, poisonous material and other materials which may cause environmental damage, or dispose of explosives from the bank or from a vessel which is plying, vessel which has berthed, anchored, stranded or sunk.</p>
		Section-19:	<p>Project Proponent has to comply with:</p> <p>No one shall dispose of any substance into the river, creek that may cause damage to water way or change of water course from the bank or vessel which is plying, vessel which has berthed, anchored, stranded or sunk</p>
		Section-21:	<p>Project Proponent has to apply for permission:</p> <p>(b) drill well or pond or dig earth without the permission of the Directorate.</p>

		Section-22:	Project Proponent has to comply with: No one shall, without the permission of the Directorate, pile sand, shingle and other heavy materials for business purpose on the bank area and water front area.
		Section-24:	Project Proponent has to comply with: No one shall: (b) violate the conditions prescribed by the Directorate so as not to cause water pollution and change of watercourse in rivers and creeks.
		Section-30:	Project Proponent has to comply with this approval: Any government department and organization or any person desirous of constructing drainage, utilizing river water intake, constructing bridged spanning rivers, connecting underground pipe, connecting underground electric cables, connecting underground telecom cable or digging in river or creeks, bank boundary and water front boundary, under the requirement of work, shall in order not to adversely affect the water resources and river and creeks, carry out only after obtaining the approval of the Ministry of Transport.
7	The Conservation of Water Resources and Rivers Rule, 2013	Section-8:	Project Proponent commits to: <u>Chapter-3, Protection of water pollution and conservation of environment</u> No one: (a) must not pollute the river water by dumping hazardous substance into the water (b) must not dump plastic bags, any plastic materials or nylon ropes into the water

			<p>(c) must not construct latrine by the river side to prevent water pollution by human wastes</p> <p>(d) must not dump any human wastes, fuel oils, chemical toxic wastes into the water</p> <p>(e) all activities should be executed according to international standards</p>
		Section-9:	<p>Project Proponent commits to:</p> <p>Any one who has committed such an offence must pay for this to the Directorate</p>
		Section-53:	<p>Project Proponent commits to:</p> <p><u>Chapter-11, Construction of buildings/structures on the river bank premise</u></p> <p>Any one who want to construct any buildings or structures near the river must obtain permit from the relevant Ministry and Directorate.</p>
8	The Forest Law, 2018	Section-12:	<p>Project Proponent has to apply for approval:</p> <p>Whoever, within a forest land and forest covered land at the disposal of the Government:</p> <p>(a) is desirous of carrying out any development work or economic scheme shall obtain the prior approval of the Ministry (of Natural Resources and Environmental Conservation);</p>
9	The Conservation of Biodiversity and Protected Areas Law, 2018	Section-21:	<p>Project Proponent has to comply with:</p> <p>The Director General may, with the approval of the Minister:</p> <p>(b) allow person who has been permitted to conduct research to collect, transport and possess protected wild plants from the Protected Areas by an individual for the purpose of scientific research including experiment and reproduction.</p>

		Section-29:	<p>Project Proponent has to comply with:</p> <p>With the approval of the Ministry, the Director General:</p> <ul style="list-style-type: none"> (a) shall check whether the licence application for a zoological garden or botanical garden conforms with the specified terms and conditions, and issue a licence if the conditions are met; (b) may withdraw a licence within the prescribed period or cancel it if a person who receives a licence violates the prescribed terms and conditions.
		Section-35:	<p>Project Proponent has to pay:</p> <p>A park warden may pass an administrative order against any person to pay a fine from a minimum kyats 30,000 to a maximum kyats 100,000 if he commits any of the following acts within a protected area or a zoological garden or botanical garden which is administered by the Government or in which the Government has subscribed share capital:</p> <ul style="list-style-type: none"> (a) entering a prohibited area without permission; (c) digging on the land, cultivating or carrying out any activity; (d) extracting, collecting or destroying in any manner, any kind of wild flora or cultivated plant.
		Section-39:	<p>Project Proponent has to pay:</p> <p>Whoever commits any of the following acts shall, on conviction, be punished with imprisonment for a term not exceeding 3 years or with a fine from a minimum of kyats 200,000 to a maximum of kyats 500,000, or with both:</p> <ul style="list-style-type: none"> (c) commercially breeding protected endangered wild fauna without permission;

10	Protection and Preservation of Ancient Monuments Law, 2015	Section-12:	<p>Project Proponent has to comply with:</p> <p>Anyone who has found an ancient building of 100 years or more of age without owner on the ground, underground above the water or under the water has to inform, if the building is recognized as or believed to be an ancient monument , the nearest village or township administration department.</p>
		Section-15:	<p>Project Proponent has to comply with:</p> <p>Every person desirous to engage in the following within the area of certain ancient monuments has to apply for the permission of the administration department:</p> <p>(b) Constructing industrial building</p> <p>(e) Digging a well, pond</p> <p>(h) Constructing buildings near an ancient monument if this violets the structural rules approved by the ministry.</p> <p>The administration development can approve or reject an application submitted under section 14 or 15 after having analyzed it.</p>
		Section-20:	<p>Project Proponent has to comply with:</p> <p>No one is allowed to do any of the following acts likely to cause damage to an ancient monument within the boundary without prior written permission of the administration department</p> <p>(b) Using and driving heavy machines and vehicles which may cause vibration within the area of an ancient monument</p> <p>(f) Releasing of chemical waste which can cause pollution of ancient monument and the natural environment</p>

11	Protection and Preservation of Antique Objects Law, 2015	Section-12:	<p>Project Proponent has to comply with:</p> <p>A person who finds any object which has no owner or custodian shall promptly inform the relevant Ward or Village-Tract Administration if he known or it seems reasonable to assume that the said object is an antique object.</p>
12	Protection and Preservation of Cultural Heritage Regions Law, 2019	Section-13:	<p>Project Proponent has to comply with:</p> <p>A person desirous of carrying out one of the following shall abide by the provisions of other existing laws and also apply to the Department in accordance with stipulation to obtain prior permission under this law:-</p> <p>(a) Within the ancient monumental zone or the ancient site zone</p> <ol style="list-style-type: none"> (1) Construction or extending a building (2) Renovating the ancient monument or extending the boundary of its enclosure; <p>(b) Within the preserved or protected zone, constructing extending, renovating a hotel, motel, guest house, lodging house or industrial building or extending the boundary of its enclosure</p> <p>(c) Within the culture heritage region:</p> <ol style="list-style-type: none"> (1) Carrying out the renovation and maintenance work of the ancient monument without altering the original ancient form and structure or original workmanship; (2) Carrying out archeological excavations; (3) Broad, constructing bridge, irrigation canal and embankment or extending the same

		Section-21:	Project Proponent has to pay: No person shall, without prior permission granted under this Law, carry out an-of the following in the cultural heritage region. (b) carrying out archeological excavation.
		Section-22:	Project Proponent has to pay: No person shall construct a building which is not in conformity with the conditions prescribed region wise by The Ministry of Culture in the cultural heritage region.
13	The Myanmar Investment Law, 2016		Project Proponent has to pay: The Myanmar Investment Law and Rules cover all investment in Myanmar and clearly states that the country is to attract "responsible investment business which do not cause harm to the natural environment and the society for the benefit of the Union and its citizens.
		Section-50:	Project Proponent has to pay: (a) An investor who obtains permit or endorsement under this Law has the right to obtain a long-term lease of land or building from the owner if it is private land or building, or from the relevant government departments or government organizations if it is land managed by the Government, or land or building owned by the Union in accordance with the stipulations in order to do investment. Citizen investors may invest in their own land or building in accordance with the relevant laws. (b) Foreign investor may lease land or building either from the government or government organizations or from owners of private land or building from commencing on the date of receipt

			<p>of the permit or endorsement of the Commission up to an initial period of (50) year in accordance with the stipulation.</p> <p>(c) After the expiry of the term of the right to use land or building or the period of right to lease of land or building permitted under subsection (b), a consecutive period of (10) year and a further consecutive period of (10) year extension to such period of lease of land or building may be obtained with the approval of the Commission.</p> <p>(d) The investor shall register the land lease contract at the Office of Registry of Deeds in accordance with the Registration Act.</p> <p>(e) The Government may grant more favorable terms and conditions for the lease of land and the use of land by Myanmar citizen investors.</p> <p>(f) The Commission shall obtain the approval of the Pyidaungsu Hluttaw through the Government, when granting an extension to investors for the rights to lease land or building and the rights to use the land or building in this Law, in less-developed and remote region for the purpose of the development around the Union.</p>
		Section-51:	<p>Project Proponent has to comply with:</p> <p>The investor:</p> <p>(a) May appoint any citizen who is a qualified person as senior manager, technical and operational expert, and advisor in his investment within the union in accordance with the law.</p> <p>(b) The investor shall appoint them to replace, after providing for capacity building programs in order to be able to appoint citizens to different level positions of management, technical and operational experts and advisors,</p>

			<p>(c) shall appoint only citizens for works which does not require skill</p> <p>(d) shall appoint skilled citizen and foreign workers, technicians, and staff by signing an employment contract between employer and employee in accordance with the labor laws and rules;</p> <p>(e) shall ensure to obtain the entitlements and rights in the labor laws and rules, including minimum wages and salary, leave, holiday, overtime fee, damages, compensation of the workman, social welfare, and other insurance relating to workers in stipulating the rights and duties of employers and employees and occupational terms and conditions in the employment contract;</p> <p>(f) shall settle disputes arising among employers, among workers, between employers and workers, and technicians or staff in the investment in accordance with the applicable laws.</p>
		Section-65	<p>Project Proponent has to comply with:</p> <p>(a) shall respect and comply with the customs, traditions and traditional culture of the ethnic groups in the Union;</p> <p>(b) shall establish and register a company or sole proprietorship or legal entities or branches of such entities under the laws in order to invest;</p> <p>(c) shall abide by the terms and conditions, stipulations of special licenses, permits, and business operation certificates issued to them, including the rules, notifications, orders, and directives and procedures issued by this Law and the applicable laws, terms and conditions of contract and tax obligations;</p> <p>(d) shall carry out in accordance with the stipulations of the relevant department if it is, by the nature of business or by other need,</p>

			<p>required to obtain any license or permit from the relevant Union Ministries, government departments and government organizations, or to carry out registration;</p> <p>(e) shall immediately inform to the Commission if it is found that natural mineral resources or antique objects and treasure trove are not related to the investment permitted above and under the land on which the investor is entitled to lease or use and not included in the original contracts. If the Commission allows, the investor shall continue to carry out the investment in such land, and if not allowed, the investor shall transfer and carry out, by obtaining the permission, at the substituted place which is selected and submitted by him;</p> <p>(f) Shall not make any significant alternation of topography or elevation of the land on which he is entitled to lease or to use, without the approval of the commission.</p> <p>(g) Shall abide by applicable laws, rules, procedures and best standards practiced internationally for this investment so as not to cause damage, pollution, and loss to the natural and social environment and not to cause damage to cultural heritage;</p> <p>(i) Shall close and discontinue the investment only after payment of compensation to employees in accordance with applicable laws for any breach of employment contracts, closure of investment, sale and transfer of investment, discontinuation of investment, or reduction of workforce;</p> <p>(j) Shall pay wages and salaries to employees in accordance with applicable laws, rules, procedures, directives and so forth during the period of suspension of investment for a credible reason;</p>
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			<p>(k) Shall pay compensation and indemnification in accordance with applicable laws to the relevant employee or his successor for injury, disability, disease and death due to the work;</p> <p>(l) Shall supervise foreign experts, supervisors and their families, who employ in their investment, to abide by the applicable laws, rules, orders and directives, and the culture and traditions of Myanmar;</p> <p>(m) Shall respect and comply with the labor laws;</p> <p>(o) Shall pay effective compensation for loss incurred to the victim, if there are damage to the natural environment and socioeconomic losses caused by logging or extraction of natural resources which are not related to the scope of the permissible investment, except from carrying out the activities required to conduct investment in a permit or an endorsement.</p> <p>(p) Shall allow the Commission to inspect in any places, when the Commission informs the prior notice to inspect the investment;</p> <p>(q) Shall take in advance permit or endorsement of the Commission for the investments which need to obtain prior approval under the Environmental Conservation Law and the procedures of environmental impact assessment, before undertaking the assessment, and shall submit the situation of environmental and social impact assessment to the Commission along the period of activities of the investments which obtained permit or endorsement of the Commission.</p>
		Section-66:	<p>Project Proponent has to comply with:</p> <p>Subject to the assessment under section 65 (q), the Commission may administer the investments to carry out necessary, including to conduct or suspend.</p>

		Section-73:	Project Proponent has to comply with: The investor shall insure the types of insurance stipulated in the provision of the rules at any insurance enterprise which is entitled to carry out insurance businesses within the Union.
14	The Myanmar Investment Rules, 2017	Rule-190	Project Proponent has to carry out: An Investor to whom section 65(q) of the Law applies shall Submit confirmation of its compliance with the applicable requirements of the Environmental Conservation Law, rules and environmental impact assessment procedures to undertake, obtain and implement an initial environmental examination, assessment, certificate and management plan as those requirements are met. The approval of the Commission for continuation of the Investment shall base on its compliance.
		Rule-202:	Project Proponent has to comply with: The Investor must comply with the conditions of the Permit and other applicable laws when making an Investment.
		Rule-203:	Project Proponent has to comply with: The investor shall fully assist the negotiating processes with the relevant government departments and government organizations for the affected persons due to investment plans.
		Rule-206:	Project Proponent has to comply with : If the Investor is desirous to appoint a foreigner as senior management, technician expert or consultant according to section 51(a) of the law, it shall submit such foreigner's passport, expertise evidence or degree and profile to the Commission Office for approval.

		Rule-212:	<p>Project Proponent has to carry out: Every Investor that holds the Permit or Tax Incentives must have taken out the relevant insurance out of the following types of insurance at any insurance business that holds the license in the Union based on the nature of the business:</p> <ul style="list-style-type: none"> (a) Property and Business Interruption Insurance; (b) Engineering Insurance; (c) Professional Liability Insurance; (d) Professional Accident Insurance; (e) Marine Insurance; and (f) Workmen Compensation Insurance.
15	Land Acquisition Act, 1894		<p>Project Proponent has to pay: A company may carry out land acquisition when it is "likely to prove useful to the public".</p> <ul style="list-style-type: none"> - The company acquiring the land has to provide the compensation. Compensation is based on the market value of the land and also possible damage incurred by the private land owner, such as loss of crops and firewood or the cost of changing residence and place of business. (Art. 6)
16	The Factories Act, 1951		<p>Project Proponent has to comply with: Purpose: to ensure the health, safety, welfare, fair working time the clean environment for the employees working inside a factory. This law focuses on all stipulation for the employer (project owner). The project owner should abide by nearly all sections in this Act. The project owner has to abide by all provisions for healthy, safety, welfare, working-hours and other needs. The project owner shall ask its legal expert to study this Act in details for his advice.</p>

			<p>This Act also contains the provision for chemicals management and storage. The chemicals use in the manufacturing of motorcycle, paints, thinners, varnishes etc, may not require permits. Since iron smelting will not be involved permit for "hot work" may not be also necessary.</p> <p>This factories Acts requires all factories to have proper pollution control measures such as air pollution, sewage and waste water treatment system and solid waste management system.</p>
17	The Fire Brigade Law, 2015	Section-24:	<p>Project Proponent has to comply with:</p> <p>No person shall fail to abide by the directives in respect of fire precaution and prevention issued under section -16 by the Township Fire Service Department.</p>
		Section-25:	<p>Project Proponent has to comply with:</p> <p>No person shall fail to abide by the directives in respect of fire precaution and prevention issued under section -16 by the Township Fire Service Department.</p> <p>The owner or manager of the factory, workshop, bus terminal, airport, port, hotel, motel, lodgings, condominium, market, department, organization or business exposed to fire hazard shall, in accord with the directive of the Department of Fire Services:</p> <ul style="list-style-type: none"> (a) not fail to form the Reserve Fire Brigade; (b) not fail to provide fire safety equipment.
18	The Electricity Law, 2014	Section-10:	<p>Project Proponent has to comply with:</p> <p>When engaging in electricity activities, the ministry, the relevant region or state government and the head ("oozi") of the relevant self-administered division or self-administered zone –</p>

			(b) shall carry out an environmental impact assessment (EIA) in order to minimize the impact on the environment in accordance with the provisions stipulated in the Environmental Conservation Law. They shall pay compensation for the impact and contribute to the environmental conservation fund. Private entrepreneurs holding a license must also comply with these points
		Section-18:	Project Proponent has to comply with: The license holder has the right to engage in electric power generation and distribution only after having received the electrical hazards safety certificate from the chief inspector.
		Section-20:	Project Proponent has to comply with: The license holder must abide by the rules, regulations, notifications, orders, directives and procedures issued by the relevant ministry relating to the licensed electricity activities.
		Section-21:	Project Proponent has to comply with: (a) The license holder shall, if he fails to comply with the law, rules, regulations, procedures, orders and directions or the specified quality, standards and norms, be responsible in accordance with the law if any person or organization is affected or suffers a loss as a result.
		Section-24:	Project Proponent has to compensate: A power consumer must, if damage or loss occurs to other electric power consumers or any electricity activities due to his negligence, pay compensation calculated in accordance with the specified method of the ministry.

		Section-26:	Project Proponent has to comply with: The license holder must comply with the following- (a) Electricity exploration must be done in accordance with the law; (b) In electric power generation, transmission and distribution- (1) Electrical power must be generated as specified in the license; (2) Instruments for measuring electric power and protective equipment must be systematically used and maintained in accordance with the stipulations.
		Section-27:	Project Proponent has to comply with: The license holder and the authorized person must inform the chief inspector and the relevant department in charge immediately if an electrical hazard has accidentally occurred when generating, transmitting, distributing or consuming electric power.
		Section-29:	Project Proponent has to comply with: The relevant ministry must inspect quality and norm specifications relating to factories and workshops, machineries and equipment installed in such factories and workshops, commercial buildings, imported electrical appliances and equipment which are sold locally.
		Section-33:	Project Proponent has to comply with: The chief inspector, the inspector and the persons assigned by them, shall have the right to enter into any place and any building in the performance of their duties.
		Section-40:	Project Proponent has to comply with: The license holders comply with the rules, norms and procedures issued by the ministry and must accept necessary inspections by the relevant government departments and organizations.

		Section-68:	<p>Project Proponent has to comply with:</p> <p>If the negligence or irresponsibility of the license holder or of persons assigned by him has caused injury, disability or death by electrocution or fire, the aggrieved person has the right to request compensation from the license holder as follows-</p> <p>(a) If the aggrieved person is entitled to compensation according to the existing labour compensation law, the compensation specified in this law;</p> <p>(b) If the aggrieved person is not entitled to compensation according to the existing labour compensation law, the compensation specified in the rules, issued under this law</p>
19	The Private Industry Enterprise Law, 1990	Section -4:	<p>Project Proponent has to comply with:</p> <p>(a) Any person desirous of conducting any private industrial enterprise;</p> <p>(b) Any person conducting any private industrial enterprise on the day this Law is enacted; by using any type of power which is three horsepower and above or manpower of ten wage-earning workers and above shall register under this Law.</p>
		Section -11:	<p>Project Proponent has to comply with:</p> <p>(d) supervising to ensure the compliance by the entrepreneurs in the conducting of the industrial enterprises in accordance with the basic principles;</p>
		Section -13:	<p>Project Proponent has to comply with:</p> <p>The duties of the entrepreneur are as follows:-</p> <p>(a) Shall pay the registration fees, fees for the renewal of registration and other payable duties and taxes prescribed by the Directorate;</p>

			<p>(b) Shall abide by the terms and conditions of the registration certificate;</p> <p>(c) Shall conduct the enterprise by opening an account with the relevant bank in the name of its registered enterprise;</p> <p>(f) Shall shift the place of enterprise, change the nature of enterprise, amalgamate enterprises and split up enterprises only with the approval of the Directorate;</p> <p>(g) Shall abide by the orders and directives issued from time to time by the Ministry and the Directorate;</p> <p>(h) Shall also abide by the existing laws.</p>
		Section-15:	<p>Project Proponent has to comply with:</p> <p>The entrepreneur has the right to carry out the followings:-</p> <p>(a) appointing foreign experts and technicians with the approval of the Ministry;</p> <p>(b) carrying out change of the name of enterprise, transfer of ownership, temporary suspension or permanent closing down of the enterprise in the manner prescribed and with the approval of the Directorate.</p>
		Section-16:	<p>Project Proponent has to comply with:</p> <p>The Director General shall, in order that entrepreneurs may, have the right to enjoy, submit to the Private Industrial Enterprise Co-ordination Body and carry out in respect of the following matters:-</p> <p>(a) land, water, power, communication and transport et cetera required for use in his enterprise;</p> <p>(b) exemptions and reliefs from taxes;</p> <p>(c) loans for fixed capital and working capital;</p>

			<p>(d) raw materials, machinery and spare parts required locally and from abroad for his enterprise;</p> <p>(e) local and foreign technical know-how for enhanced production of goods and for improvement in the quality of finished goods;</p> <p>(f) to acquire local and foreign markets;</p> <p>(g) to acquire industrial areas and leased land for industrial enterprises.</p>
		Section-26:	<p>Project Proponent has to comply with:</p> <p>No one shall conduct a private industrial enterprise contained in section ~ without obtaining registration under this Law.</p>
		Section-27:	<p>Project Proponent has to comply with:</p> <p>An entrepreneur:</p> <p>(a) In distributing and selling the goods he has produced shall not sell without a trade mark;</p> <p>(b) Shall not violate any provision of section 13;</p> <p>(c) Shall not fail to comply with any order or decision passed by the Minister and the Director General.</p>
		Section-28:	<p>Project Proponent has to pay:</p> <p>Whoever violates the provision of section 26 shall, on conviction:-</p> <p>(a) in the case of conducting a small scale private industrial enterprise, he punished with fine which may extend from a minimum of kyats 5,000 to a maximum of kyats 10,000;</p> <p>(b) in the case of conducting a medium scale private industrial enterprise, he punished with fine which may extend from a minimum of kyats 10,000 to a maximum of kyats 20,000:</p> <p>(c) in the case of conducting a large scale private industrial enterprise be punished with fine which may extend from a minimum of kyats 20,000 to a maximum of kyats 50,000.</p>

		Section-29:	<p>Project Proponent has to pay:</p> <p>If a person who is convicted of an offence under Section 28 continues in the commission of such offence, he shall be punished with fine at the following rate for each day of the extent of the period of continuance thereof: -</p> <p>(a) in the case of a small scale private industrial enterprise, at the rate of kyats 100:</p> <p>(b) in the case of a medium scale private industrial enterprise, at the rate of kyats 150:</p> <p>(c) in the case of a large scale private industrial enterprise, at the rate -. of kyats 200.</p>
20	The Myanmar Insurance Law, 199	Section-15:	<p>Project Proponent has to comply with:</p> <p>Owner of motor vehicles shall effect life insurance for a minor</p>
		Section-16:	<p>Project Proponent has to comply with:</p> <p>An entrepreneur or organization operating an enterprise which may cause loss to state-owned property or which may cause damage to the life and property of the public or which may cause pollution to the environment shall effect compulsory General Liability Insurance with the Myanmar Insurance.</p>
21	Social Security Law, 2012	Section-11:	<p>Project Proponent has to comply with:</p> <p>(a) The following establishments shall be applied with the provisions for compulsory registration for social security system and benefits contained in this Law if they employ minimum number of workers and above determined by the Ministry of Labour in co-ordination with the Social Security Board:</p>

			<ul style="list-style-type: none"> (i) production industries doing business whether or not they utilize mechanical power or a certain kind of power, works of production, repairing or services, or engineering works, mills, warehouses, establishments; (ii) Government departments, Government organizations and regional administrative organizations doing business; (iii) development organizations; (iv) financial organizations, (v) companies, associations, organizations and their subordinate departments and branch offices doing business; (vi) shops, commercial establishments, public entertaining establishments; (vii) Government departments and Government organizations doing business or transport businesses owned by regional administrative body, and transport businesses carried out with the permission of such department, body or in joint venture with such department or body; (viii) construction works carried out for a period of one year and above under employment agreement; (ix) works carried out with foreign investment or citizen investment or joint ventured businesses; (x) works relating to mining and gemstone contained in any existing law; (xi) works relating to petroleum and natural gas contained in any existing law; (xii) ports and out-ports contained in any existing law; (xiii) works and organizations carried out with freight handling workers;
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			<p>(xiv) Ministry of Labour and its subordinate departments and organizations;</p> <p>(xv) establishments determined by the Ministry of Labour from time to time, in co-ordination with the Social Security Board and with the approval of the Union Government; that they shall be applied with the provisions of compulsory registration for Social Security System and benefits contained in this Law</p> <p>(b) The project owner will register to the respective social security office.</p>
		Section-15:	<p>Project Proponent has to set up the fund:</p> <p>a) The following funds are included in the Social Security Fund:</p> <p>(i) health and social care fund;</p> <p>(ii) family assistance fund;</p> <p>(iii) invalidity benefit, superannuation pension benefit, and survivors' benefit fund;</p> <p>(iv) unemployment benefit fund;</p> <p>(v) other social security fund for social security system of compulsory registration and contribution specified by the Ministry of Labour, in co-ordination with the Social Security Board, according to clause (2) of subsection (e) of section 13;</p> <p>(vi) other social security fund specified as to which contribution may be paid after voluntary according to clause (2) of sub-section (e) of section 13;</p> <p>(vii) fund for Social Security Housing Plan;</p>

			b) The employers and workers of establishments shall pay contributions to the funds contained in clauses (1), (3),(4) and (5) of sub-section (a) after effecting compulsory registration.
		Section-18:	Project Proponent has to pay: (b) The employer shall deduct contributions to be paid by worker from his remuneration and pay to the social security fund together with contribution to be paid by him. The employer shall also bear the expenses for such contribution.
		Section-48:	Project Proponent has to pay: (b) The employers may effect insurance by registering voluntarily for insurance of the workers who are not applied to provisions of compulsory registration for employment injury benefit insurance system, by paying stipulated contribution to employment injury benefit insurance fund;
		Section-49:	Project Proponent has to comply with: (a) The employers and insured of establishments where the employer had registered compulsorily under sub-section (a) of section 48 or where the employer had registered voluntarily under sub-section (b) of section 48 who have paid contribution to employment- ent injury benefit fund shall not apply to the provisions contained in the Workmen's Compensa- tion Act in respect of the employment injury benefit. (b) The insured that has affected insurance for employment injury benefit under sub-sections (a) and (b) of section 48 shall only be entitled to employment injury benefits contained in this Law.

		Section-75	<p>Project Proponent has to comply with:</p> <p>The employer of establishments applied by this Law:</p> <p>(a) shall prepare and keep the following records and lists correctly and submit to the relevant township social security office in accord with the stipulations:</p> <ul style="list-style-type: none"> i) records and lists of workers' daily attendance; ii) records of appointing new worker, employing worker by changing of work, suspension from work, dismissal from work and resignation from work; iii) records of promotion and paying remuneration ; iv) records and lists of employers, managers, and administrators; and records of changes of them; <p>(b) shall inform the relevant township social security office if the following matters arise:</p> <ul style="list-style-type: none"> i) change in number of workers and address of establishment; ii) change of employer, change of business, suspension from work, and termination of work; iii) employment injury, employment death, and occupational diseases; <p>(c) shall produce work records and lists on requirement of inspection team or official assigned duty under this Law by the Social Security Head Office and various Regional Social Security Offices.</p>
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22	The Labour Organization Law, 2011	Section-17:	<p>Project Proponent has to comply with:</p> <p>The labour organization shall have the right to carry out freely in drawing up their constitution and rules, in electing their representatives, in organizing their administration and activities or in formulating their programmes the labour organization has the right to negotiate and settle with the employer if the workers are unable to obtain and enjoy the right of the workers contained in the labour laws and to submit demands to the employer claim in accord with the relevant law if the agreement cannot be reached.</p>
		Section-18:	<p>Project Proponent has to comply with:</p> <p>The labour organizations have the right to demand the relevant employer to re-appoint a worker if such worker is dismissed by the employer and if there is cause to believe that the reason of such dismissal were based on labour organization membership or activities, or were not in conformity with the labour law</p>
		Section-19:	<p>Project Proponent has to comply with:</p> <p>The labour organizations have the right to send representation to the Conciliation Body in settling the dispute between the employer and the worker. Similarly, they have the right send representatives to the Conciliation Tribunal formed with the representatives from the various levels of labour organization.</p>
		Section-20:	<p>Project Proponent has to comply with:</p> <p>In discussing with the Government the employer and the complaining workers in respect of workers' right or interests contained in the labour laws, the representative of the labour organization also have the right to participate and discuss.</p>

		Section-21:	Project Proponent has to comply with: The labour organizations have the right to participate in solving the collective bargains of the workers in accord with the labour laws.
		Section-22:	Project Proponent has to comply with: The labour organizations shall carry out peacefully in carrying out holding meetings, going on strike and carrying out other collective activities in accord with the procedure, regulations, by-law and any directives prescribed by the relevant labour Federation ship.
23	The Workmen's Compensation Act, 1923		Project Proponent has to comply with: It was/is an Act to provide for the payment by certain classes of employers to their workmen of compensation for injury by accidents. This law was amended in 2005 by chairman of the State Peace and Development Council. Since the rate in kyats for compensation during the 1920s are no longer applicable (workable) the rate for compensation are increased. The rate shall be according to the Notification by the existing Ministry of Labour. eg. fine which may extend to "Ks 100" is substituted by "Ks 10,000".
		Section-13:	Project Proponent has to comply with: Compensation shall be paid in line with the provision of the said law.
24	Leaves and Holiday Act, 1951		Project Proponent has to comply with: The law contains 18 sections and the purpose is for regulating the taking of leaves and holidays, covering the hours of work, weekly rest and paid leave. Three types of leaves, namely Earned leave, casual leave and leave on Medical Certificate are stipulated. The holidays during that period (the 1950s) include: Independence Day, Fullmoon of Tabaung, Thingyan, Burmese New Year, May Day,

			Full Moon of Kason, Resistance Day, beginning of Buddhist Lent, Martyrs' Day, End of Buddhist Lent, Full Moon of Tansaungmone, and National Day. One Islam Holiday and Hindu Holiday are official but are not written in the Act, but are notified in short advance.
25	The Settlement of Labour Dispute Law, 2012	Section-38:	Project Proponent has to comply with: No employer shall fail to negotiate and coordinate in respect of the complaint with the prescribed period without sufficient cause
		Section-39:	Project Proponent has to comply with: No employer shall alter the condition of service relating to workers concerned in such dispute at the consecutive period before commencing the dispute within the period under the investigation of the dispute before the Arbitration Body or Tribunal, to affect the interest of such workers immediately.
		Section-40:	Project Proponent has to comply with: No party shall proceed to lock-out or strike without accepting negotiation, conciliation and arbitration by Arbitration Body in accord with this law in respect of a dispute.
		Section-43:	Project Proponent has to comply with: No person shall fail to abide by or carry out any condition contained in agreement concluded before the Conciliation Body in respect of individual dispute or collective dispute.
		Section-51	Project Proponent has to comply with: If an employer in the course of settlement of dispute commits any action omission without sufficient case, which by causing reduction in production resulting so as to reduce the workers' benefits shall be

			liable to pay full compensation in the amount determined by the Arbitration Body or Tribunal. Such money shall be recovered as the arrear of land revenue.
24	The Minimum Wage Law, 2013	Section-12:	<p>Project Proponent has to comply with:</p> <p>The employer:</p> <ul style="list-style-type: none"> (a) Shall not pay wage to the worker less than the minimum wage stipulated under this Law; (b) May pay more than the minimum wage stipulated under this Law; (c) Shall not have the right to deduct any other wage except the wage for which it has the right to deduct as stipulated in the notification issued under this Law; (d) Shall pay the minimum wage to the workers working in the commercial, production and service business in cash. Moreover, if the specific benefits, interests or opportunities are to be paid, it may be paid in cash or partly in cash and partly in property, with prevailing regional price, jointly according to the desire of the worker; (e) In paying minimum wage to the workers working in the agricultural and livestock business, some cash and some property at prevailing regional price may be paid jointly according to local custom or desire of the majority of workers or collective agreement. Such payment shall be for any personal use and benefit of the worker and his family and the value shall also be considerable and fair.

		Section-13:	<p>Project Proponent has to comply with :</p> <p>The employer:</p> <ul style="list-style-type: none"> (a) Shall inform the workers the rates of minimum wage relating to the business among the rates of minimum wage stipulated under this Law and advertise it at the workplace to enable to be seen by the relevant workers; (b) Shall prepare and maintain the lists, schedules, documents and wages of the workers correctly; (c) Shall report the lists, schedules and documents prepared and maintained under sub-Section (b) to the relevant department in accord with the stipulations; (d) Shall accept the inspection when summoned by the inspection officer. Moreover, he shall produce the said lists and documents upon asking to submit; (e) Shall allow the entry and inspection of the inspection officer to the commercial, production and service businesses, agricultural and livestock breeding workplaces and give necessary assistances; (f) If the workers cannot work due to sickness, shall give them holiday for medical treatment in accord with the stipulations; (g) If the funeral matter of the member of the family of worker or his parent occurs, shall give holiday without deducting from the minimum wage, in accord with the stipulations.
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		Section-18:	<p>Project Proponent has to comply with:</p> <p>The inspection officer:</p> <ul style="list-style-type: none"> (a) Has the right to enter and inspect the relevant commercial, production and service workplaces, agricultural and livestock breeding workplaces and inspect whether or not they comply with and carry out in accord with the rules, notifications, orders, directives and procedures under this Law, whether or not the lists, schedules and documents, wages relating to the workers are prepared correctly, and whether or not such lists, schedules and documents are reported to the Department in accord with the stipulations; (b) May summon, inspect the relevant persons under the assignment of duty by the Department, asking and copying for the relevant lists, schedules and documents. (c) If there are outside workers at employer, has the right to inspect information relating to such outside workers, their names and addresses and the right to ask for and copy their lists and documents and lists relating to minimum wage; (d) In carrying out under sub-section (a), (b) and (c) relating to inspection, if required by the employer to produce the document, shall show the civil service identify card issued by the relevant department; (e) Report to the Department in accord with the stipulations relating to the finding under sub-sections (a), (b) and (c), and documents and papers called for.
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27	Public Health Law, 1972	Section-3:	Project Proponent has to comply with: The company shall cooperate with the authorized person or organization in line with the law and shall abide by any instruction or stipulation for public health.
		Section-5:	Project Proponent has to comply with: The company shall accept any inspection anytime and anywhere if it is needed.
28	The Occupational Safety and Health Law, 2019	Section-12:	Project Proponent has to comply with: The Employer shall, in accordance with the stipulations of the Ministry: (a) appoint the Person In-charge for Occupational Safety and Health to closely supervise safety and health of Workers in line with the type of Industry/Business; and (b) form the respective Occupational Safety and Health Committee in line with the type of Industry/Business comprising equal number of Employer and Worker representatives to become safe and healthy Workplace on condition that the number of Workers in his/her Industry/Business exceeds the number determined by the Ministry for that purpose. The Occupational Safety and Health of female Workers shall be considered according to the nature of Industry/Business when forming such Occupational Safety and Health Committee.
		Section-14:	Project Proponent has to comply with: Persons In-charge for Occupational Safety and Health shall comply with this Law and rules, orders, directives and procedures made under this Law to make the Workplace to be a safe Workplace that is good for health.

		Section-16:	<p>Project Proponent has to comply with:</p> <p>Inspection Officers shall enter the Workplaces to which this Law applies and inspect Occupational Safety and Health conditions and direct Employers for their compliance and report the findings to the Chief Inspection Officer.</p>
		Section-17:	<p>Project Proponent has to comply with:</p> <p>Inspection Officers have the powers to perform the following for Occupational Safety and Health in accordance with their codes of conduct:-</p> <ul style="list-style-type: none"> (a) the power to enter, inspect and inquire at any Workplaces related to this Law at any time by showing the Inspection Officer's identity without warrant; (b) the power to look at, make copies of and seize as evidence as required documents and records in connection with Workplaces and Processes; (c) the power to take photos and record videos in connection with Workplaces and Processes that may be harmful to Occupational Safety and Health; (d) the power to assess and measure and take records of the extent of impairment and duration caused to the environment of the Workplace due to loudness, light, heat, coldness, particles, gas and Hazardous Materials, and obtain the assistance of the expert in the relevant field of study if required; (e) the power to inquire of any person in the Workplace during working hours with the assistance of the Recognised Doctor to check any conditions that put or are likely to put Workers in contact with Occupational Disease; and

			(f) the power to require responsible persons at clinics or hospitals to deliver, with the stipulated security grade, medical treatment records of the Worker who is under treatment or information relating to death due to Occupational Accident or Occupational Disease, or autopsy results asked by the Department in the stipulated form.
		Section-18:	<p>Project Proponent has to comply with:</p> <p>Inspection Officers shall, with the approval of the Chief Inspection Officer, order the Employer to temporarily close a whole or part of the Workplace, and notify the relevant Departments if required, if they believe that an Occupational Accident, Occupational Disease, Hazardous Event or Major and Serious Occupational Accident occurs or is likely to occur because:</p> <p>(a) it is not appropriate to continue doing the Industry/Business due to dangerous Workplace condition, or unsafe operation carried by Workers, or existence of Hazardous Materials and Hazardous Machines, or layout and function of Workplace, part of the machine or equipment;</p> <p>(b) it is not appropriate to continue doing the Industry/Business due to breach or incompliance with any of the provisions of this Law;</p> <p>(c) it deems that Workers in the Workplace are in danger due to acts, omissions, negligence or carelessness; or</p> <p>(d) it needs to evacuate Workers from hazards because an Occupational Accident or accident is about to occur.</p>

		Section-26:	<p>Project Proponent has to comply with:</p> <p>The Employer shall be responsible to: -</p> <ul style="list-style-type: none"> (a) arrange as required to assess the risks of Workplace, Process and machines and materials used thereat; (b) arrange as required to assess the likelihood of occurrence of hazards at the Workplace and to the environment; (c) arrange to have Workers medical checked-up by the Recognized Doctor in accordance with stipulations whether they suffer from any Occupational Disease; (d) arrange to improve the Workplace until it is safe and good for health based on the findings as per sub-sections (a), (b) and (c) (e) provide Workers with sufficient number of personal protective clothing, materials and facilities prescribed and approved by the Department on free of charge basis and cause Workers to wear them while working; (f) prescribe precautionary plans and plans for emergency; (g) provide a clinic, appoint the Registered Doctors and nurses and provide medicines and supporting equipment for any Industry/Business where the number of Workers is not less than the number determined by the Ministry; (h) make necessary arrangements for managers, Workers and members of the Occupational Safety and Health Committee including (Employer) himself/herself to attend Occupational Safety and Health training courses stipulated by the Ministry in accordance with their departments or types of work;
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			<ul style="list-style-type: none"> (i) make necessary arrangements to enable immediate reporting to the Person In-charge for Occupational Safety and Health or manager in case where a Worker suffers an Occupational Accident or his/her life or health is likely to be in danger; (j) arrange to prevent any persons in the Workplace from Occupational Safety and Health risks occurred due to materials, machines or wastes used in the Workplace or Process; (k) immediately stop the Process, evacuate Workers and conduct necessary rescue plans if any Occupational Accident is about to occur. If possible, Workers will be relocated to another appropriate safe Workplaces; (l) display Occupational Safety and Health instructions, danger signs, notices, posters and signage for directions in accordance with stipulations; (m) arrange to be complied with precautions when entering restricted hazardous Workplaces; (n) arrange to disseminate Occupational Safety and Health manuals and guidelines issued by the relevant Ministries for knowledge, technology, information and skills not only to Workers but also to related persons or raise their awareness or knowledge thereof; (o) lay down the fire safety plan, perform fire drilling and train Workers to use fire extinguishers systematically; (p) allow the Chief Inspection Officer and Inspection Officers to enter Workplaces, inquire, request documents and information or seize exhibits; (q) cause Workers to work only for the specified working hours if they have to work in Hazardous Industry/Business and Workplace; and (r) Incur the expenses for Occupational Safety and Health matters.
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		Section-27:	<p>Project Proponent has to comply with:</p> <p>No Employer shall dismiss or demote a Worker: -</p> <ul style="list-style-type: none"> (a) during any period before a medical certificate is issued by the Registered Doctor for occupational injury or by the Recognized Doctor for contact with Occupational Disease; (b) because the said Worker has addressed a complaint for hazardous or health detrimental condition; (c) because the said Worker has conducted the responsibilities of Occupational Safety and Health Committee; or (d) because the said Worker has refused to work in any condition where an Occupational Accident or Occupational Disease is about to occur.
		Section-34:	<p>Project Proponent has to comply with:</p> <p>The Employer is responsible to undertake the following in accordance with the stipulations: -</p> <ul style="list-style-type: none"> (a) informing the Department in case of an Occupational Accident, Hazardous Event or Major and Serious Occupational Accident; (b) if a Worker is in contact with a stipulated Occupational Disease or contaminated or likely to be contaminated due to materials or Process used, sending a report to the Department together with a medical report prepared by the Recognized Doctor.
		Section-36:	<p>Project Proponent has to comply with:</p> <ul style="list-style-type: none"> (a) Inspection Officers must perform inspection as required if any Occupational Accident, Hazardous Event, Occupational Disease or Occupational Contamination breaks out.

			(b) No one shall, without consent of the Chief Inspection Officer, remove, conceal, add or change a whole or part of the materials, machines, equipment, layout, documents or signs relating to the occurrence of an Occupational Accident, Hazardous Event, Occupational Disease or Occupational Contamination.
28	The Export and Import Law, 2012	Section-6:	Project Proponent has to comply with: Without obtaining license, no person shall export or import the specific goods which is to obtain permission
		Section-7:	Project Proponent has to comply with: A person who obtain any license shall not violet the conditions contained in the license.
30	Highways Law, 2000	Section-7:	Project Proponent has to comply with: Whoever without the permission of the Public Works commits any of the following acts shall, on conviction, be punished with imprisonment for a term which may extend to 3 years or with fine or with both:- (b) constructing the building within the boundary of the highway
		Section-8:	Project Proponent commits: Whoever commits any of the following acts shall, on conviction, be punished with imprisonment for a term which may extend to months or with fine or with both:- (b) planting, cutting or destroying tree or crops within the boundary of the highway without permission of Public Works
		Section-9:	Project Proponent has to comply with: Whoever commits any of the following acts shall, on conviction, be punished with imprisonment for a term which may extend to 3 months or with fine or with both:-

			Setting up the signboard of advertisement within the boundary of high ways without permission of Public Works
31	The Ethnic Rights Protection Law, 2015	Section-5:	Project Proponent has to comply with: Ethnic people (ta-ne tain-yin-tha) should receive complete and precise information about extractive industry project and other business activities in their area before project implementation so that negotiation between groups and the Government/companies can take place.
		Section-25:	Project Proponent has to comply with: Whoever violates the prohibition in section (22) shall, on conviction, be punished with imprisonment for a term not exceeding one year or with a fine not exceeding one hundred thousand kyats or with both.
32	The Ethnic Rights Protection Rules, 2019	Rule-20:	Project Proponent has to comply with: The project proponent who will implement the project in the ethnic group area shall: (a) explain in details in local's language/dialect, in advance about the positive and negative effect of the project to the ethnic people in the local area. (b) comply with policy, strategy and action plan as prescribed in Myanmar Sustainable Development Plan (MSDP) (c) in order to know any impact on the physical and social environment, conduct Environmental and Social Impact Assessment (ESIA) in accordance with regulation. (d) all stages and activities of ESIA must be explained to and consulted with the ethnic group in a transparent manner

		Rule-21:	Project Proponent has to comply with: The proponent shall: (a) report in details about the project preparation works as mentioned in R-20 to the Ministry before implementation of the project and wait for approval from the Ministry. (b) after completion of project advance plan and project completion report must be submitted to the Ministry
33	Vehicle Safety and Motor Vehicle Management Law, 2020	Section-9:	Project Proponent has to comply with: The ministry must implement the following will the approval of the Union Government. (a) designate and restrict the areas for the movement of vehicles used inside the nation.
		Section-12:	Project Proponent has to comply with: The ministry shall: (c) as regards initial motor vehicle registration, must issue the safety and environmental regulation, and standards.
		Section-14:	Project Proponent has to comply with: The power and responsibilities of the Directorate are as follows: (r) must designate motor vehicle speed on the roads used by public.
		Section-18:	Project Proponent has to comply with: The motor vehicle owner: (a) must maintain the motor vehicle in accordance with the standards fixe by the Directorate for safety driving.
		Section-81:	Project Proponent has to comply with: (g) No one must not carry or transport dangerous goods without regulation or public areas.

34	Vehicle Safety and Motor Vehicle Management Rules, 2022		Project Proponent commits to comply with this rules: There are 16 chapters and 379 Rules in this Vehicle Safety and Motor Vehicle Management Rules, 2022. The project proponent will comply with this law; a leagl expert is hire to do all this works.
35	The Industrial Explosive Materials Law, 2018	Section-6:	Project Proponent has to comply with: (c) In accordance with Section 6 (a) the inspector General, after receiving the directives from the said Ministry, shall inform the applicant to build the magazine on the site approved by the chief of staff (Army) office. The magazine must comply with all requirements.
		Section-7:	Project Proponent has to comply with: (c) The chief of staff (Army) office shall examine the finding and comments, report submitted by "The Explosives Procurement, storage and distribution Sub-committee" whether it is in compliance with rules and regulations. The chief of staff (Army) office shall than issue a permit concerning the important, transport, storage, making, uses, possession, and transfer of one type or more than one type of explosives to the applicant. One copy of the permit must be sent to the Ministry.
		Section-11:	Project Proponent has to comply with: (b) The Ministry after finding that the magazine is in compliance with rules and regulations shall issue a license to the applicant.
		Section-13:	Project Proponent has to comply with: The license holder desirous of continual storage of explosives must apply to the Inspector General for extension of license 30 days before the end of the license period.

		Section-14:	Project Proponent has to comply with: (b) Upon finding that the application is in accordance with rules and regulations the Inspector General can extend the license with the approval of the Ministry.
		Section-15:	Project Proponent has to comply with: The license holder: (a) shall systematically store the explosives not more than the quantity approved. (b) must undergo the inspection by the Inspector General or inspection officer. (c) in case loss, burn, explosive, damage of explosives and injuries or deaths of people must promptly report to the nearest Police Station and inform the Inspector General at the same time. (d) must pay for the license to the Directorate office according the rate fixed by the Ministry.
		Section-16:	Project Proponent has to comply with: The license holder: (a) must store the explosives only in the licensed magazine. (b) must prepare in advance for the safety transportation, manufacturing, use and keeping of explosives according to rules and regulations.
		Section-18:	Project Proponent has to comply with: The license holder must not refuse the inspection by the Inspector General or inspection officer.

		Section-20:	Project Proponent has to comply with: No one must not: (a) receive and store explosives in unlicensed magazine. (b) must not entrust and store explosive in unlicensed magazine.
		Section-21:	Project Proponent has to comply with: No license holder: (a) must not keep and store explosives more than the quantity approved. (b) in accordance with Section-15, subsection (c) in case of accident the license holder must not fail to report promptly to the nearest police station and the Inspector General at the same time after the end of license period must not keep and store the explosives without extension of the license period.
36	The Petroleum and Petroleum Product Law, 2017	Section -9:	Project Proponent has to comply with: The Ministry of Transport and communications shall carry out the following functions relating to any petroleum and petroleum products. (a) Issuing license to vehicles, vessels and barges that carry any petroleum and petroleum product. (e) specifying the procedures and terms for transportation, except for transportation by pipelines.
		Section -10:	Project Proponent has to comply with: The ministry shall: (a) Issue licence for the right to store for the storage tanks and warehouses

			<p>(b) Issue transport permit for the vehicles, vessels and barges that shall carry any petroleum and petroleum product</p> <p>(d) If it occurs environmental impact, in carrying out petroleum and petroleum product business activities, taking action, as necessary in accordance with the existing laws of on-site inspection.</p>
		Section-11:	<p>Project Proponent has to comply with:</p> <p>On all receptacles containing any dangerous petroleum and petroleum product the warning sign of danger by stamping, embossing, painting, printing or any other means shall be expressed. If it is impossible to express as such, similar warning signs of the nature of danger of gasoline, spirit or petroleum shall be expressed in writing at the ostensible place in salient words or signs near the receptacle.</p>
		Section-31:	<p>Project Proponent has to comply with:</p> <p>Any license:</p> <p>(a) Shall not violate any prohibition contained in the rules, regulations, bye-laws, notifications, orders, directives, procedure and conditions or fail the duty to implement</p> <p>(c) Shall not import, transport, store, sell and distribute the dangerous petroleum and petroleum products or non-dangerous petroleum and petroleum product except by the means stipulated in the law</p> <p>(d) Shall not have the right to carry out without under taking the environmental impacts, in operating petroleum and petroleum product business activities.</p>

37	The Petroleum Rules, 1937	CHAPTER III Chapter III, Part I: Rule-24:	Project Proponent has to comply with: Prevention of accidents. — All due precautions shall be taken at all times to prevent accident by fire or explosion.
		Rule-25:	Project Proponent has to comply with: Prevention of escape of Petroleum. — All due precautions shall be taken at all times to prevent any escape of petroleum during transport especially into any drain, sewer, harbour, river or water course.
		Rule-26:	Project Proponent has to comply with: Empty receptacles. — All empty tanks or other receptacles which have contained class I petroleum or which have contained class II petroleum in bulk shall, except when they are opened for the purpose of cleaning them and rendering them free from petroleum vapour, be kept securely closed unless they have been thoroughly cleaned and freed from petroleum vapour.
		Part IV:Rule-63:	Project Proponent has to comply with: Prohibition of fires and smoking. — (1) No fire or other artificial light capable of igniting inflammable vapour shall be allowed on any vehicle containing petroleum in bulk. (2) No person shall smoke while on or attending such a vehicle. (3) No article or substance capable of causing fire or explosion shall be carried on such a vehicle. Explanation. — For the purposes of this rule any tank or other receptacle which has contained petroleum and which has not been thoroughly cleaned and freed from inflammable vapour shall be deemed to contain petroleum.

		Rule-64:	<p>Project Proponent has to comply with:</p> <p>Filling and discharge of tanks. —</p> <p>(1) Tank-wagons, lorries or carts transporting petroleum shall only be filled or discharged by means of metal pipes or armoured hose in which the armouring is electrically continuous throughout.</p> <p>(2) Tanks, other than fuel tanks on vehicles, containing Class - I petroleum shall not be filled or discharged—</p> <p>(i) within 30 meters of any fire, furnace or artificial light capable of igniting inflammable vapour ; or</p> <p>(ii) at any place where the lorry, wagon or cart is exposed to sparks:</p> <p>Provided that the distance specified in clause (i) may be reduced to 9 meters when the petroleum is filled or discharged under seal and closed vapour return pipe lines are provided:</p> <p>Provided further that the distance specified in clause (i) may be reduced to the figure 4 meters prescribed in the licence in Form K where the petroleum is filled, stored and discharged into a tank in any premises licensed in that Form.</p> <p>Explanation. — A pipe supplying liquid to a tank is “under seal” to the tank if it is screwed to the tank or otherwise attached so that no liquid or vapour can escape into the air except through an approved vent.</p>
		Rule-65:	<p>Project Proponent has to comply with:</p> <p>Means of extinguishing fire to be carried. — An adequate supply of dry sand or other efficient means of extinguishing fire shall be carried in an easily accessible position on every vehicle transporting petroleum in bulk by road.</p>

		Rule-66:	Project Proponent has to comply with: Prohibition as to public service vehicles. — Petroleum shall not be transported on any public vehicles which is carrying passengers.
		Rule-67:	Project Proponent has to comply with: Vehicles to be constantly attended. — (1) Every vehicle while engaged in the transport of petroleum by road shall be constantly attended by at least one person: Provided that such vehicles may be left unattended in places previously approved by the Chief Inspector. (2) Every vehicle on which more than 4,500 litres of petroleum is being transported by road, or which while transporting any petroleum by road is being trailed by another vehicle, shall so long as it is in motion, be attended by at least two persons.
		Rule-77:	Project Proponent has to comply with: Approval of vehicles for transport in bulk necessary. — (1) Petroleum in bulk shall not be transported by land except under a licence granted under these rule in a vehicle of a type approved in writing by the Chief Inspector. (2) All such vehicles other than those exclusively used for the transport of class III petroleum shall have a stamped, embossed, painted or printed warning exhibiting in conspicuous characters the words “Petrol”, “Motor Spirit”, “Kerosene” or an equivalent warning of the nature of the contents. (3) Every such vehicle and its fittings shall be maintained in good condition.

		<p>Chapter IV Storage of Petroleum Requiring License</p>	<p>Project Proponent has to comply with:</p> <p>91. Precautions against fire. –</p> <p>(1) No person shall smoke in any installation or storage shed.</p> <p>(2) No person shall carry matches, fuses or other appliance for producing ignition or explosion in any installation or storage shed which is used for the storage of dangerous petroleum.</p> <p>(3) No fire, furnace or other source of heat or light capable of igniting inflammable vapour shall be allowed in any licensed installation or storage shed save in places specially authorized by the licensing authority for the purpose.</p> <p>(4) An adequate supply of dry sand or earth together with the necessary implements for its convenient application, or other efficient means of extinguishing petroleum fires, shall always be kept in every installation and in or adjacent to every storage shed.</p> <p>95. Exclusion of unauthorized persons. –</p> <p>(1) Every installation shall be surrounded by a wall or fence of at least six feet in height:</p> <p>Provided that nothing in this sub-rule shall apply to an installation licensed under the rules in force immediately before these rules come into operation unless its fencing is considered by the licensing authority to be unsatisfactory:</p> <p>Provided further that the Chief Inspector may waive this sub-rule in the case of an installation connected with a pump outfit and floating storage barges, under such conditions as he deems necessary.</p> <p>(2) Precaution shall be taken to prevent unauthorized persons from having access to any storage shed or installation.</p>
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			<p>100. Construction of tank. – Every tank or other receptacle used for the storage of petroleum in bulk other than well-head tank shall be constructed of iron or steel properly erected and designed according to sound engineering practice and, together with all pipes and fittings shall be so constructed and maintained as to prevent any leakage of petroleum.</p> <p>102. Earthing of tanks. – All tanks or other receptacles for the storage of petroleum in bulk other than well-head tank or tanks for receptacles of less than 10,000 gallons capacity containing heavy petroleum shall be electrically connected with the earth in an efficient manner by means of not less than two separate and distinct connections placed at opposite extremities of such tank or receptacles. The roof and all metal connections of such tank or receptacle shall be in efficient electrical contact with the body of such tank or receptacle.</p>
38	Myanmar Engineering Council Law, 2013	Section-34:	<p>Project Proponent has to comply with:</p> <p>If, whoever has received a registration certificate, is found to have breached any rules contained in the registration certificate or violated any prohibition contained in a rule, order or directive enacted under this law or in any stipulation of the law, the executive committee may take the following administrative actions:-</p> <ul style="list-style-type: none"> (a) Giving a warning; (b) Assessing a suitable fine; (c) Suspending the registration certificate, (d) Cancelling the registration certificate.

		Section-37:	Project Proponent has to comply with: No one shall perform any engineering work and technological work which are specified as being dangerous to the public by a rule enacted under this law without having received a registration certificate issued by the Council, except engineers appointed in a government department or an organization in the performance of their duties.
39	Prevention of Hazard from Chemical and Related Substances Law, 2013	Section-14:	Project Proponent has to comply with: The Central Supervisory Board:- shall grant the licence with regulations, if permit to grant the licence, after being paid the licence fees.
		Section-15:	Project Proponent has to comply with: A person who has obtained a licence, before starting the respective chemical and related substances business:- (a) Shall be inspected for the safety and the power of resistance of the machinery and equipments by the respective Supervisory Board and Board of Inspection; (b) Shall be attended the person who serve in the work to the respective foreign trainings or the training and the expert trainings on prevention of hazard from the chemical and related substances opened by the government department and the government organizations.
		Section-16:	Project Proponent has to comply with: A person who has obtained a license:- (b) Shall perform to abide strictly the instructions for being safety in using the chemical and related substances by himself and also the persons who serve the work;

			<p>(c) Shall keep the required safety equipment enough in the chemical and related substances businesses, furthermore shall grant the personal protection equipment and dresses free of charge to the working persons;</p> <p>(d) Shall make the course of training and study and instruction if necessary to the working persons for using the occupational safety equipment, the personal protection equipment and the dresses systematically in the chemical and related substances business;</p> <p>(e) Shall be inspected by the respective Supervisory Board and Board of Inspection in respect of whether or not the hazard may impact on the Human Being and Animals' health and the environment;</p> <p>(f) Shall make medical checkup the working persons who will work in the chemical and related substances business and shall permit to serve in that work after obtaining the recommendation that his health is suitable for that work. This medical checkup records shall be kept systematically;</p> <p>(g) Shall send the copy of informative letter of the permission to the respective Department of Township Administration, if the hazardous chemical or related substances are permitted to store;</p> <p>(h) Shall acquire in advance the guidance and agreement of the respective Department of Fire Brigade, if the business that is worried to fire hazard is operated by using the fire hazard substances or the explosive substances;</p> <p>(i) Shall transport only the permitted amount of the chemical and related substances in accordance with the prescriptive stipulations, if they are transported in local;</p>
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			(j) Shall take the permission from the Central Supervisory Board if the chemical and related substance is altered and transferred from one place to any other place which contained in the license;
		Section-17:	Project Proponent has to comply with: A person who has obtained a license, shall put the insurance in accordance with prescriptive stipulations to be able to pay the compensation, if the impact and damage is occurred on the Human Being and Animals or the environment in respect of the chemical and related substances businesses.
		Section-20:	Project Proponent has to comply with: A person who has obtained a licence shall apply the related chemical and related substances that will be used in his chemical and related substances business in accordance with the stipulations to the Central Supervisory Board.
		Section-21:	Project Proponent has to comply with: The Central Supervisory Board scrutinizes the application according to section 20 and if it is in accord with the stipulations, shall issue the registration certificate with regulations after being paid the registration fees for the respective chemical and related substances.
		Section-22:	Project Proponent has to comply with: A person who has obtained the registration certificated shall abide the regulations consisted in the registration certificate furthermore shall also abide the order and instructions issued occasionally by the Central Supervisory Board.

		Section-23:	<p>Project Proponent has to comply with:</p> <p>A person who has obtained the registration certificate:-</p> <ul style="list-style-type: none"> (a) shall apply to register again, to the Central Supervisory Board if the chemical and related substances, which are not contained in the registered list, are used; (b) shall inform and submit the unused chemical and related substances list to the Central Supervisory Board, although which are contained in the registered list.
		Section-27:	<p>Project Proponent has to comply with:</p> <p>A person who has obtained the license to be complied the following matters to control and decrease the hazard of the chemical and related substances:-</p> <ul style="list-style-type: none"> (a) Classifying the hazard level to protect in advance the hazard according to the properties of the chemical and related substances; (b) Expressing the Material Safety Data Sheet and Pictogram; (c) Providing the safety equipment, the personal protection equipment to protect and decrease the accident and attending to the training to be used systematically; (d) Performing in accordance with the stipulations in respect of transporting, possessing, storing, using, discharging the chemical and related substances;
40	Prevention of Hazard from Chemical Substances Rules, 2016	Rule-24	<p>Project Proponent has to comply with:</p> <p>A licence holder shall:</p> <ul style="list-style-type: none"> (a) operate only chemical and related substances business which is permitted in licence; (b) operate it in accordance with the licence duration of registered substances;

			<p>(e) hang the licence at a conspicuous place in the occupational area</p> <p>(j) pack the chemical and related substances safely and carry out the sticking of pictogram on the package in accordance with the stipulations;</p>
41	Prevention and Control of Communicable Diseases Law, 1995	Section-3:	<p>Project Proponent has to comply with:</p> <p>In order to prevent the outbreak of Communicable Diseases the Department of Health shall implement the following project activities.</p> <p>(a) Immunization of children by injection or orally.</p> <p>(b) immunization of those who have attained majority, by injection or orally, when necessary;</p> <p>carrying out health educative activities relating to Communicable Disease.</p>
		Section-4:	<p>Project Proponent has to comply with:</p> <p>When a principal epidemic disease of a notifiable disease occurs:-</p> <p>(a) Immunization and other necessary measures shall be undertaken by the Department of Health, in order to control the spread thereof</p> <p>(b) The public shall abide by the measures undertaken by the Department of Health under sub-section (a)</p>
		Section-9:	<p>Project Proponent has to comply with:</p> <p>The head of the household or any member of the household shall report immediately to the nearest health department or hospital when any of the following events occur:-</p> <p>(a) Rat fall</p> <p>(b) Outbreak of a principal epidemic disease</p> <p>(c) Outbreak of a noticeable disease</p>

		Section-11:	<p>Project Proponent has to comply with:</p> <p>In order to prevent and control the spread of a principal disease the health officer may undertake the following measures:-</p> <ul style="list-style-type: none"> (a) Investigation of a patient or any other person required (b) Medical examination (c) Causing laboratory examination of stool, urine, sputum and blood sample to be carried out (d) Causing investigation by injection to be carried out (e) Carrying out any other investigation.
42	The Control of Smoking and Consumption of Tobacco Product Law, 2016	Section-9:	<p>Project Proponent has to comply with:</p> <p>The person in charge at the factory shall:-</p> <ul style="list-style-type: none"> (a) Keep the caption and mark referring that it is a non-smoking area the place mentioned.
		Section-6:	<p>Project Proponent has to comply with:</p> <p>In accordance with stipulation.</p> <ul style="list-style-type: none"> (b) Arrange the specific place where smoking is allowed as mentioned in section-7 and keep the caption and mark also referring that it is a specific place where smoking is allowed, in accordance with the stipulation (c) Supervise and carry out measures so that no one shall smoke at the non-smoking area. (d) Accept the inspection when the supervisory body comes to the place for which he is responsible.

43	The boiler Law, 2015	Section-5:	Project Proponent has to comply with: Any person desirous to use a boiler for any enterprise shall register under this law.
		Section-6:	Project Proponent has to comply with: A boiler shall be manufactured in accord with Myanmar standards and international standards.
		Section-7:	Project Proponent has to comply with: The documents and certificates relating to the boiler shall be attached to the application and submitted to the inspector when applying for the registration of the boiler under section-5.
		Section-12:	Project Proponent has to comply with: The owner shall: (a) Apply to the respective inspector to obtain certificates in accord with the prescribed manner. (b) Apply to register only for the boiler constructed in accord with Myanmar standards or international standards.
		Section-14:	Project Proponent has to comply with: The owner shall apply to the respective inspector in advance in order to obtain permission though he or she has obtained the certificate or the provisional order if desirous to carry out any of the following matters: (a) Using the boiler at more than allowable pressure (b) Repairing, altering adding or renewing any steam-pipe, pipe or any mounting or other fitting attached such steam pipe, feed-pipe or mounting or other fitting attached to the boiler.

		Section-15:	Project Proponent has to comply with: The owner shall submit the certificate or provisional order when so requested by the respective government department and organization as may be necessary.
		Section-18:	Project Proponent has to comply with: The owner shall inform immediately to the inspector if any accident occurs.
		Section-19:	Project Proponent has to comply with: The owner shall not: (a) use a boiler at a pressure higher than allowable pressure; (b) repair and alter or force to repair and alter the safety valve to exceed allowable pressure; do any act contained in sub-section (b) of section 14 without permission.
		Section-20:	Project Proponent has to comply with: The owner shall not use the following boiler: (a) Boiler without certificate or provisional order (b) Boiler of which certificate or provisional order is void (c) Boiler of which certificate or provisional order is revoked.
		Section-21:	Project Proponent has to comply with: The owner shall engrave the register number specified by the chief inspector in accord with the prescribed manner.
		Section-22:	Project Proponent has to comply with: The owner: (a) has the right to use a boiler in accord with the prescribed manner if he or she obtains certificate or provisional order; may, if desirous to alter the term of the certificate or provisional order, apply in advance for inspection before the expiry of the term of such certificate or provisional order.

		Section-24:	<p>Project Proponent has to comply with:</p> <p>The owner shall not:</p> <p>(a) Carry out with the person who has not boiler repairer certificate on the receipt of notice to repair, alter, add or renew any boiler, steam pipe, feed pipe or any mounting or other fitting attached to such boiler, steam-pipe and feed pipe.</p> <p>(b) Assign any person to charge the boiler used in the work except the person who operates and maintains the boiler</p>
		Section-29:	<p>Project Proponent has to comply with:</p> <p>(a) Any person desirous to obtain a boiler attendant certificate may apply to the respective inspector in accord with the stipulations;</p>
		Section-30:	<p>Project Proponent has to comply with:</p> <p>The boiler attendant shall:</p> <p>(a) have the right to operate the boiler which is issued certificate or provisional order with the approval of the owner;</p>
		Section-31:	<p>Project Proponent has to comply with:</p> <p>The boiler attendant shall not use the boiler at more than allowable pressure.</p>
		Section-38:	<p>Project Proponent has to comply with:</p> <p>The inspector, in accord with the prescribed manners, shall:</p> <p>(a) Inspect the boiler existing within the area where he is responsible,</p> <p>(b) Inspect any boiler existing anywhere according to the assignment of the Chief Inspector.</p>
		Section-40:	<p>Project Proponent has to comply with:</p> <p>During performing under section 38, an inspector may enter and inspect any place or building in which he has reason to believe that a boiler is in use.</p>

		Section-59:	Project Proponent has to comply with: No one shall amend, alter, deface, destroy the form and make invisible the register number engraved under section 21.
		Section-62:	Project Proponent has to comply with: No one shall adjust and alter the safety valve in order to exceed the allowable pressure on his volition or under the instruction of the owner.
44	Law Relating to Aquaculture, 1989	Section 29:	Project Proponent has to comply with: No person shall do the following: (b) Obstructing navigation and flowing of water or polluting of the water within the fisheries water or abetting such acts
45	Fresh Water Fisheries Law, 1991	Section-40:	Project Proponent has to comply with: No one shall cause harassment of fish and other aquatic organisms or pollution of water in a fresh water fisheries water.
46	The related Law enacted by Mandalay Region Hluttaw and Rules issued by Mandalay Region Government.		Project Proponent will comply with this law (not available at hand yet)

3.2.3 International Conventions, treaties and agreements

International Environmental Agreements

Theme	Convention/treaty/agreement	Status	Focal point
Climate	United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification (UNCCD), Paris, 1994	Accession (1997)	MONREC/ FD
Air and climate change	United Nations Framework Convention on Climate Change (UNFCCC), New York, 1992	Ratification	MONREC/ ECD, MOT/DMH
	Kyoto Protocol to the Convention of Climate Change, Kyoto, 1997	Accession (2003)	MONREC/ ECD
	Vienna Convention for the Protection of the Ozone Layer, Vienna, 1985	Ratification (1993)	MONREC/ ECD
	Montreal Protocol on Substances the Deplete the Ozone Layer, Montreal, 1989 + amendments	Ratification (1993, 2012 for recent amendments)	MONREC/ ECD
	ASEAN Agreement on Trans boundary Haze Pollution, Kuala Lumpur, 2002	Ratification (2003)	MONREC
	Paris Agreement to combat climate change and adapt to its effects, 2016	Ratification (2017)	MONREC?
Pollution control	Stockholm Convention on Persistent Organic Pollutants (POPs), Stockholm, 2001	Accession (2004)	MONREC/ ECD
	Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and Their Disposal, Basel, 1989	Accession (2015)	MONREC/ ECD
	International Convention for the Prevention of Pollution from Ships (MARPOL), London, 1973 plus amendments in 1978	Accession 4/8/1988	MOT
Biodiversity and Natural resources	Convention on Biological Diversity (CBD), Rio de Janeiro, 1992	Ratification (1994)	MONREC/ ECD
	Cartagena Protocol on Biosafety to the CBD, Cartagena, 2000	Ratification (2008)	MONREC/ MOAI
	Nagoya Protocol on Access and Benefit Sharing (ABS) to the CBD, Nagoya, 2010	Ratification (2014)	
	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Washington, D.C., 1973+ amendments (1979 Bonn, Germany)	Ratification (1997)	MONREC/ FD
	Agreement on Establishment of ASEAN Regional Centre for Biodiversity	Ratification (2009)	MONREC/ FD
	ASEAN Agreement on the Conservation of Nature and Nature Resources, Kuala Lumpur, 1985	Signatory (1997)	MOFA

	Ramseur Convention on Wetlands of International Importance especially as Waterfowl Habitat, 1971+ amendments in 1982 and 1987	Accession (2004)	MONREC/ FD
	MRC Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin-April 1995	Became Dialog Partner with MRC in 1996	Directorate of Water Resources and Improvement of River Systems (DWIR) Ministry of Transport (?)
	Agreement between International Union for Conservation of Nature (IUCN), and the government of the Republic of the Union of Myanmar to establish an IUCN Office in Myanmar. This laid the foundation for future collaboration on addressing challenges and maximizing opportunities related to biodiversity conservation and sustainable development in country.	31 March 2016 Host Country Agreement (HCA) signed	Forest Department MONREC
	Mangroves for the Future (MFF)-MFF was founded on the vision, "Healthy coastal ecosystems for a more prosperous and secure future for coastal communities". The vision was supported by mission statement, "To promote healthy coastal ecosystems through a partnership-based, people focused and policy relevant approach that builds and applies knowledge, empowers communities and other stakeholder, enhances governance, secures livelihoods and increases resilience to natural hazards and climate change". https://www.mangrovesforthefuture.org/what-we-do/focus-areas-and-objectives/	In 2014, Myanmar joined as the 11 th member country	National Coordinating Body (NCB), which is chaired by the Director General of the Forest Department.
Cultural heritage	The Convention for the Protection of the World Culture and Natural Heritage, Paris, 1972	Acceptance (1994)	MOC
	Declaration on ASEAN Heritage Parks	Signatory (2003)	MONREC/ FD
	Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of	Ratified	National Cultural
	Ownership of Cultural Property, 1970		Central Committee
	Convention for the Safeguarding of the Intangible Cultural Heritage, 2003	Ratified	National Cultural Central Committee

Note: All of the terms (Ratification, Accession, Approval and Acceptance) signify the consent of a state to be bound by a treaty and consequently their legal implications are the same. All countries that have ratified, acceded to, approved or accepted a treaty are therefore Parties to it and legally bound by it.

(The primary distinction is only between ratification and accession, as only states which have signed a treaty when it was open for signature, can proceed to ratify it. Afterwards, states which have not signed a treaty during the time when it is open for signature can only accede to it. The terms "acceptance" and "approval" are of more recent origin and apply under the same conditions as those that apply to ratification. The uses of these terms have to do with the diversity of legal systems.

The country has participated in a series of conventions or conferences on climate changes:

- UN Climate Change Conference, COP 21 (conferences of the parties), Paris, 2015
- UN Climate Change Conference, COP 22, Marrakesh, 2016
- International Conference on Climate Change, 2017
- UN Climate Change Conference, COP 24, Katowice, Poland, 2018
- Second International Conference on Climate Change Colombo, 2018
- UN Climate Change Conference, COP 25, Madrid, Spain, 2019
- UN Climate Change Conference, COP 26, Glasgow, (2021)
- UN Climate Change Conference, COP 27, EL Alam Sheik, (2022)
- UN Climate Change Conference, COP 28, Dubai, (2023)

Myanmar has either signed or ratified no less than thirty treaties, conventions and protocols concerning environment, it is learnt.

3.2.4 International Standards and Guidelines

Young Investment Group Industry Co., Ltd will refer to these international standards and guidelines as practical as possible. (for reference only)

- 1) Cement Production. www.ebrd.com/policies/const.
- 2) Cement quality. www.polskicement.pl/pges/upload
- 3) IFC. 2007. Environmental Health and Safety Guidelines for Cement and Lime Manufacturing. IFC, World Bank
- 4) IFC. 2007. Environmental Health and Safety Guidelines for Mining.

- 5) IFC. 2012. Sustainability Framework: Policy and Performance Standards on Environmental and Social Sustainability
- 6) IFC. 2007. Environmental, Health and Safety General Guidelines.
- 7) IFC. EHS guidelines for coal processing. <https://www.gov.at/content/files/E>
- 8) IFC. Cement manufacturing. <https://www.wbcscement.org/pdf>
- 9) ISO/TC.74. Cement and Lime. <https://www.iso.org/cat>
- 10) ISO.679.2009. Cement test method. <https://www.iso.org/standard>
- 11) ISO.91.160.10. Cement, Gypsum, Lime mortar. <https://www.iso.org/htm>
- 12) Management of tailings and waste materials in mining/quarry. Europa IPPC Bureau. [eppchjne:ec.europa.eu>ref](http://eppchjne.ec.europa.eu/ref)
- 13) ECD, MOECAAF 2015. National Environmental Quality (emission, effluent) Guidelines. Pec.2015
- 14) New Dry Process Cement Plant. www.greatwallco/cementplant/
- 15) Production of Cement. www.webcrawler.com/
- 16) Safety and sustainable mining with 150 standards. www.150.org/iso/news.archive.news.
- 17) Safety in cement industry. <https://www.wbcscement.org/pdf>
- 18) Safety guidelines in Chinese mines and quarries. www.xinhaimineral.com/benefication.

3.3 Contractual and other Commitments

Commitments made by the project proponent

- (a) First of all the project proponent Young Investment Group Industry Co., Ltd declares that the information in the report is, to the best of its knowledge, true, accurate and complete.
- (b) The EIA report has been prepared in strict compliance with applicable laws, rules, regulations, guidelines and procedures.
- (c) The project proponent will at all times comply fully with the commitments, mitigation measures, and plans in the EIA Report. (Re: EIA Procedure; Notification No.616/2015; Section 62, a-c)

Young Investment Group Industry Co., Ltd has made a sincere commitment to comply with law, rules and regulation and will do a business that is environmentally sound.

Young Investment Group Industry Co., Ltd commits to create a healthy and safe working place and working condition. First priority will be given to the Occupational Health and Safety of the workers and the Environmental, Health and Safety of all workers and the community. Young Investment Group Industry Co., Ltd will strictly follow the National Environmental Quality (air emission and effluent) Guidelines prescribed by ECD.

The company pledges not to pollute the air, water and land environment as practical as possible throughout the entire life of the project from the Construction Phase through the Operation Phase to the Decommissioning and Rehabilitation Phase. The Company will monitor and adopt suitable measures for environmental protection. And the company will follow all at the mitigation measures to be taken and the EMP implemented as prescribed in this EIA report.

The company commits 2% of its net profit for the implementation of CSR programme. The company has already spent Ks 70,100,000 for community development, community assistance, donations and charities (see ANNEX). The company will continue this CSR programme.

Daw Hla Myat Thu

Director

Young Investment Group Industry Co., Ltd

Commitments by the consultant firm, MESC

The consultant firm has made a sincere commitment and confirmed that:

- (a) The information and data in this EIA report are true and accurate and that the report is complete, and
- (b) That the EIA has been prepared in strict compliance with applicable laws including EIA procedure and with the ToR for the EIA (EIA procedure 616/2015, section-62 (a, b)).

The report has been prepared by MESC with utmost effort with all reasonable skills, care and diligence within the term of contract with the client Young Investment Group Industry Co., Ltd. Recommendations are based on our experience, using professional judgment and based on the information that is available to us.



Myint Kyaw Thura
Managing Director
Myanmar Environment Sustainable
Conservation

3.4 Myanmar Government Institutional Frame Work

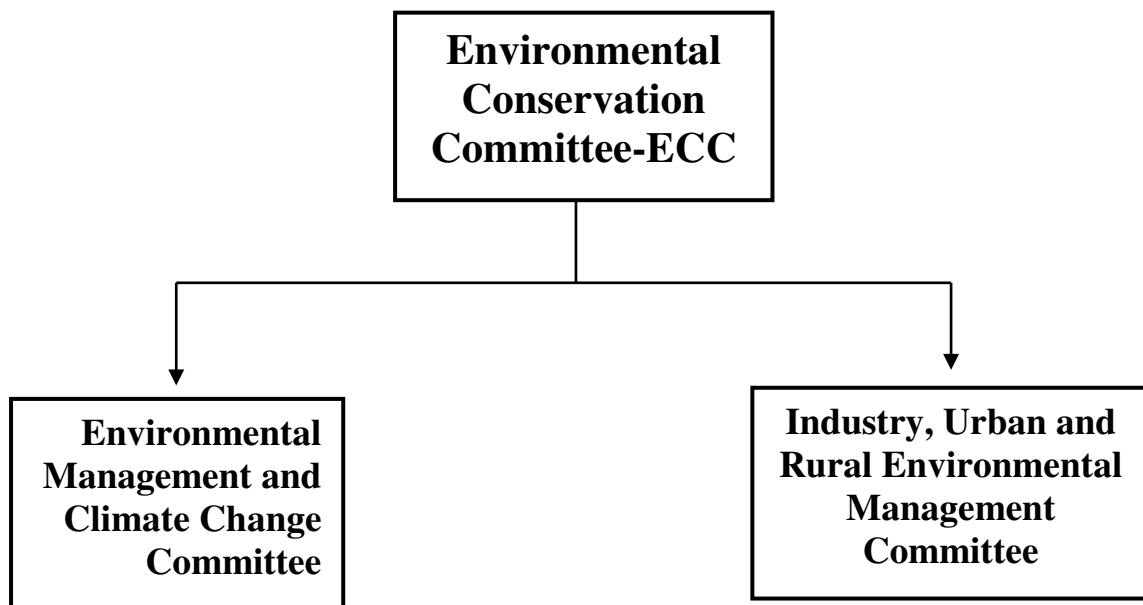
Article 45 of Myanmar Constitution (2008) clearly states that "The Union shall protect and conserve national environment".

Environmental conservation is an obligation of every citizen of Myanmar as per the Myanmar constitution (2008). Section-8, Article 390 of the constitution states that "Every citizen has the duty to assist the Union in carrying out the following matter: (b) environmental conservation.

The conservation of the environment was/is one of the priorities of successive governments.

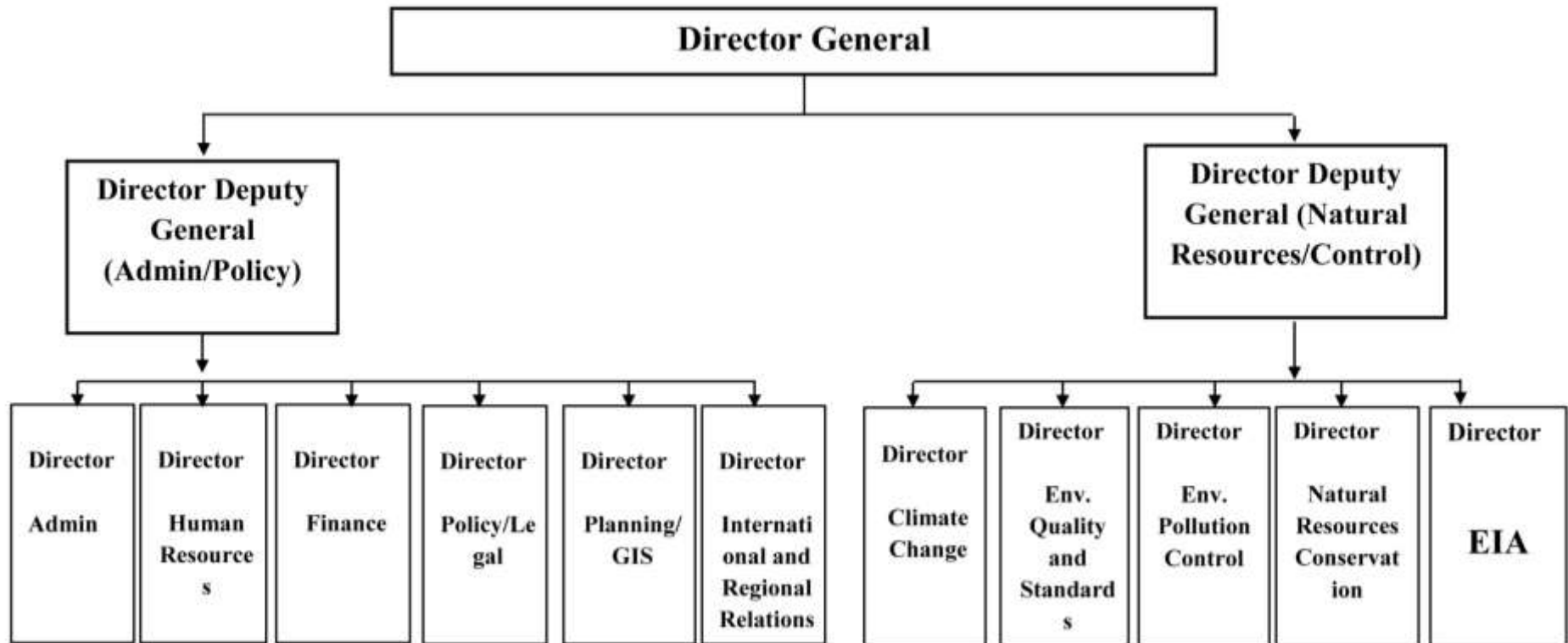
The National Environmental Conservation Committee (NECC) was formed in 2011 with the aim to achieve sound environmental management in the country. It is enlarged and reorganized as National Environmental Conservation and Climate Change Central Committee (NECCCCC).

Later the Environmental Conservation Committee- ECC was formed in 2021. The institutional organization of ECC is as follow:



Institutional organization of ECD

ECD is a major department under MONREC and is headed by a director general. Under the Director General are two Deputy Director Generals and 11 Directors at the directorate. ECD is the focal and coordinating agency for the overall environmental management of the country. It is also directly responsible for all the management of IEE, EIA, EMP etc. activities taking places all over the country.



These eleven departments are each headed by a director.

The main tasks of ECD include:

- implementing environmental conservation policy
- designing and implementing monitoring programmes
- prescribing environmental quality standards and,
- conducting activities relating to waste management and conducting environmental impacts assessments

Environmental Conservation Departments at States and Regional levels under the Directorate were established in all the 14 States and Regions of the nation. At each State/Region level there are one Director, one Deputy Director and four Assistance Director. This will surely greatly enhance the conservation of the environment and especially the management of the environment of the country.

The Occupational and Environmental Health Division (OEHD) – under the Ministry of Health and Sports is the focal department involved in environmental and health affairs.

OEHD is involved in implementing Environmental Health Programme in the country.

At the moment it is involved in:

- Environmental monitoring: on air quality and water quality
- Medical monitoring: health assessment on workers (periodic medical examination, performing physical examination, chest X-ray, biomarker survey on workers.
- Work place assessment: on air quality, solid waste and waste water, heat stress and light, noise level, soil quality, water sanitation and hygiene etc. in certain factories.

Assessment of environmental health probably related to climate change and general health impact.

3.4.1 Institutional Arrangement of the company

The institutional arrangement of the factory (for line 1 and 2) is as follows:

Sr. No.	Type of Personnel	Department	No.of Persons
I	<u>Production Department</u>		
1	Production Manager	Production Department	2
2	Deputy Production Manager	Production Department	2
3	Assistant Production Manager	Production Department	2
4	Production Technician	Production Department	7
5	Production Personnel (Production Worker)	Production Department	124
	<u>Process Production Line(Including Power Generation)</u>		
6	Process Production Line Manager	Production Department	2
7	Process Production Line Technician	Production Department	3
8	Process Production Line Personnel	Production Department	100
	<u>Central Control Room</u>		
9	Central Control Room Manager	Production Department	2
10	Central Control Room Technician	Production Department	2
11	Central Control Room Personnel	Production Department	24
	<u>Central Lab</u>		
12	Central Laboratory Manager	Production Department	2
13	Central Laboratory Technician	Production Department	2
14	Central Laboratory Personnel	Production Department	15
II	<u>Mechinery and Power</u>		
15	Mechinery and Power Manager	Mechinery and Power Department	2
16	Assistant Mechinery and Power Manager	Mechinery and Power Department	2
17	Mechinery and Power Technician	Mechinery and Power Department	4
18	Mechinery and Power Personnel	Mechinery and Power Department	17

	<u>Mechanical Repair</u>		
19	Manager	Mechinery and Power Department	1
20	Assistant Manager	Mechinery and Power Department	1
21	Mechanical repair Technician	Mechinery and Power Department	2
22	Mechanical Repair Personnel	Mechinery and Power Department	14
	<u>Electrical, Instrumental Repair</u>		
23	Electrical, Instrumental Repair Section Manager	Mechinery and Power Department	1
24	Electrical, Instrumental Repair Section Assistant Manager	Mechinery and Power Department	1
25	Electrical, Instrumental Repair Technician	Mechinery and Power Department	2
26	Electrical, Instrumental Repair Personnel	Mechinery and Power Department	12
III	<u>Technical Service Department</u>		
27	Technical Service Manager	Technical Service Department	1
28	Technical Service Assistant Manager	Technical Service Department	1
29	Technical Service Technician	Technical Service Department	4
IV	<u>Operating Department</u>		
30	Operating Manager	Operating Department	1
31	Assistant Operating Manager	Operating Department	1
32	Operating Staff	Operating Department	14
33	Material Supply Manager	Operating Department	1
34	Assistant Material Supply Manager	Operating Department	1
35	Material Supply Staff	Operating Department	5
36	Selling Staff	Operating Department	6
37	Logistics Staff	Operating Department	8

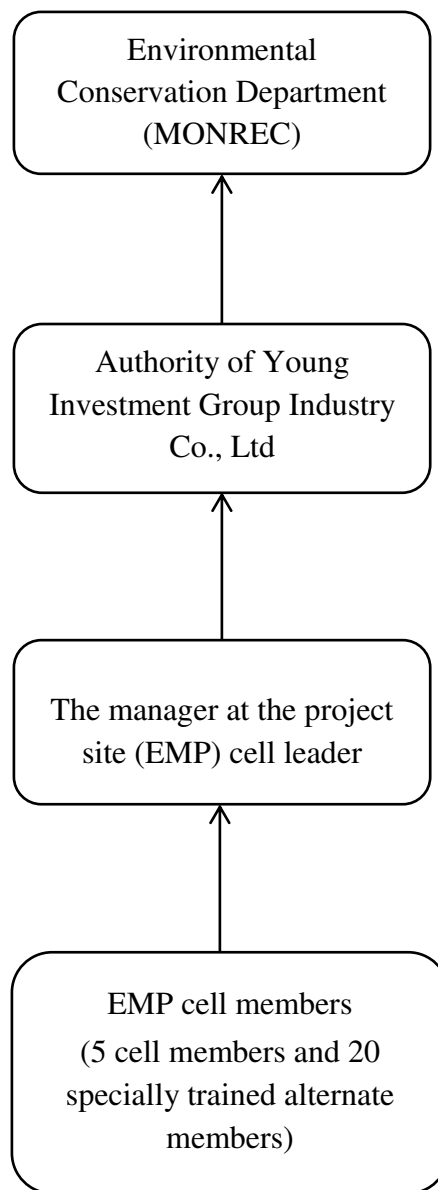
V	<u>Finance Department</u>		
38	Finance Manager	Finance Department	1
39	Chief Account	Finance Department	1
40	Accountant	Finance Department	3
	<u>Planning and Statistics</u>		
41	Planning and Statistics Manager	Finance Department	1
42	Planning and Statistics Staff	Finance Department	2
VI	<u>Human Resource</u>		
43	HR Manager	Human Resources Department	2
44	Deputy HR Manager	Human Resources Department	2
45	Assistant HR Manager	Human Resources Department	2
46	Human Resource Executive	Human Resources Department	6
47	Human Resource Staff	Human Resources Department	6
48	Environment Protection Manager	Human Resources Department	1
49	Environment Protection Technician	Human Resources Department	3
50	Environment Safety Technician	Human Resources Department	3
51	Fire Protection Technician	Human Resources Department	2
52	General Affairs Manager	Human Resources Department	1
53	General Affairs Technician	Human Resources Department	6
54	General Affairs Staff	Human Resources Department	2
55	<u>Admin Department</u>		
56	Admin Manager	Administration Department	1
57	Assistant Admin Manager	Administration Department	2
58	Administrative Staff	Administration Department	10
VII	<u>Plant Management Department</u>		
59	Manager	Plant Management Department	2
60	Deputy Manager	Plant Management Department	2
61	Assistant Manager	Plant Management Department	2
	Total		450

Approximately there will be 330 employees including 100 foreigners for line 1 and altogether 450 employees when line 2 will be in operation.

For implementation of EMP the company does not have an Environmental Health and Safety (EHS) department or Unit yet. For practical purpose a small nucleus organization, the EMP cell is organized. There are 7 members (including 2 villagers who are part-time). The manager doubles as EMP cell leader.

20 staffs are specially trained as EMP alternate cell members.

The institutional arrangement for implement of EMP, MP and mitigation



3.5 Project Environmental and social standards

3.5.1 National Environmental Quality Emission Guideline (NEQEG) by Environmental Conservation Department (ECD)

NEQEG guideline prescribed by ECD will be complied with; and the International Standards and Guidelines will be referred to as practical as possible. These are listed here:

The NEQEG guidelines for air quality, water quality, noise level and odour are excerpted and reproduced here:

3.5.1.1 Air Emission

Air quality

Young Investment Group Industry Co., Ltd will follow the general National Environmental Quality Emission Guideline values (Code no. 1.1) for air emission (NEQEG guidelines) as prescribed by the Environmental Conservation Department (from Notification No. 615/2015, December 2015, by ECD, then under the Ministry of Environmental Conservation and Forestry (MOECAAF), now MONREC.

Parameter	Averaging Period	Guideline Value $\mu\text{g}/\text{m}^3$
Nitrogen dioxide	1-year	40
	1-hour	200
Ozone	8-hour daily maximum	100
Particulate matter PM ₁₀ ^a	1-year	20
	24-hour	50
Particulate matter PM _{2.5} ^b	1-year	10
	24-hour	25
Sulfur dioxide	24-hour	20
	10-minute	500

^a Particulate matter 10 micrometers or less in diameter

^b Particulate matter 2.5 micrometers or less in diameter

Air Emission Levels - for cement manufacturing

Young Investment Group Industry Co., Ltd will follow the National Environmental Quality Emission Guideline values (Code no. 2.3.6.1) for air emission of cement factory (NEQEG guidelines) as prescribed by the Environmental Conservation Department (from Notification No. 615/2015, December 2015, by ECD, then under the Ministry of Environmental Conservation and Forestry (MOECAAF), now MONREC.

Parameter	Unit	Guideline Value
Cadmium + Thallium	mg/Nm ^{3a}	0.05
Dioxins / Furans	mg TEQ ^b /Nm ³	0.1
Dust (other point sources including clinker cooling, cement grinding)	mg/Nm ³	50
Hydrogen chloride	mg/Nm ³	10
Hydrogen fluoride	mg/Nm ³	1
Mercury	mg/Nm ³	0.05
Nitrogen oxides	mg/Nm ³	600
Particulate matter PM _{10c} (existing kilns)	mg/Nm ³	100
Particulate matter PM ₁₀ (new kiln system)	mg/Nm ³	30
Sulfur dioxide	mg/Nm ³	400
Total metals ^d	mg/Nm ³	0.5
Total organic carbon	mg/Nm ³	10

^a Milligrams per normal cubic meter at specified temperature and pressure

^b Toxicity equivalence factor

^c Particulate matter 10 micrometers or less in diameter

^d Total metals are Arsenic, Lead, Cobalt, Chromium, Copper, Manganese, Nickel, Vanadium, and Antimony

3.5.1.2 Effluent

Young Investment Group Industry Co., Ltd will follow the National Environmental Quality Emission Guideline values (Code no. 2.3.6.1) for air emission (NEQEG guidelines) as prescribed by the Environmental Conservation Department (from Notification No. 615/2015, December 2015, by ECD, then under the Ministry of Environmental Conservation and Forestry (MOECAAF), now MONREC.

Parameter	Unit	Guideline Value
pH	S.U.a	6-9
Temperature increase	°C	<3b
Total suspended solids	mg/l	50

^a Standard unit

^b At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity; when the zone is not defined, use 100 meters from the point of discharge

National Drinking Water Quality Standard (2019)

Parameters	Unit	Standard values*	WHO Guideline Values ⁹
Total Coliforms	Acceptable/No objectionable	3	None specified (recommended median value – 0 per 100 ml)
Fecal Coliforms	Acceptable/No objectionable	0	Must not be detectable in any 100 ml sample (recommended median value - 0 per 100 ml)
Taste	Acceptable/No objectionable taste		Non set (recommended median value - 3 DN)
Odor	Acceptable/No objectionable odor		Non set (recommended median value - 3 DN)
Color	True Color Unit (TCU)	15	Non set (recommended median value - 15)
Turbidity	Nephelometric Turbidity Unit (NTU)	5	Non set (recommended median value - 5)
Arsenic	mg/L	0.05	0.01 mg/l
Lead	mg/L	0.01	0.01 mg/l

Nitrate	mg/L	50	50 mg/l
Manganese	mg/L	0.4	0.4 mg/l
Chloride	mg/L	250	Non set (recommended median value - 250)
Hardness	mg/L as CaCO ₃	500	Non set (recommended median value - 500)
Iron	mg/L	1	Non set (recommended median value - 0.3)
pH	-	6.5 to 8.5	Non set (recommended median value - 6.5 to 8.5)
Sulphate	mg/L	250	Non set (recommended median value - 250)
Total Dissolved Solid (TDS)	mg/L	1,000	Non set (recommended median value - 1,000)

3.5.1.3 Noise level

Young Investment Group Industry Co., Ltd will follow the general National Environmental Quality Emission guideline values (Code no. 1.3) for noise, NEQEG Guideline as prescribed by the Environmental Conservation Department (from Notification No. 615/2015, December 2015, by ECD, then under the Ministry of Environmental Conservation and Forestry (MOECAAF), now MONREC.

Receptor	One Hour LAeq (dBA) ^a	
	Daytime 07:00 - 22:00 (10:00 - 22:00 for public holidays)	Nighttime 22:00 - 07:00 (22:00 - 10:00 for public holidays)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

^aEquivalent continuous sound level in decibels

Note: Noise level at work place must not exceed 85-90dBA. (Provide PPE, ear muff, ear protection for workers exposed to high noise level for long period. The ideal level not interfere with health is 45 dBA.)

3.5.1.4 Odour

Guideline standard for odorant unit is between 5 and 10. (Code No.1.4)

3.5.2 Social environmental general guideline IFC, Policy on Environmental and Social Sustainability, 2012

There are eight social and environmental performance standards for a big company to do business in a new area.

I) Assessment and Management of Environmental and Social Risks and Impacts

- identify and evaluate environmental and social risks and impacts of the project
- adopt mitigation measures to avoid, or if avoidance is not possible, minimize or mitigate the impact; compensate for the impacts on people and on the environment
- promote improved environmental and social performance through the effective use of management system
- ensure that grievances from the effected people are responded and managed appropriately
- promote and provide means for adequate engagement with the community throughout the project period

II) Labour and Working Conditions

- promote the fair treatment, non-discrimination and equal opportunity of workers
- establish, maintain and improve the worker-management relationship
- promote compliance with national employment and labour laws
- promote safe and healthy working conditions and the health of workers
- avoid the use of forced labour and child labour

III) Resource Efficiency and Pollution Prevention

- avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities
- promote more sustainable use of resources, including energy and water
- reduce project-related GHG emissions

IV) Community Health, Safety and Security

- avoid adverse impact on the health and safety of the community during the project life
- ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the community

V) Land Acquisition and Involuntary Resettlement

- avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs
- avoid forced eviction
- avoid, or where avoidance is not possible, minimize social and economic impacts from land acquisition or restriction on land use by
 - (i) providing compensation for loss of assets at replacement cost (value of asset plus transaction costs), and
 - (ii) ensure that resettlement activities are implemented with appropriate disclosure of information, consultation and the informed participation of those effected
- improve or restore, the livelihoods and standards of living of displaced persons

VI) Biodiversity Conservation and Sustainable Management of living Natural Resources

- protect and conserve biodiversity
- maintain the benefits from ecosystem services
- promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities

VII) Ethnic Peoples

- ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of ethnic peoples
- avoid adverse impacts of project on ethnic people, or when avoidance is not possible, minimize and/or compensate for such impacts
- promote sustainable development benefits and opportunities for ethnic people in a culturally appropriate manner
- establish and maintain an on-going relationship with these people throughout the project period
- respect and preserve the culture, knowledge and practices of ethnic peoples

VIII) Cultural Heritage

- protect cultural heritage from the adverse impacts of project activities and support its preservation
- promote the equitable sharing of benefits from the use of cultural heritage.

4 PROJECT DESCRIPTION AND ALTERNATIVE SELECTION

4.1 Project background

Young Investment Group Industry Co., Ltd was registered as a private company limited by shares in January, 2011 and renewed on 1-7-2013.

In order to meet the demand of Cement in the country and to enhance the Construction Sector of the nation Young Investment Group Industry Co., Ltd proposed for the construction and operation of a cement factory (capacity 5000 tons/day 2 lines) at Mya Leik Taung Area near Nat Yay Kan village, Kyaukse Township, Mandalay Region.

Mya Leik Taung mountain area with its abundant limestone resource is an ideal site for the production of cement.

The scoping report for the project was submitted to the authority in November, 2021 and was approved by the authority on 11-10-2022.

This is the follow-up EIA report for the project.

4.2 Project location, overview map and site layout map

The proposed cement factory is 2.5 miles northeast of Nat Yay Kan Village, Thayet Pin Village Tract, Sintgaing Township, and Mandalay Region.

The factory will be a two lines factory with two identical factories. The factory No.2 will be in the adjacent southeast of the factory No.1.

The proposed site is about 11 miles northeast of Sintgaing Town and about 30 miles southeast of Mandalay City. About 3 miles in the northwest is Kandwin Village.

The coordinates of the site are: N. Lat. 21°45'18.57" and E. Long 96°16'26.07"; elevation 239 m asl. The site is at the south eastern side of the foot Hill of Limestone Mountain.

About 2.5 miles away from the center of the project site in the east is the Myitnge River which flows in a generally southeast to northwest direction in this area. The northern border of project site compound is close to Myitnge River. The Ye-ywa Dam is on this river and is about 2 miles north of the site. There is a motor road that runs generally parallel to the west bank of Myitnge River.

The proposed cement factory site is on the lowland relatively flat undulating terrain and surrounded by low mountains or hills. The area is either old farms or fallow land with shrubs. The forests at the foot hill are Secondary Dry Forest which is partially degraded.

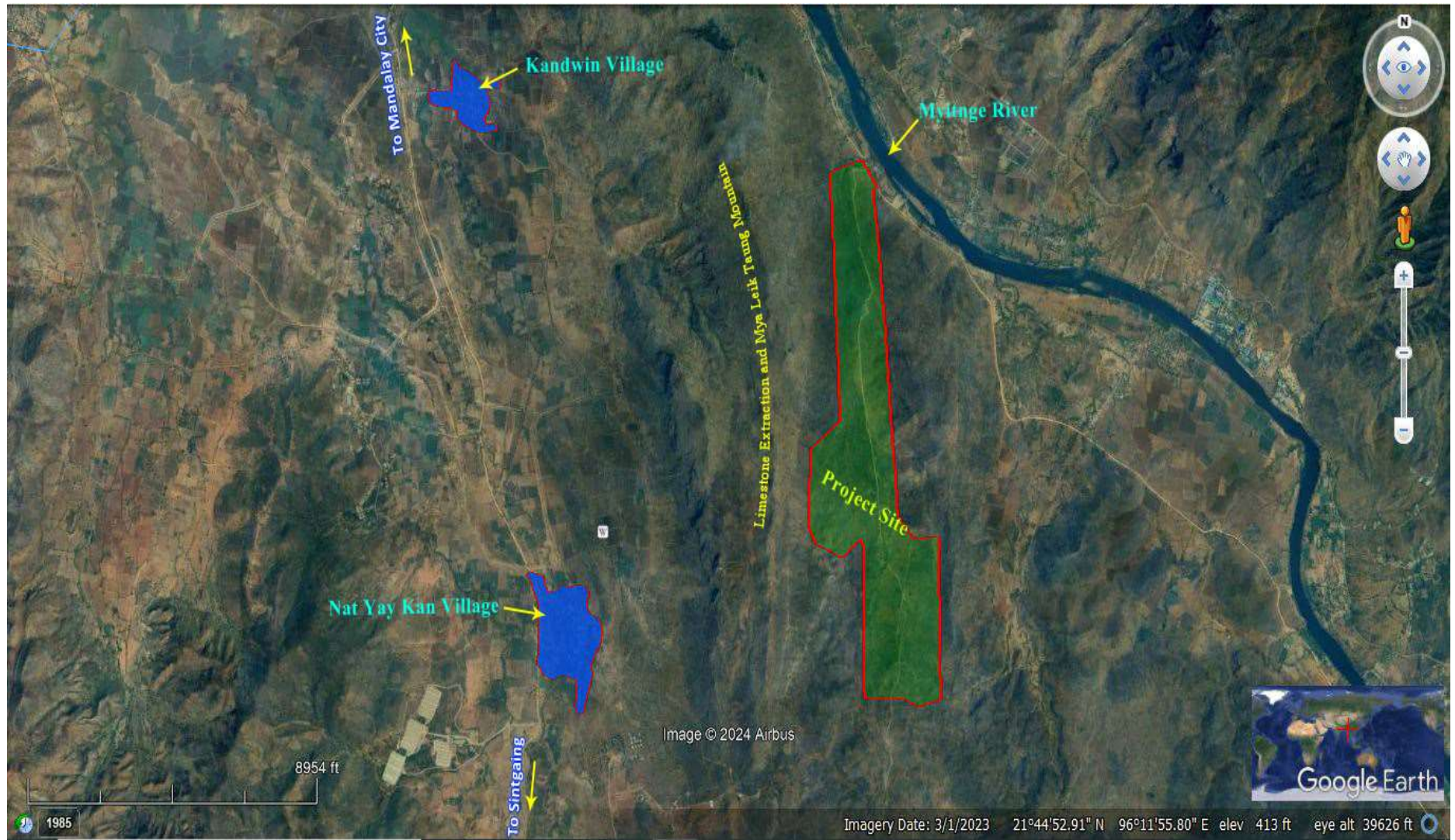
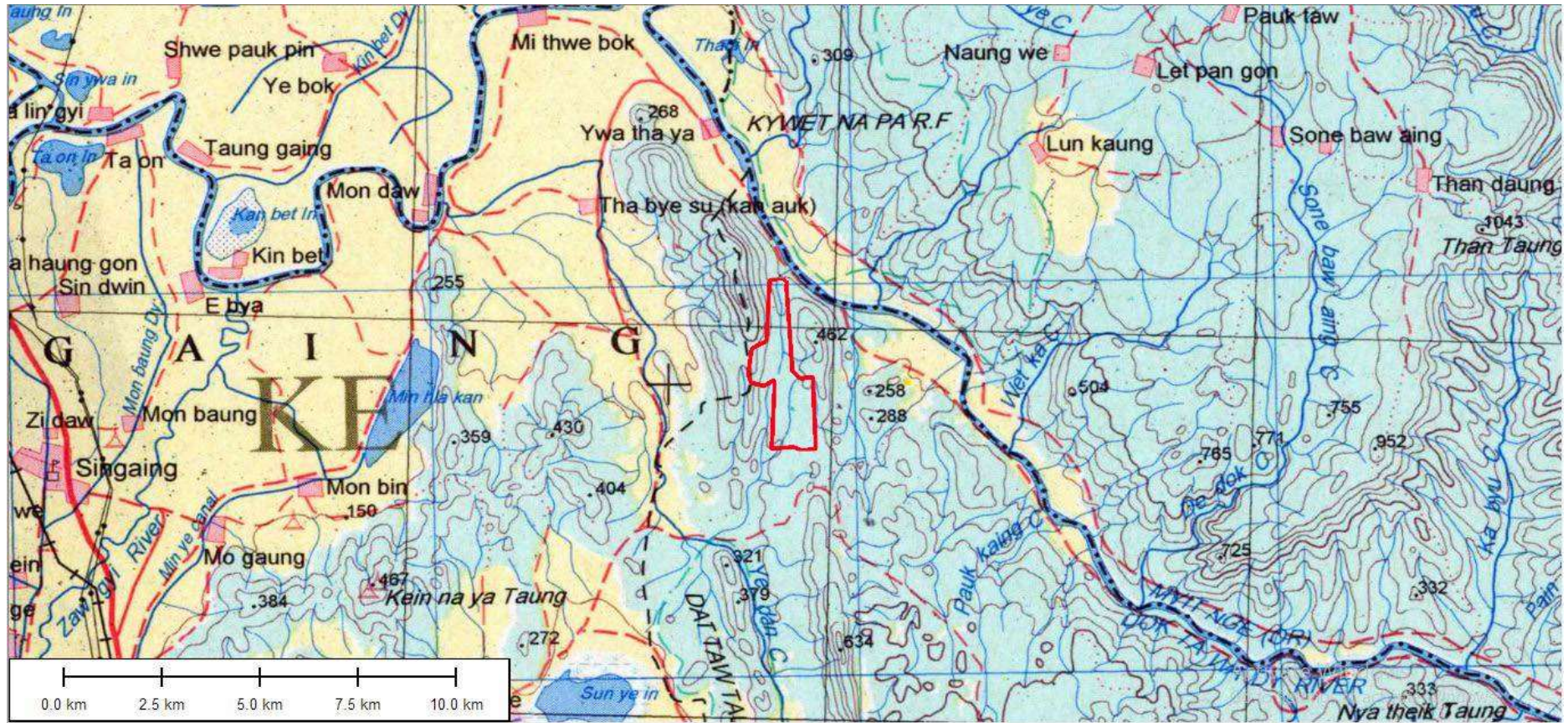


Figure – 7: Satellite image of proposed project area



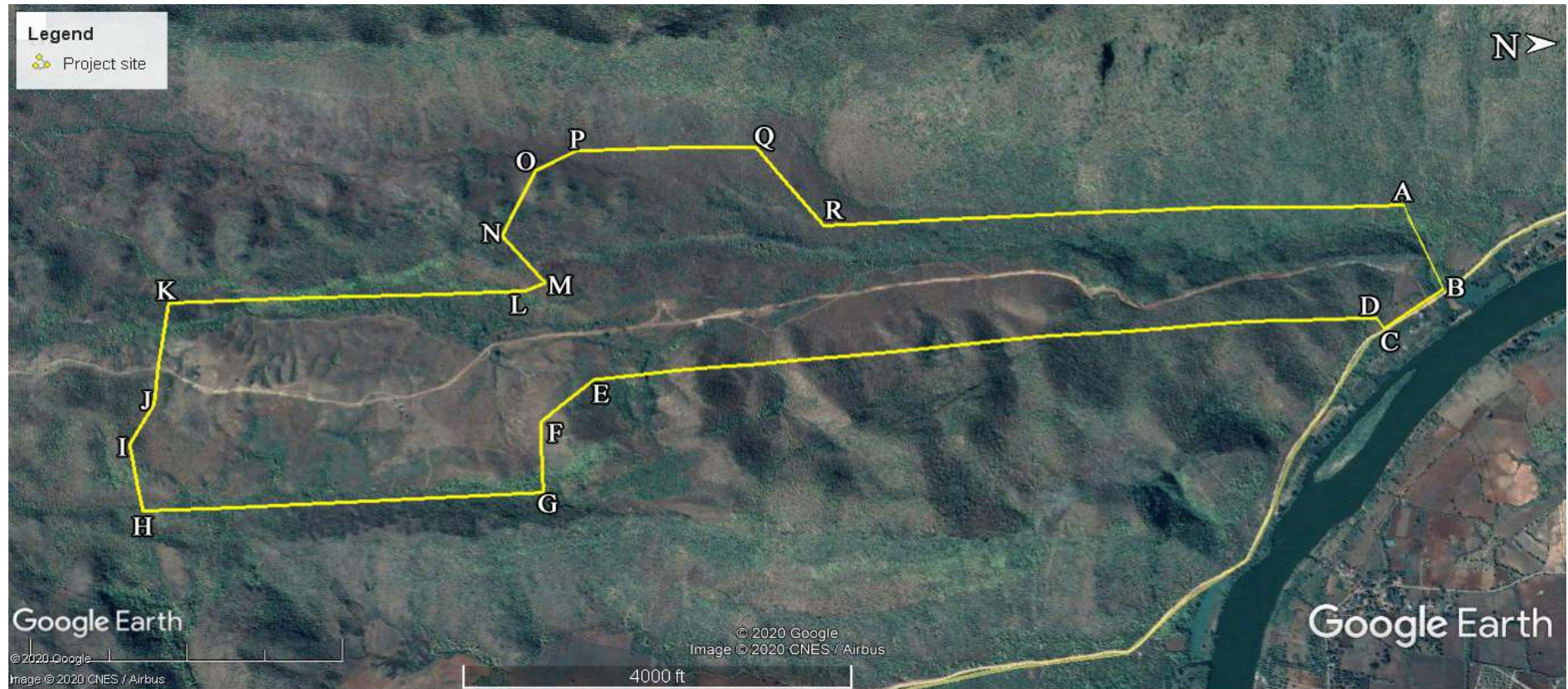
Legend

- motor road
- ~ river/stream
- township/village
- project site

Figure – 8: Map of part of Kyaukse Township showing project site



Figure – 9: Satellite image showing project site and its environs



LEGEND

A. 21°46'34.21"N, 96°16'14.41"E	F. 21°44'59.78"N, 96°16'42.49"E	K. 21°44'19.03"N, 96°16'27.08"E	P. 21°45'2.41"N, 96°16'8.18"E
B. 21°46'37.92"N, 96°16'25.10"E	G. 21°45'0.43"N, 96°16'50.77"E	L. 21°44'57.41"N, 96°16'26.26"E	Q. 21°45'22.07"N, 96°16'8.44"E
C. 21°46'30.68"N, 96°16'30.25"E	H. 21°44'18.96"N, 96°16'52.21"E	M. 21°44'59.57"N, 96°16'25.32"E	R. 21°45'29.30"N, 96°16'18.08"E
D. 21°46'29.93"N, 96°16'28.92"E	I. 21°44'17.34"N, 96°16'44.69"E	N. 21°44'54.74"N, 96°16'19.38"E	
E. 21°45'5.11"N, 96°16'37.38"E	J. 21°44'19.25"N, 96°16'39.83"E	O. 21°44'57.91"N, 96°16'10.70"E	

Figure – 10: Satellite image showing project site together with inflection points



Figure – 11: Satellite image showing project site and layout plan

4.3 Project development and implementation schedule

Young Investment Group Industry Co., Ltd has proposed for the building of a cement factory (5000 tons/day x 2 lines).

The project is, therefore, still in the Preconstruction Phase. The tentative schedule:

Preconstruction Phase : 1 year

Construction Phase : 2 years

Operation Phase : 25 years (extendable 10 years, twice)

Decommissioning/Rehabilitation Phase : 2 years

Note – At the moment the project has not commenced yet; it is still in the Preconstruction Phase.

The estimated budget

The estimated budget is USD 256.1072 million (for 2 lines factories).

Work force

There will be 330 employees for one line production including 100 foreigners. The yearly salaries ranged from USD 1,596 to 27,000.

Staff organization includes one general manager, 28 managers for several departments, 15 technicians, 253 production personals and 34 non-production personnel's, totaling 330 for one line and 450 for two lines.

Housing will be provided for all workers in the form of separate dormitories for male and female employees and quarters for families.

The working hours is 8 hours/day; 40 hours/week.

The working day (production days) is 310 days/per annum.

4.4 Description of the project

4.4.1 Area and size

The area of the project site is 513.16 acres; 400.6 acres for Factory Land 1 and 112.56 acres for Factory Land 2. The Coordinates for the site are N. Lat.21° 45' 18.57" and E. Long.96° 16' 26.07", elevation: 239 m asl. The site is at the south eastern side of the foot hill of limestone mountain, Mya Leik Taung

4.4.2 Installation and infrastructure

Main components of the proposed cement factory [5000 tons/day capacity x 2 lines (two identical factories)]

The main components of the proposed cement factory include:

- 1) Stores, warehouses, sheds for limestone, iron ore, sand, clay, gypsum, coal etc-
- 2) Limestone crushing and conveying; also for iron ore (crushers, conveyor)
- 3) Iron ore crusher
- 4) Limestone storage silo
- 5) Clay storage silo
- 6) Iron ore storage silo
- 7) Limestone prehomogenization storage
- 8) Corrective materials (iron ore, clay storage) crushing and storage hall, conveyor
- 9) Raw mill silo or raw proportioning silos (including silos for, limestone, clay storage, iron ore and sand, conveyor system)
- 10) Raw Grinding plant (including mill, tower, conditioning tower, dust collectors)
- 11) Raw meal silo
- 12) Preheater
- 13) Kiln; rotary (kiln inlet and accessories); height of stack :85m
- 14) Kiln head; calciner
- 15) Clinker cooling and storage (and conveyor)
- 16) Coal storage shed and crushing (coal crusher, conveyors, drying spot)
- 17) Coal processing (coal pre-blending, conveyor) and coal grinding mill
- 18) Gypsum and additive crushing and storage (crusher, conveyor, storage)
- 19) Clinker, gypsum and additive proportioning station
- 20) Gypsum silo
- 21) Additive silo
- 22) Clinker silo
- 23) Cement mill (cement grinding plant)
- 24) Cement silo
- 25) Cement packing plant
- 26) Cement bag-loading
- 27) Compressors house

- 28) Electrical main and substation (including backup generator)
- 29) Central control room and laboratory
- 30) Water storage tanks
- 31) Waste water treatment plant
- 32) Weighing stations(2)
- 33) Mechanical and electrical workshop and others

The other components are:

- The office building
- Dormitory or camp for workers
- Messing hall and kitchen
- Fuel oil depot
- Workshop
- Park for heavy machinery and vehicles
- Water pond
- Toilet, bath
- Magazine for explosive
- Stockpiling site for raw limestone
- Stockpiling site for crushed limestone
- Stockpiling site for overburden and topsoil



Figure-12: Proposed project site

The layout plan and design are shown below.

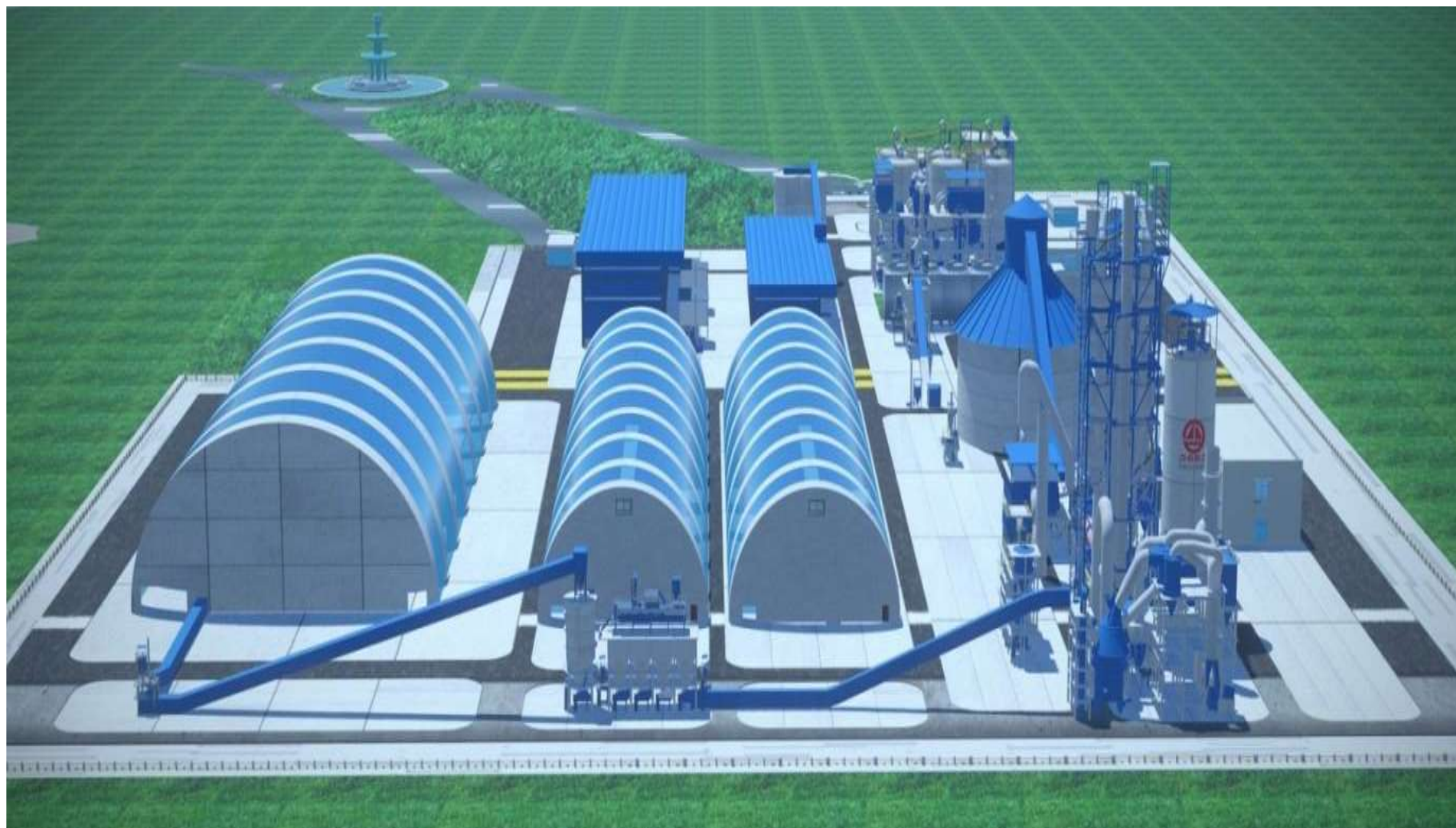


Figure – 13: Factory model (there will be two identical factories)

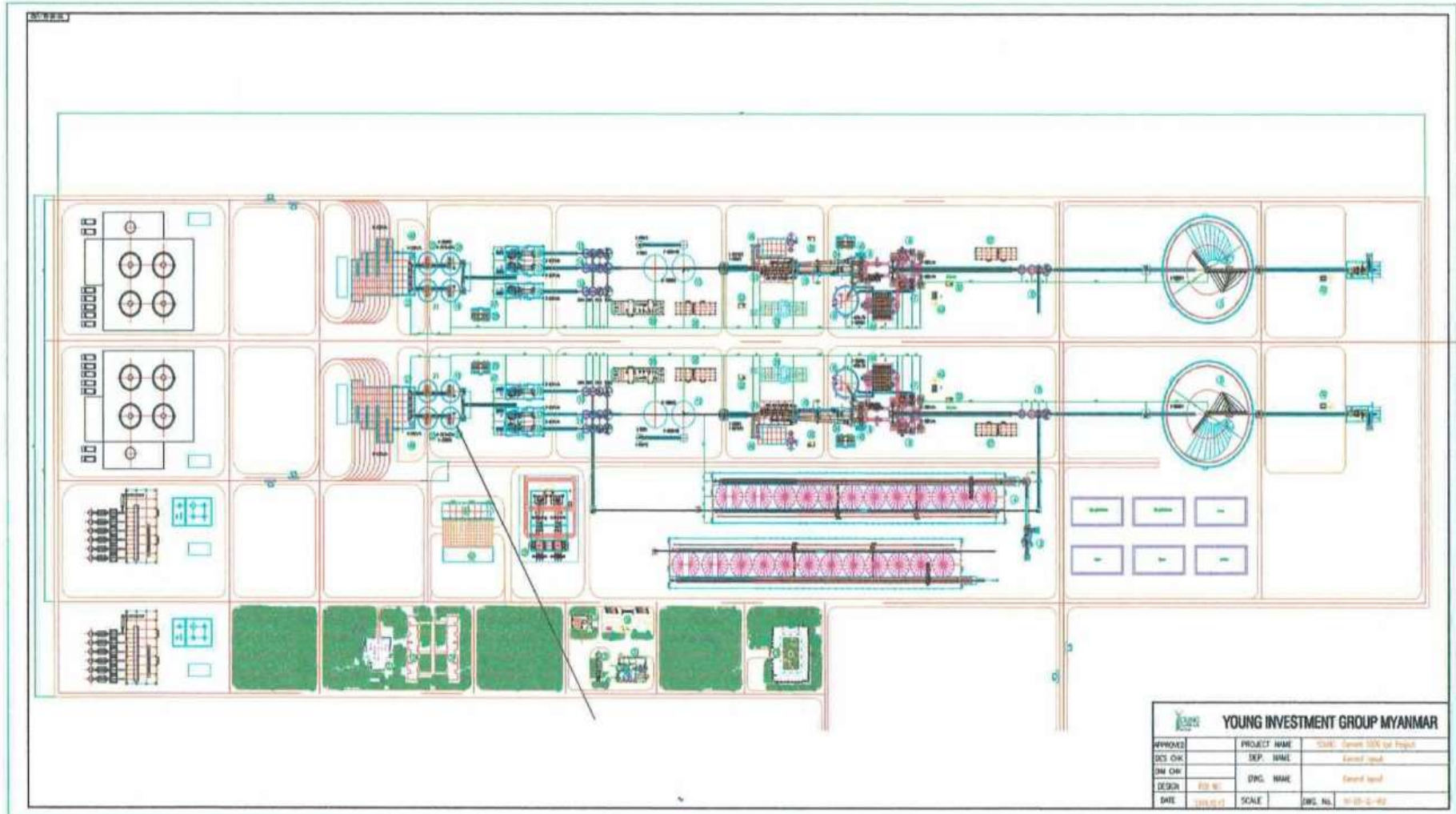


Figure – 14: Factory layout plan and design

Infrastructure

The propose project site has good access to Sintgaing Town in the northeast and Mandalay City in the south; there is an all season hard top motor-road.

The site has also access to water (Myitnge River, 2.5 miles in the east).

The site has access to gridline electricity from Shwe Sar Yan substation; but for reliable electricity the company has plan for building 2 x 20MW coal-fire power plants. The company will set up backup generators for use in case of power outage.

4.4.3 Machinery, equipment and vehicles (to be imported)

The following is the list of equipment for production lines for cement (5,000 tons/day one line).

Table – 1: List of Equipment

Item	Name of Workshop	Name of Main Equipment	Model, Specification, Performance	Quantity (place)
1.	Limestone crushing	Hammer breaker	800 t/h (max 900 t/h)	1
2.	Sand rock/Iron ore crushing	Impact crusher	280 ~350 t/h	1
3.	Raw coal	Ring hammer crusher	220~280 t/h	1
4.	Limestone pre-blending bed	Side cantilever stacker	800 t/h (nor) 900 t/h (max)	1
		Bridge-type scraping declaimer	500 t/h	1
5.	(Auxiliary material and raw coal pre-blending bed)	Side cantilever stacker (Auxiliary materials, raw coal shared)	400 t/h (max)	1
		Auxiliary materials side scraping reclaimed	300 t/h	1
		Raw materials side scraping reclaimmer	80 t/h	2
6.	(Raw material grinding and waste gas treatment)	Vertical mill	440 t/h	1
			864,000 m ³ /h 1,800 Pa	1
			864,000 m ³ /h 7,500 Pa	1
			900,000 m ³ /h	1
7.	Sintering system	Preheater and calciner	Five-class cyclone preheater plus in-line calciner	1
		Cylindrical roaster	ø4.8 x 74 m 5,000 t/d	1

		Fourth generation grate cooler	132.78 m ²	1
		Dust collector for kiln head	680,000 m ³ /h Air rate: 680,000 m ³ /h	1
		Exhaust fan of kiln head	700,000 m ³ /h Air rate: 700,000 m ³ /h 2,200 Pa Total head: 2,200 Pa	1
8.	Coal preparation	Air-swept mill	3.2 x (6.5 + 2.5)m Specification: ø 3.2 x (6.5+2.5) m 25 t/h Production capacity: 25 t/h	1
		Coal vertical mill	Ø 1,900 x 1,480 mm 25 t/h	1
9.	Cement finishing process	Roll crusher	650~850 t/h Throughput (Clinker): 650~850 t/h	2
		Cement grinding mill	Ø 4.2 x 13 m Specification: Ø 4.2 x 13 m 180 t/h Combined grinding capacity: 180 t/h	2
10.	Cement car bulk	Car bulk machine	120 t/h Capacity: 120 t/h	3
11.	Cement packing	Eight-mouth rotary packing machine	90~120 t/h Capacity: 90~120 t/h	4
		Mobile automobile cement bag-loading machine	Loading capacity: 2,400 bags/h	6
12.	Cogeneration	Steam turbine	N 9-0. 76/0.2 9,000 kw	1
		Electric generator	Qfw-10-2-10.5 10,000 kw	1
		Kiln boiler	AQC AQC furnace	1
		Back-end	SP SP furnace	1
13.	Self-provided generator	Generator, control panel	18 V/32/40	4 sets
		Pump	Heavy oil separation, air compressor	4 sets
		Distribution room		

Note: When 2 lines cement plant completed the production will be doubled to 10,000 tons/day, machinery, equipment and vehicles will be also doubled.

Vehicles and supporting equipment

Table – 2: List of vehicles and supporting equipment

No.	Description	Qty.
1.	Concrete Mixer Truck (10m3)	5
2.	Concrete Pump Truck	1
3.	Heavily Loaded Truck (30T,50T)	5
4.	Pick up	2
5.	Light Truck	2
6.	Picket Truck	1
7.	Off-road Vehicle	2
8.	Truck Crane (16T)	1
9.	Truck Crane (25T)	2
10.	Truck Crane (50T)	1
11.	Tower Crane	7
12.	Crawler Crane (150T)	1
13.	Gantry Crane	2
14.	Loader(Z50)	3

All these will be locally purchase.

Note: The Company has also plan for procurement of heavy machinery and vehicle for limestone mining/quarry such as crawler drills bulldozers, excavators, wheel loaders, dump trucks, breakers, rollers etc.

4.4.4 Technology, and production process

Technology

The company will apply the “Dry Process” technology which is more suitable for the production of Portland cement. The dry process technology requires much less water, less energy (electricity) and fuel (coal) and also lower cost of production.

(“Wet process” is still applied in some industrialize countries for the production other type of cements).

Production process

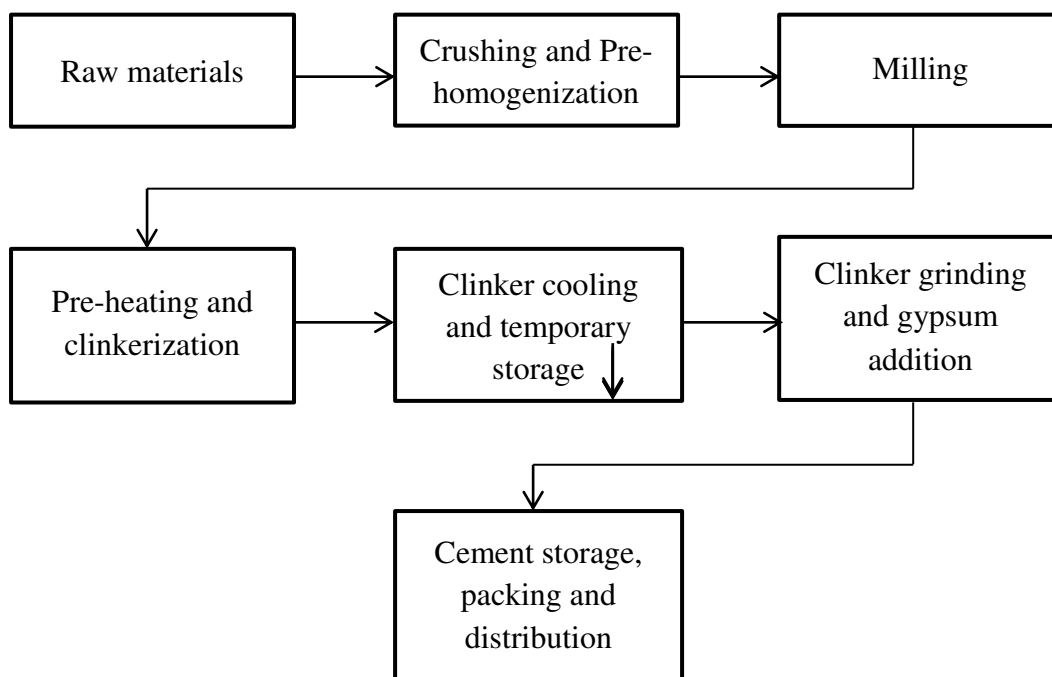
The raw materials are limestone, clay, laterite and gypsum. Coal as a form of coal powder, is used as coal burner.

The three main activities in cement production process are:

- Raw materials preparation
- Clinker production
- Cement grinding and distribution

Generally there are 7 major steps in the production of cement:

- 1) Procurement of raw materials eg.limestone etc.
- 2) Crushing and pre-homogenization of raw materials limestone, iron ore, sand and clay
- 3) milling (pulverization), homogenization and temporary storage of raw materials, limestone, iron ore, sand and clay
- 4) pre-heating and clinkerization (coal burner in the form of powder coal)
- 5) clinker cooling and temporary storage
- 6) clinker grinding and gypsum addition
- 7) cement storage, packing and distribution



The seven major steps can be a little elaborated as main activities as follows:

Main activities at the factory comprise:

- Limestone long distance conveying
- Limestone crushing
- Correctives crushing, raw coal unloading and conveying
- Limestone pre-blending and conveying
- Correctives pre-blending and conveying
- Raw coal pre-blending and conveying
- Coal grinding and dozing
- Raw materials proportioning
- Raw materials grinding and exhaust treatment
- Raw meal homogenizing silo and kiln feeding treatment
- Preheater and pre-calciner (pyro processing)
- Kiln and tertiary air duct
- Clinker firing and clinkerization
- Clinker cooling
- Clinker crushing and conveying
- Clinker storage and conveying
- Gypsum and additives pre-blending and conveying
- Gypsum crushing and conveying
- Cement proportioning
- Cement grinding and conveying
- Cement packing
- Cement storage
- Cement distribution (marketing)

For quality control there will be one central laboratory for testing/inspection of semi-finished products and finished product (Portland cement).

The process (cement manufacturing in brief)

The process is "dry process" (dry pre-decomposition production process).

The crushed raw material (limestone) is conveyed to raw grinding mill and pulverized to the form of talcum powder. The crushed raw material is dried simultaneously in the grinding mill furnished with cyclone separator. For drying process hot gas from rotary kiln meant for the purpose is introduced into the grinding circuit. Clay, iron ore, sand and clay are also prepared in the same way as limestone: crushed ground and dried.

The ground raw material (limestone) is then conveyed pneumatically into the homogenization silo. In the homogenization process corrective or additive materials such as clay, iron ore, sand are added and thoroughly mixed at proportion of 80% limestone, 15% clay and 5% , iron ore etc. (depending on the iron content of clay; it is an additive when FeO_3 content in clay is low). The corrected powder, that is, the properly homogenized powder, of limestone, iron ore and clay, known as raw meal (raw mix) is stored in storage silo to be fed to the kiln (rotary kiln) which is furnished with suspension pre-heater.

The burning process, (Pyro process) takes place in the rotary kiln. Coal is the main fuel used for firing preheater cyclone and rotary kiln. Coal is dried, ground to power, mixed with air and blown into the kiln where it ignites, providing the necessary intense heat (up to 1500°C) for the process.

After flowing through the heat exchanger and the kiln at an extremely high temperature of 1400°C the powder is physically and chemically transformed into clinker; this process is known as clinkerization. Coal burner, in the form of powder is used as fuel for heating.

Portland cement clinkers produced are dark grey nodules usually 3-5mm.

The next step is the cooling and temporary storage of clinker. The hot clinker is cooled by decreasing the temperature of air in the cooler and finally conveyed to clinker silo. The entire heating process (pyro process) is continually monitored and controlled from the central control room.

The next step is clinker grinding and the addition of gypsum. Gypsum plays an important role in controlling the setting properties that is, controlling the hardening of cement. The clinker together with the gypsum, at a ratio 95:5, is ground together in a grinding mill which is fed by gravimetric dosing devices. In this way the finished product, Portland cement, is formed. The standard quality of Portland cement is; specification; EN-197.1 (2000); strength class 42.5 MPa to 52.5 MPa (Mega Pascal).

The finished product, cement, is conveyed and stored in cement storage silo. (See **Figure** for flowchart diagram).

Cement is packed in two kinds of bags, namely, 50 kg bag and 1.5 kg ton bag for marketing.

Clinkerization process in brief and final stage of cement manufacturing

As mentioned earlier raw materials, limestone, iron ore, clay and fuel coal burner are thoroughly ground to a fineness of about 10% retained on 170 microns mesh and thoroughly homogenized.

After addition of a small quantity of water the homogenized materials are formed into nodules of 8-10mm in size. This is done with a nodulizer pan that rotates at a suitable speed and at a suitable inclination.

The nodules are fed into the kiln at a temperature of 1400-1500°C and transformed into clinker. (The chemical composition of clinker consists of CaO, SiO₂, Al₂O, FeO₃ chemical compounds.)

Finished products

The clinker is cooled and discharged. Later it is ground together with gypsum additive (5-7% gypsum) and formed into finish product (Portland cement: EN 197-1 (2000); strength class 42.5 MPa-52.5 MPa).

Production : 5,000 tons/day Portland cement (1 line)

10,000 tons/day (2 lines)

Production target

Daily output and annual output (t/d and t/a)

<u>Product</u>	<u>Quality Portland cement</u>
Clinker	- 5,000 t/d for 1 line (10,000 t/d for 2 lines)
Cement	- 1,800,000 t/a for 1 line (3,600,000 t/a for two lines)

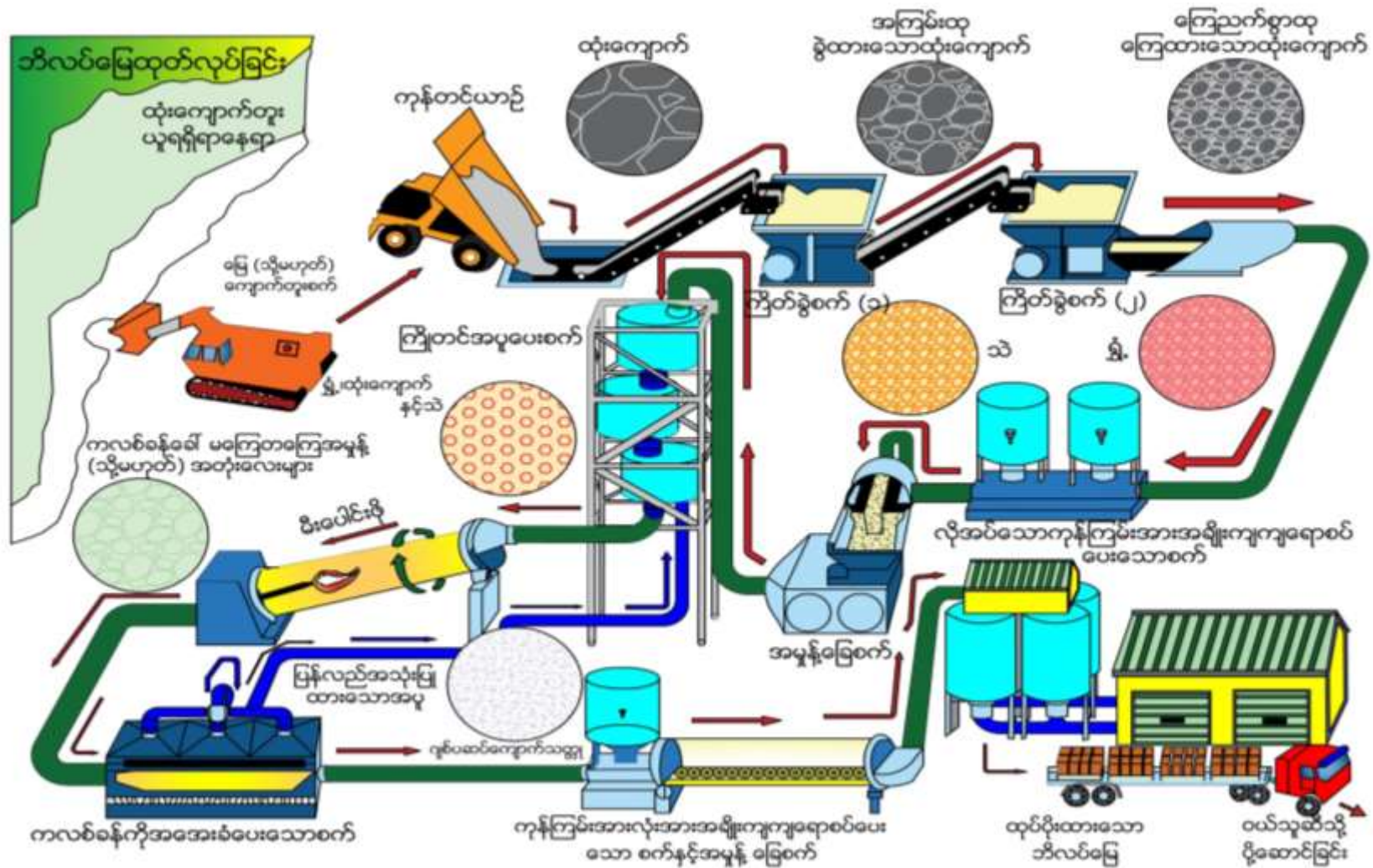


Figure – 15: Schematic diagram showing main processes in production of cement (Myanmar Engineers version)

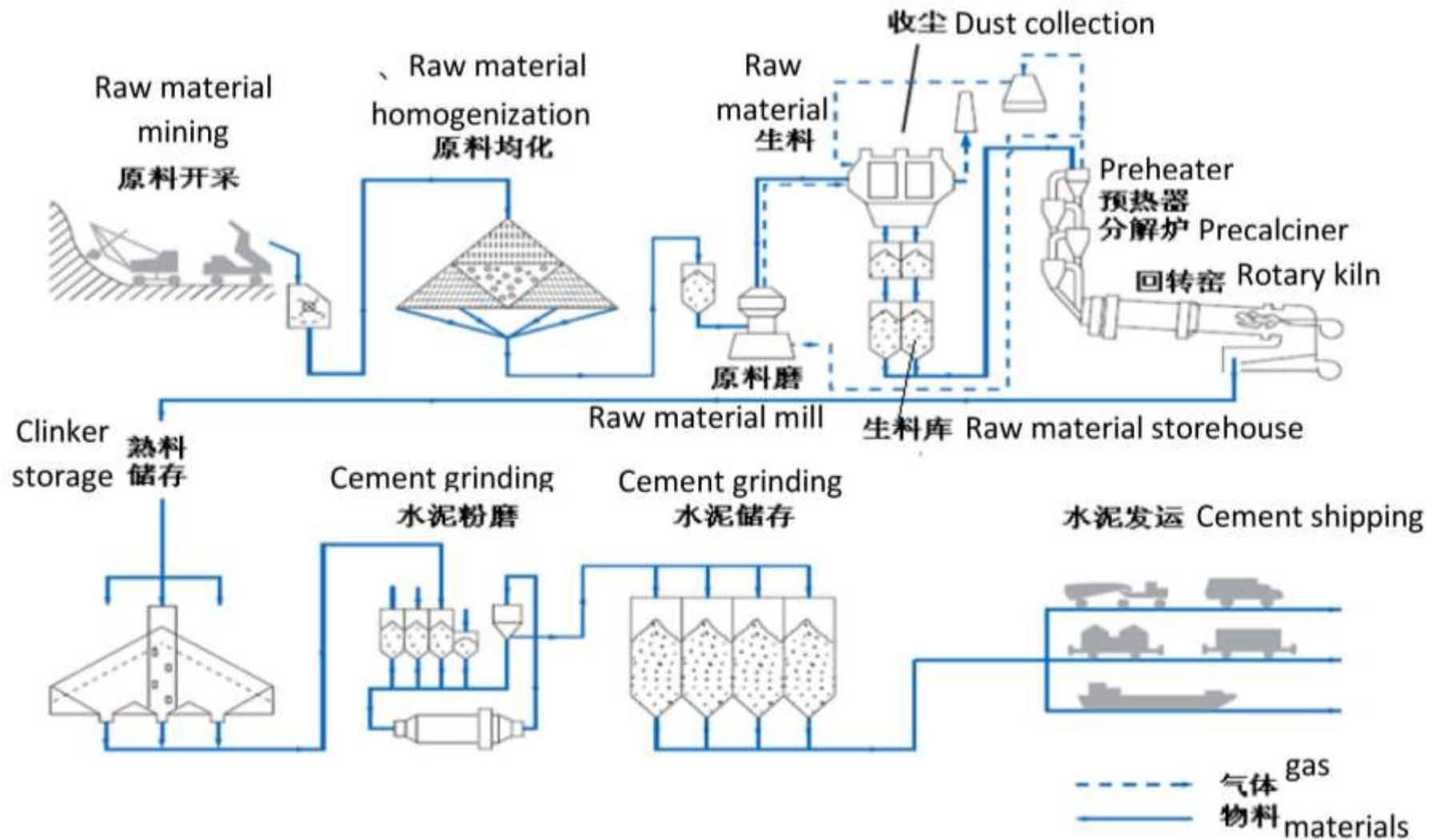


Figure – 16: Schematic diagram showing main process of cement production (Chinese engineer version)

4.4.5 Uses of raw materials and resources

The raw materials are limestone iron ore, clay, gypsum and coal.

Table – 3: Raw materials and resources

Sr.	Description	Requirement for one year (Ton)	Location	Area (acre)	Ore Reserved (million ton)	Tenure of Agreement
1	Limestone	2,306,800	Mya Leik Taung Area, Sintgaing Township, Mandalay Region	875	291.44	25 year with ME1
2	Clay	259,900	Phalumpin Kone Village, Sinkaing Township, Mandalay Region (30 km west from Cement Plant)	575		
3	Sand	117,000	Kywatnaphar Village, Sintgaing Township, Mandalay Region (River Sand from Myitnge River)			
4	Iron Ore	100,000	Inya Iron Ore Deposit, Pyin Oo Lwin Township, Mandalay Region (100 km north-east from Cement Plant)			
5	Gypsum	92,800	Thipaw Gypsum Mine, Manhe Village, Thipaw Township, Shan State			
6	Coal (Local)	109,000	Dathwekyauk Coal Mine, Maw Leik Township, Sagaing Region (YIGI's own mine)	5,600	20	25 years with ME1
7	Coal (Import)	109,000	Australia, Indonesia			

Requirement for two line factories

Limestone	-	2,306,800 t/a	(4,613,600 t/a for two lines)
Clay	-	259,900 t/a	(519,800 t/a for two lines)
Iron ore	-	100,000 t/a	(200,000 t/a for two lines)
Gypsum	-	92,800 t/a	(185,600 t/a for two lines)
Coal	-	218,000 t/a	(185,600 t/a for two lines)

The daily requirements for one line are roughly estimated as follow:

Limestone	-	7,650 tons
Clay	-	866 tons
Iron ore	-	333 tons
Gypsum	-	310 tons
Coal	-	727 tons

For the construction of the cement factory complex and associated buildings/structures the building raw materials requirements are:

- Concrete - 150,000 m³
- Steel bars - 12,500 tons
- Bricks - 200,000 m³
- Metals cladding - 102,000 m²

Sand, gravel of uncalculated quantity.

Properties of raw materials

- Limestone CaCO₃; CaO₃ > 50% ; lump size < 900mm
- Iron ore FeO₃ > 25% ; lump size ≤ 25mm
- Sand SiO₂ > 75% ; lump size < 5mm
- Clay Al₂SiO - AlO₃ > 40% ; lump size < 350mm
- Gypsum CaSO₄ 2H₂O > 70% ; lump size < 200mm
- Coal (subbituminous), C > 50% ; lump size ≤ 50mm

Properties of coal: carbon contentment 52.50%; sulfur content-0.93%; volatile matter 38.37%; moisture content 9.70%; specific gravity- 1.35; and calorific value 11720 But/lb (6510 cal/kg) *(From secondary information).

For storage of raw materials there will be each separate shed (open shed with roofing) for limestone, iron ore, sand, clay, gypsum and coal.

In addition there will be separate silo for processed or prepared materials, for instance, limestone storage silo, iron ore silo, clay silo, sand storage silo, gypsum silo etc. In addition there will be raw mill (raw proportioning silo), raw meal silo, additive silo, clinker silo, cement silo etc.

Fuel requirement

Diesel 60 tons/year for factory (20,000 gallons)

Diesel 20,000 tons/year for mine

Engine oil and lubricant 4 tons/year

Coal 250,000 tons standard coal per year for the power plant

Diesel and engine oil will be locally purchased (from Mandalay)

Properties of diesel: specific gravity 0.88; sulfur content 0.05% (wt); ash content 0.2%; calorific value – 44.8 mj/kg (from secondary information).

The company has a plan for the construction and operation of its own coal-fired power plant of 20MW. (There will be two power plants for two lines system.)

The factory will have a fuel depot 5 tanks with a capacity of 4,500 gallons each with a total capacity of 22,500 gallons.

Engine oil and lubricant, kept in drums, in fuel depot.

The fuel depot is at the corner of the factory premise.

Chemical requirement

The company will have one stored for chemicals near the laboratory. Some of the chemicals such as acids are corrosive and will be kept on separate shelves; some are reactive but none are flammable or combustible. Various separate shelves will be provided for chemical storage.

All chemicals will have labels (pictogram) for easy spotting.

All the chemicals are for laboratory use (quality control) and only very small quantities are required. The daily requirement will be just a few grams or millilitre (ml).

The list of chemicals for the factory laboratory is shown below.

Table – 4: Chemical list for laboratory

Sr	DESIGNATION	TYPE & SPECIFICATION	UNIT	Q'TY
K-Reagents and drugs				
1	Acetic acid	1.05 g/mL, mass fraction: 99.8%	500mL	10
	(CH ₃ COOH)			
	(NH ₃ .H ₂ O)			
2	Triethanolamine	1.12 g/mL, mass fraction: 99%	500mL	20
	(N(CH ₃ CH ₂ OH) ₃)			
3	Anhydrous alcohol	volume fraction: ≥ 99.5%	500mL	40
	(C ₂ H ₅ OH)			
4	Glycerol	volume fraction: ≥ 99%	500mL	20
	(C ₃ H ₅ (OH) ₃)			
5	Ethylene glycol	volume fraction: ≥ 99%	500mL	50
	(HOCH ₂ CH ₂ OH)			
	(NaOH)			
6	Sodium carbonate		500g	2
	(dehydrated)			
	(Na ₂ CO ₃)			
7	Ammonium chloride		500g	6
	(NH ₄ Cl)			
8	Potassium pyrosulfate		500g	1

	(K ₂ S ₂ O ₇)			
	(KOH)			
9	Barium chloride		500g	20
	(BaCl ₂)			
10	Silver nitrate		100g	2
	(AgNO ₃)			
11	Ammonium nitrate		500g	2
	(NH ₄ NO ₃)			
12	Ascorbic acid		25g	4
	(C ₆ H ₈ O ₆)			
13	Strontium chloride		500g	1
	(SrCl ₂)			
14	Diantipyrylmethane		25g	2
	(C ₃₃ H ₂₄ N ₄ O ₂)			
15	Ammonium carbonate		500g	2
	((NH ₄) ₂ CO ₃)			
16	Sodium acetate		500g	2
	anhydrous			
	(CH ₃ COONa)			
17	Seignette salt		500g	2
	(C ₄ H ₄ KNaO ₆ .4H ₂ O)			
18	Potassium chloride		500g	30
	(KCl)			
19	Potassium chloride	standard reagent	100g	2
	(KCl)			
20	Sodium chloride		100g	2
	(NaCl)			
21	Potassium fluoride		500g	5
	(KF)			
22	Hydroxylamine		25g	4

	hydrochloride			
	(HONH3Cl)			
23	Vanadium pentoxide		100g	2
	(V ₂ O ₅)			
24	Potassium iodide		500g	5
	(KI)			
25	Potassium bromide		500g	5
	(KBr)			
26	Methymol phenol	indicator	25g	5
	phthalein			
	(C ₆ H ₆ O)			
27	Strontium nitrate		500g	2
	(Sr(NO ₃) ₂)			
28	Titanium dioxide	standard reagent	10g	1
	(TiO ₂)			
29	Potassium dichromate	standard reagent	100g	5
	(K ₂ Cr ₂ O ₇)			
30	Ethylenediaminetetraacetic acid disodium salt	(EDTA-2Na)	250g	10
	(C ₁₀ H ₁₄ N ₂ Na ₂ O ₈ •2H ₂ O)			
31	Calcium carbonate	standard reagent	50g	4
	(CaCO ₃)			
32	Copper sulfate		500g	2
	(CuSO ₄ .5H ₂ O)			
33	Potassium permanganate		500g	2
	(KMnO ₄)			
34	Potassium biphthalate	standard reagent	100g	4
	(C ₈ H ₅ KO ₄)			
35	Hydrargyrum nitrate		250g	2
	(Hg(NO ₃) ₂)			
36	Benzoic Acid		250g	10

	(C ₆ H ₅ COOH)			
37	CMP indicator	calcein+Methylthymol Blue+phenolphthalein	25g	10
38	KB indicator	Chrome Blue+naphthol green+nitrate of potash	25g	10
39	Sodium sulfosalicylate			
	(C ₇ H ₅ NaO ₆ S·2H ₂ O)		500g	1
40	PAN indicator		5g	5
41	Methyl-red		25g	5
	(C ₁₅ H ₁₂ N ₃ O ₂)			
42	Bromophenol blue		25	5
	(C ₁₉ H ₁₀ Br ₄ O ₅ S)			
43	Phenylazoformic acid		25g	5
	2-phenylhydrazide			
	(C ₁₃ H ₁₂ N ₄ O)			
	(Hg)			
44	Paraffins		kg	2
	(C ₂₅ H ₅₂)			
45	Standard sample	For limestone	100g	2
		For clay	100g	2
		For Iron ore	100g	2
		For raw meal	100g	2
		For clinker	100g	2
		For cement	100g	2
		For coal	100g	2

Water and electricity

Water

Water will be sourced from the surface water of Myitnge River, 2.5 miles in the east. The company will establish a water treatment plant for the river raw water. The water treatment process involves reaction, precipitation, filtration and disinfection treatment. The treated water will be used for cement production and fire protection/fighting etc.

There will be systems for water supplies, namely, circulating water supply, production and fire water supply and domestic water supply.

- The daily water requirement for production line is estimated at 3630m³/day. (This covers the requirement for circulation water system, equipment spray, fire supplementary water, domestic consumption, greening and sprinkling of road, water consumption for waste heat power generation and mine water.)
- 97.5% of the water will be recycled, it is estimated.
- The domestic water consumption is estimated at 120m³/day.

The company has a plan for establishing a coal-fired power station of 20MW and if that materialized the additional water requirement for the coal-fired power station will be 5,000m³/day.



Figure – 17: The Myitnge River

Electricity

First the company has a plan for sourcing electricity from Shwe-sar-yan sub-station 7 miles away and plan for setting up backup generators for use in case of power outage.

When availability and reliability of access to electricity is considered the company has a plan for the establishment of self-provided coal-fired power station (20MW capacity) for each line. (2 x 20MW power station) 20MW can meet the production needs.

4.4.6 Wastes generated (emission, effluent, solid waste, disturbances etc.) and management in brief

For pragmatic purpose only wastes generated during the Operation Phase is considered.

During the Construction Phase huge quantity of vegetal wastes (resulting from the clearing of forest and vegetation) are generated for construction site and for access roads etc.

During and after construction works large quantity of solid waste (construction waste, tailings, debris etc.) are also generated. All these are cleared and the site is tidied up after construction.

The vegetal wastes (tree trunks, branches) are later used as fuel wood and given away to locals. The leaves are all cleared and burnt. Construction wastes that are reusable or saleable are reused or sold.

No solid wastes remain after Construction Phase.

During the Operation Phase

The main pollutant is dust (PM) followed by waste water

(1) Dust and other solid wastes

The main dust emission is point source emission/stationary emission from the stack with a height of 100m.

There are also fugitive dust emission such as from crushing, grinding, storage and transportation (vehicular movements) activities.

It is estimated that the total dust emission will be 72 kg/hr and dust emission per day is about 107 tons (source from emission factor for PM)

The highest emission (source or stationary emission) is from the 100m stack and the dust (PM) discharge volume of 17 kg/hr accounting for 24% of the total PM emission of the entire project. It is the focus of environmental governance. Kiln exhaust gas is the main dust source of the cement plant; the exhaust volume is large, the temperature is high and dust concentration is high.

Governance measures for emission

The designed is based from China's environmental protection design standards and the company will endeavour so that the emission meets the NEQEG Guideline values.

First of all the principle of "closed equipment and closed storage design" is followed as far as possible to reduce dust emission. Effluent dust removal equipment will be installed; the dust collected by dust collector (bag filter/bag dust collector) will be returned to the respective flow process and no solid waste will be discharged. A total of 58 bag filter (dust collectors) will be deployed for clinker production line.

The process can be summarized as follow: after the kiln exhaust gas passes through the SP boiler (suspension preheater boiler) the temperature is about 220°C. This part of the exhaust gas enters the vertical mill as a heat source for drying raw materials. In order not to effect cement production a bypass flue equipped with a humidifying pipe is provided. When the SP boiler and vertical mill are not working for some reasons, the flue gas enters the humidifying pipe and sprays water to cool down and then enters the through the bag house filter (bag filter). The final gas dust (PM) concentration emitted is not higher than 30mg/Nm³, and is discharged into the atmosphere through the stack, 100m high.

The large quantity of exhaust gas discharged from the clinker cooler has a high temperature but drop to 150°C after entering the AQC boiler (Air Quenching Cooler boiler). The bag house filter installed there collects the dust and the dust (PM) concentration emitted will not be higher than 30mg/Nm³.

The exhaust gas (PM) produced in the coal powder separation workshop is flammable and explosive. In the design special explosion-proof bag dust collector is selected and deployed; after passing through the bag dust collector the exhaust gas dust concentration emitted is not higher than 30mg/Nm³.

Dust from other sources

In a variety of processes such as, materials storage, transportation, raw materials batching, raw materials homogenization, clinker and cement grinding, bulk process etc dust is generated. Various bag-house filters will be installed at respective point, to purify dust containing gas generated at each point and will be discharge after concentration not higher than 20mg/Nm³.

Altogether 58 bag house filters will be deployed in the factory.

Dust collected at the bag house filters will be reused at respective flow processes.

In all the processes the main flue gas generated is CO₂. The burning of limestone desulphurize and reduces SO₂; while complete combustion due to high temperature minimizes NO_x.

Other solid wastes

As mentioned above exhaust dust is the main solid waste from the factory. Solid wastes in the form of ash, slag and cement dust are relative small in quantity as almost 100% of the raw materials (limestone, clay, iron ore etc.) are physically and chemically transformed into clinker in the pyroprocess that involves intense heat leaving little residual as ash. It is estimated that less than 300kg of down ash and slag will be generated per day.

Domestic solid wastes

Small quantity of domestic waste from dormitories, from office, kitchen and messing room (organic waste) will be generated. It is estimated that solid waste, trash and debris generated per day will be about 8 cubic feet. Waste bins (garbage bins) will be placed at appropriate spots and solid waste will be segregated into recycleable and non-recycleable. Recycleable wastes will be given away to any who want it; the non-recycleable waste will be disposed at an approved landfill by the Township Development Committee (TDC). The company will use its own truck for garbage/solid waste transportation. A landfill approved by TDC has not materialized yet; the company will liaise with TDC for this.

(2) Liquid wastes

These include the industrial liquid waste (production waste water) and domestic liquid waste.

Industrial liquid waste/production waste water

The main production water used at the cement factory is circulating cooling water and water spray for equipment; the waste water/used water is non-toxic and harmless.

To ensure the quality of the circulating water (97.5% recycled) the circulation system (including the waste heat power generation circulation system) needs to discharge 486m³ of waste water every day. Replenishment is made from circulation system supplement water. The discharged waste/used water can be used as water spray for humidification pipe lines.

Domestic waste water

Domestic water consumption is 120m³/day and it is estimated at half (60m³) will end up as domestic waste water/used water and sewage.

Toxic and/or hazardous wastes

Actually there are no substantial toxic or hazardous wastes in this cement factory context. However, used fuels are sometimes considered as hazardous wastes

Used oils are stored in old drums and given away to recyclers.

Accidental fuel oil spills or chemicals spill, if any, will be immediately removed by applying absorbents (no washing down with water to prevent percolation).

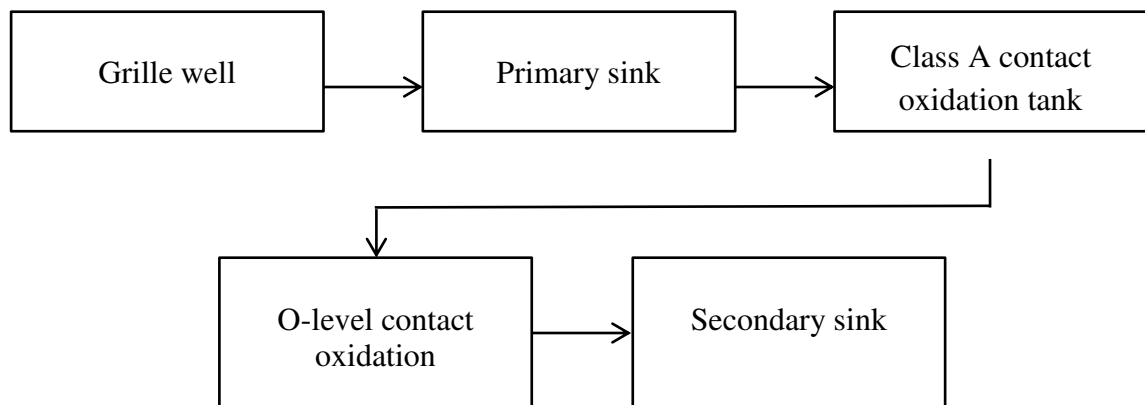
Used filter are also considered as hazardous wastes. They are collected in waste bins and disposed at the company landfill.

- The factory clinic which is more like an OPD generates negligible quantity of medical waste (used syringes, used bandage, cotton, pads, gauzes etc.); all are collected in waste bin and disposed at the landfill.

Sewage treatment

This includes a small amount of domestic waste water and a very small amount of domestic sewage. They are collected by the sewage pipe line and enters the sewage treatment workshop for centralized treatment. After the second-level buried biochemical treatment, it is discharged after reaching the second-level standard of sewage discharge.

The internal process flow of the buried secondary biochemical treatment device (buried waste water treatment equipment) is as follows:



In order to conserve water and make full of water resources, the circulating cooling water supply the equipment in this project is considered; and circulating water return rate reaches 97.5%.

Mitigation/control measures to be taken for emission, effluent, waste, disturbance etc will be prescribed in technical details in the Chapter-6.

4.5 Project alternative

It is necessary to have alternative plan in implementing a project but only the best or better alternative will have to be selected.

(a) Project site alternative or localtion alternative

This is out of the question. A cement factory is site specific, it must be near a limestone mountain because limestone is the major raw materials for manufacturing of cement. The limestone mountain of this area is an ideal landscape for large scale extraction of limestone, for the large scale manufacturing of Portland cement.

Moreover the site is easily accessible by motor road; the site has also easy access to gridline electricity.

Water from Myitnge River is readily available throughout the year; no need for sourcing ground water for cement production; only for drinking and domestic uses.

Above all the company has already invested huge sum of money for this project. At the moment there is no better location alternative for the company, the project proponent.

(b) Technology alternatives

The project proponent has selected the "dry process" (dry pre-decomposition production process) technology rather than "wet process" technology. The advantages of "dry process" technology are:

- The dry process needs little water; only water circulation system will need large quantity of water.
- The process is shorter and reduce time of process and reduce cost (cost of production is much lower than the wet process).
- The dry process is much more thermally efficient than the wet process and reduce power consumption by 20-30%
- The size of kiln needed is smaller.
- The need for fuel (coal) is lower (dry process needs 100kg of coal to produce 1 ton of cement while wet process need 350kg).
- Carbon dioxide emission is lower; 0.72 ton CO₂ /ton cement (in wet process it is 0.97 or more).
- Dry process technology is more modern and popular in the manufacturing of Portland cement. (However for manufacturing of special quality cement other than Portland cement wet process is still practiced in some cement factories in U.S.A.)

(c) Energy alternative

The site has easy access to gridline electricity from Shwe-sar-yan substation and the company will take advantage of this. Gridline electricity is pollution free and therefore, will be used throughout the long Operation Phase. However, electricity should be reliable electricity. The company has, therefore, plan for building two coal-fired power plants with a capacity of 20MW each to meet the long term need for electricity. There can be also energy failure or power outage from time to time from gridline electricity. But as an alternative one 500KVA generator will be installed as backup system. This backup generator will be just an alternative during the short power outage only.

As regard fuel oil the company has no chance to select any better alternative, for instance, diesel with low sulphur content; the company had to procure diesel that is available in the country.

(d) Supply alternative

For the consumption of water, fuel and energy the company will adhere to the principle of conservation rather than using them extravagantly; conservation is preferred to extravagance. Conservation and frugality are the basic principle of environmental protection and conservation and therefore the conservation or minimization of the uses of water, fuel and energy is a good and sound environmental conservation practice. For practical purpose the water will be 97.5% recirculated; the company has a plan for this (mentioned earlier).

In short, conservation alternative rather than extravagance alternative is selected.

(e) Activities alternative

The company will educate, train and supervise its staff for good working practice, good safety practice and good environmental practice rather than follow the traditional/conventional way in performing their jobs.

After gaining some experience the company will educate and train them to follow "work smarter" alternative rather than "work harder" alternative.

The company will also educate them to walk or ride bicycle rather than riding car when commuting to and from workplace to conserve fuel and to contribute to emission reduction. This is also a good and sound environmental protection practice.

(f) The "no go alternative" or "no project alternative"

This last option (alternative) is the "no go alternative" or "no project alternative". This last option (alternative) would mean no more development in the infrastructure of the country. The abundant natural resources (limestone) will remain unexploited and unused, while the infrastructure of the country e.g. roads, bridges, buildings and structures, will remain undeveloped. Or more cement will have to be imported from abroad and will have impact on the hard earned foreign exchange currency. The area will remain an unproductive arid land area. None of the benefit generated from the limestone resources will be realized by the nation which still remains an LDC (Least Developed Country). This will have a significant impact on the infrastructure of the country and subsequently curtail the long term socio-economic development of the country.

The "no go alternative" will therefore cannot contribute anything to the development of the construction sector and infrastructure sector of the nation. The 450 employees including 100 Chinese nationals to be employed during the Operation Phase will lose their employment opportunities if this project is not implemented. This is also true for the 200 or so construction workers to be employed during the Construction Phase. There will be no increase in employment for the nation.

As the project can also boost the local economy in many ways all these chance will be lost and all benefits will be forgone if the "no project alternative" happen.

If the "no project alternative" happens the direct investment of USD 256.1072 million by the project proponent will not materialize and this cannot contribute to the increase in the GDP of the nation. There will be also no chance for an increase in earning for nation in the form of taxes, duties, loyalty, revenue etc. if the "no project alternative" happens.

4.5.1 Comparison and selection of the preferred alternative

Sr. No.	Alternative	Prefer or not prefer	The reasons why
1	Project alternative/location alternative	not prefer	<ul style="list-style-type: none"> - The site is near the limestone mountain; ideal site. - The site has easy access by road, water, electricity. - The company has already investment huge sum of money (no alternative require).
2	Technology alternative	not prefer	<ul style="list-style-type: none"> - The dry process technology is the best for production of Portland cement; it is preferred to the "wet process".
3	Energy alternative	not prefer	<ul style="list-style-type: none"> - Can resource electricity from Shwe Sar Yan (no alternative require) sub-station (backup generator will be the temporary alternative during power outage).
4	Supply alternative	prefer	<ul style="list-style-type: none"> - Conservational uses of supply are preferred to conventional uses/ extravagant uses.
5	Activities alternative	prefer	<ul style="list-style-type: none"> - Work smarter is preferred to work harder. - Good working practice and good safety practice are preferred to traditional/conventional practices.
6	"no go" or "no project" alternative	not prefer	<ul style="list-style-type: none"> - The "no go" alternative cannot contribute to the increase production of cement. - Cannot create more job opportunities. - Cannot contribute to the earning of the nation (Tax, revenue, duty etc.) and raising the GDP.

Commitment

The Project proponent, Young Investment Group Industry Co. Ltd will do its but for production of cement factory plant in an environmentally sound manner as far as possible.

Daw Hla Myat Thu

Director

Young Investment Group Industry Co. Ltd

5 DESCRIPTION OF THE SURROUNDING ENVIRONMENT

5.1 Setting the study limit

Objectives

To set up a study limit area that is workable where detailed study can be conducted. The area outside the limit consider as buffer zone.

Since the factory will apply modern mitigation method for emission and effluent study limit area is reduced.

The study area encompasses the proposed project site and the area within the 2 miles radius about 12.6 sq. miles. Part of Myat Leik Taung Area in the northwest and a portion of the Myitnge River is in northeast fall into this 2 miles radius. The Nat Yay Kan Village in the southwest is also incorporated into the area of study.

The 2 miles radius is selected because it is pragmatic and workable for detailed studies. The 2 miles radius option is selected because the impact from a modern cement factory, applying environmental friendly technology, can be seen or felt within 2 miles radius. The outer portion of 3 miles radius can be regarded as buffer zone.

The company will deploy 58 bag house filters for mitigation of dust (PM) and it is estimated that 95% of pm will be reduced. SO₂ is not a problem; the burning of limestone effectively and completely desulphurize SO₂; long hours of steady complete combustion process eliminate NO_x.

(Unlike old out-dated cement factories that emit billows and billows of dark smoke into the atmosphere modern cement factory emit only light brown or while smoke. Theoretically if smoke enters the stratosphere layer of the atmosphere it can travel up to hundred miles away.)

Point source emission (stationary emission) from the stack is the main impact of cement factory. Theoretically dark smoke from a stack can be traced and seen several miles away if no mitigation measures are taken. The company has taken mitigation measures (complete combustion, desulphurization, bag filters) and therefore, the smoke generated is high brown or white (vapour like) colour and easily dissipate within 2 miles radius. The prevailing winds can carry the smoke to longer distance. However, as the area is several hundred miles away from the coast and sheltered by many mountain ranges prevailing winds are not dominant.

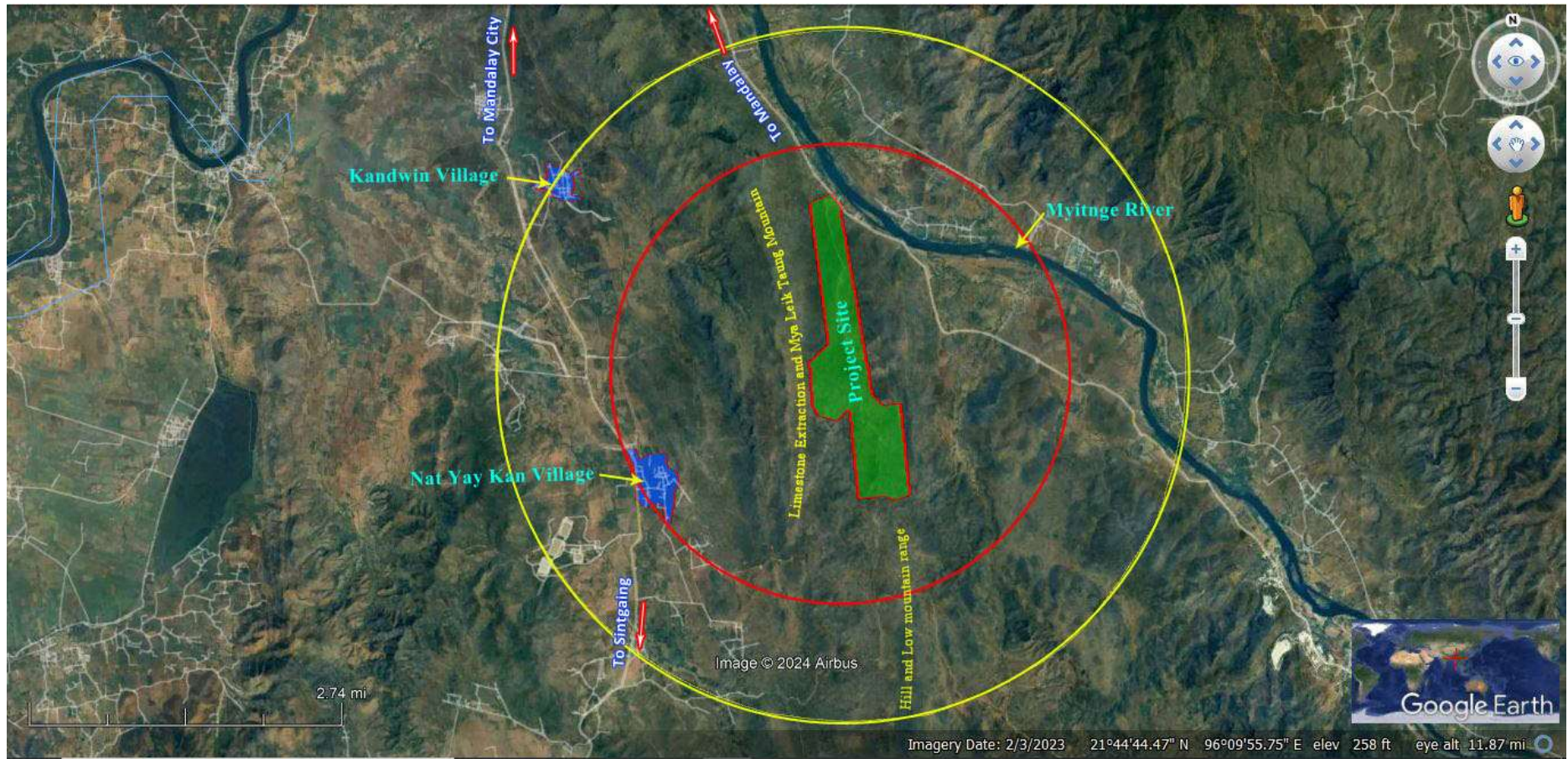
The impact of fugitive emission of dust can be seen and felt only within the inner 1 mile radius.

A cement factory is a relatively noisy factory but mitigation measures can minimize the noise level as far as possible. Being at the valley between two mountains noise level as well as emission can be naturally mitigated to some extent.

As regards impact of waste this will be managed; the company will dig its own landfills with the aids of excavators. The landfill will be occasionally covered by spreading sand and earth.

The AOI (biologically) will be only in the project site area of 513.16 acres (vegetation has to be cleared for construction of factory). The affected areas will be reforested.

The AOI (socio-economically) will be on the said village, Nat Yay Kan, in the south west. Kandwin village which is outside the 2 miles radius zone is also incorporated in the EIA study for any potential impact assessment. At least 3 official public consultation meetings have been held with the locals. A few casual meetings have been also held. The locals are aware of the potential impact which can be mitigated.



LEGEND

- Potential direct impact (2 miles)
- Indirect impact (3 miles)

Figure – 18: Satellite image showing project site and study limit

5.2 Methodology and objectives

EIA work involved the visual inspection of the area, the surveying work and collection of baseline environmental and social data.

The physical data such as air quality, particulate matter (PM), SO₂, NO₂ and noise were all primary data, collected through field survey. The data for water analysis were also primary data. Basic geological data is secondary data from a previous geological data.

Data on biodiversity; flora, fauna (birds, mammals, reptiles and amphibian and aquatic organisms, if present) were all primary data collected through this study. Some data for large mammals if any were secondary data from hunters.

The social data included both primary data collected through visual inspection and transect work, and secondary data acquired through Key Informant Interview (KII) or other secondary source (SS).

The methodology comprises desktop survey, field study, consultation meeting and the gathering of information and data and report writing.

Desktop survey covers the reviewing of all available report and literature.

As for pragmatic approach the testing and measurement of air quality, ambient air, PM, SO₂ and NO₂ involved the use of relatively sophisticated and bulky equipment and so technicians have to be contracted. The portable air test kits has the advantage of measuring the in situ (on the spot) condition but not so reliable.

For measuring air quality and PM the more advanced EPAS Air Sampler and EPAS Haz Scanner are used.

The duration of most measurements were 24 hours. (NO₂ and VOC were separately measured for one hour; O₃ and CO were measured for 8 hours).

Portable water test kits were also not so reliable and water samples have to be brought back to Yangon for analysis at a registered private laboratory. The technicians at this laboratory carried out the analysis work.

Noise level was measured on the spot using a portable Digital Noise Level Detector, VICTOR, which was quite reliable. The more sophisticated EXTECH Sound Level Meter is also used.

Vibration is measured by BENE TECH Vibration Meter.

All geological data are secondary information from the findings of geologists in previous study. The methodology involved Satellite image analysis, geological outcrop mapping, litho-geo-chemical survey, gravity investigation and mechanical drilling for extraction of samples at various depths, it was learnt. Analysis work was conducted in Yangon.

The monthly rainfall was obtained from Kyaukse District Meteorology Office.

The data on the biological components particularly flora were all primary data. All data on flora, birds, reptiles, amphibians were collected through this field surveys. The information on fish of Myitnge River was secondary information.

As wildlife are very scarce or almost depleted the flora remain the main biological component for study. The flora study involved the overall view of the forest and classification of forest type; distribution pattern, if possible, transect walk through or across or around the forest and on the spot identification of species. In addition specific ecological niches for bryophytes and certain epiphytes were also taken into account.

The essential tool for EIA survey work include computer, GPS, camera, telescopes (especially for birds) binoculars, hand lens, microscope (especially for aquatic microorganisms), compass, portable water and air test kits, anemometer, herbarium press, measuring tapes, ropes, pruners and cutter, tool for catching and trapping wild life (snare, trap, scoop, nets including plankton net, stakes etc.), lamp and torch for night survey for nocturnal animals. Chemical preservatives (alcohol, formalin) together with plastic containers of various sizes for the preservation of specimens (especially those that could not be identified during the survey trip but to be identified later) were also necessary.

Google Earth satellite imagery was also applied for the overview of forest structure, generalized distribution pattern, forest gradients, opened forest, canopied forest and for the possible detection of peculiar micro-ecological niches (for both plants and animals).

As regards socio-economic data most were secondary data. These were gathered by means of conducting Key Informant Interview (KII), on knowledgeable locals and also from certain Secondary Source (SS). Certain primary data were acquired by means of visual inspection; transect walks and focal group discussion (FGD).

Predesigned/Restructured, Questionnaires were applied for obtaining practice data/information for Ad hoc report.

As for cultural components there were no important cultural, religious, historical and archaeological monuments or sites in the area. The exceptional case: a Buddhist monastery in both villages and there was no likelihood to be impacted by the project.

In the case of visual component the landscape of the mountain would be impacted and this would be discussed in impact assessment in Chapter-6.

Objective

The main objective is the collection, recording and documentation of all baseline data for the preparation of EIA report. Secondary data on socio-economic aspects as well as secondary data on meteorological conditions are also collected.

5.3 Public administration and planning

At the moment there is no known industrial development plan for the area from the Union level, Regional level and Township level. There is also no known rural development, urban development and agricultural development plan for the area at the Union level, Regional level and Township level.

So far, there is no known plan for socio-economic development for Nat Yay Kan and Kandwin Villages. There is yet, no such plan for future agricultural development or industrial development for this area. There is yet, no such plan at the Union Government level, at Regional level or District or Township level.

There may be certain rural development plan, (general socio-economic aspects) implemented by NGO or INGO in the area but the EIA team does not have yet any information about this.

5.4 Legally protected area

The project site, being within the Dry Zone Region of Myanmar, has typical dry zone forest or shrub land or scrub land. The forests (dry forest) are partially or greatly degraded. The mountains especially the top of the mountains and hill are denuded and without trees, only shrubs. Trees typical of dry zone forest can be still found at the foot hill of Mya Leik Taung, but are generally degraded.

As regards legally protected area, there is the Kywet-na-pa Reserved Forest on the eastern side of Myitnge River, about 4 miles away in the east. It is a dry forest, typical of dry zone forest.

Dat Taw Taung future Reserved Forest is about 5 miles in the south; it is basically a dry forest but there are some large shade trees which are cultivated plants.

With the exception of Kywet-na-pa and the future Dat Taw Taung Reserved Forests there are no parks, wildlife sanctuaries, scientific reserves, nature reserve, geophysical significant reserve, protected cultural heritage area, protected archaeological areas or area of historical significance.

5.5 Physical component of the surrounding environment

5.5.1 Topography

The whole area consists of both flat terrain and undulating terrain, with low mountain or hills ranges which generally run from a north to south direction. The proposed site is a flat terrain surrounded by low mountains and hills. Nat Yay Kan village is in the southwest, Kandwin village and the Mya Leik Taung mountain range are in the northwest. The elevation at the site is 239 m asl.

There are isolated hillocks here and there in the area. In the northeast is the Myitnge River and its valley.

The river is about 2½ miles east of the site. There are no small rivulets, streams or streamlets in the vicinity but only few ephemeral streamlets or springs which dry up after the monsoon season. Five miles in the south-west is the Swan-ye-inn, a relatively large water body.

This lake has become something like a tourist attraction site for the locals and nationals.



Figure-19: Panoramic view of the proposed project site

5.5.2 Water resources

The only water source is the relatively large Myitnge River which flows generally in the south east to north west direction in this area. The river is about 2 ½ mile in the east but the northern tip of the project site is close to the river due to the flow direction from south east to north west.

There are no small rivulets or streams in the vicinity but only a few ephemeral streamlets or springs which dry up during the dry months.

Another large water body is the Swan-ye-inn, 5 miles in the south west.

5.5.3 Geology, soil and hydrology (from secondary information from the company's geologist)

The whole area is within the eastern periphery of the Ayeyarwaddy River Basin and the basic rock is sedimentary type. The mountain range and isolated hill are actually deposit of limestone, which is a younger type than dolomite limestone.

The area is within the Ayeyarwaddy basin sedimentary group and composed of 4-5 layers. The upper layer is alluvial soil of Recent Age. The lower layer is of Thitsipin Formation and lithological speaking composed of calcite limestone of the geological period of Lower Permian. Beneath the calcite limestone layer is the dolomite limestone layer of the geological period of lower Permian. Beneath the dolomite layer is the calcite limestone of the geological period of lower Permian. This layer had unconformity overlain the calcareous sandstone and siltstone layer of Ngwetaung formation during the geological period of Middle Ordovician.

The calcite limestone has light gray colour, micritic to fine grained in size. The calcite limestone consists of a few chert nodules.

Ngwetaung sandstone composes of gray colour fine grained calcareous sandstone and siltstone.

According to Chinese technicians the limestone layers at the top of the mountain range are of good quality but those at the lower layer are of inferior quality. The typical soil type is acrisols, according to FAO.

The rough estimation of the limestone reserves is about 291.44 million tons, it is learnt.

As regards hydrology the Myitnge River is the only hydrological symbol of the area. As regards hydrology there is no available information (the company has no plan for boring tube well and sourcing ground water; water will be sourced from the surface water of Myitnge River; water is not an issue).

5.5.4 Environmental quality

(a) Water quality

The water samples from Myitnge River, Nat Yay Kan village and Kandwin village wells collected and brought back to Yangon for analysis.

Date, 18-1-2024 (collected within one day)

At Myitnge River, coordinates : N. Lat. 21° 46' 38.3"; E. Long. 96° 16' 30.3".

At Nat Yay Kan vilalge, coordinates : N. Lat. 21° 44' 35.9"; E. Long. 96° 14' 52.0".

At Kandwin village, coordinates : N. Lat. 21° 46' 53.1"; E. Long. 96° 14' 15.0".

The results are as follow:

Table – 5: Surface water quality at three sites

Sr. No	Parameters	At Myitnge River	At Nay-yay-kan village	At Kandwin village	MNDWQS guideline
1.	Total coliform	10 CFU/100 ml	4 CFU/100 ml	2 CFU/100 ml	3 (0-100 per ml)
2.	Fecal coliform	2 CFU/100 ml	Not detected	Not detected	0 (0-100 per ml)
3.	Colour	5	Nil	Nil	Non-set, TCU 15
4.	Turbidity	9	5	2	NTU 5
5.	Arsenic	Nil	Nil	Nil	0.05 mg/l
6.	Lead	0.02	0.07	0.04	0.01 mg/l
7.	Nitrate	0.5	0.4	0.7	50 mg/l
8.	Manganese	Nil	Nil	Nil	0.4 mg/l
9.	Chloride	3	10	5	250 mg/l
10.	Hardness	166	376	316	500 mg/l (as CaCO ₃)
11.	Iron	0.33	0.36	0.25	1 mg/l
12.	pH	7.3	7.4	7.3	6.5 – 8.5
13.	Sulphate	8	10	12	250 mg/l
14.	Total dissolved solid	173	361	385	1000 mg/l

Note – All are lower than the guide line values except turbidity. The reason why is not exactly known; but the water of Myitnge river is relatively turbid through out the year.

Note – When the project has commenced and the cement factory is in operation the effluent will be measured. Semi-annual monitoring for all physical parameters will be conducted and duly reported to ECD.



Figure – 20: Taking water sample at Myitnge River



Figure – 21: Taking water sample at Nat Yay Kan village



Figure – 22: Taking water sample at Kandwin village

(b) Air quality

The air qualities were measured at the following points.

At factory site, coordinates : N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0".
(Date: 16-1-2024)

At Nat Yay Kan village, coordinates : N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5".
(Date: 17-1-2024)

At Kandwin village, coordinates : N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0".
(Date: 18-1-2024)

Table – 6: Result of air quality at three points

Sr. No	Parameters	Unit	At factory site	At Nat Yay Kan village	At Kandwin village	NEQEG guideline values
1.	Nitrogen dioxide	µg/m ³	24.79	10.25	6.95	200 µg/m ³ (per hour)
2.	Ozone	µg/m ³	0.93	1.15	0.89	100 µg/m ³ (8 hrs period)
3.	PM ₁₀	µg/m ³	35.77	21.94	20.96	50 µg/m ³ (24 hour)
4.	PM _{2.5}	µg/m ³	22.61	9.81	8.96	25 µg/m ³ (24 hour)
5.	Sulfur dioxide	µg/m ³	0.08	0.49	0.06	20 µg/m ³ (24 hour)
6.	VOC	ppb	0.58	0.15	0	NG
7.	Ammonia	ppm	0.14	0.61	1.22	NG
8.	Carbon dioxide	ppm	207.55	212.59	234.23	NG
9.	Carbon monoxide	ppm	0.05	0.05	0.05	NG
10.	Oxygen	%	20.44	20.30	20.41	NG
12.	Wind direction	deg	SE	SE	SW	NG
12.	Wind speed	mph	1.71	0.5	0.71	NG

Note – Virtually all are lower than guideline values.

Note – When the project has commenced and the factory is in operation emission level will be measured. Semi-annual monitoring for all physical parameters will be conducted and duly reported to ECD.



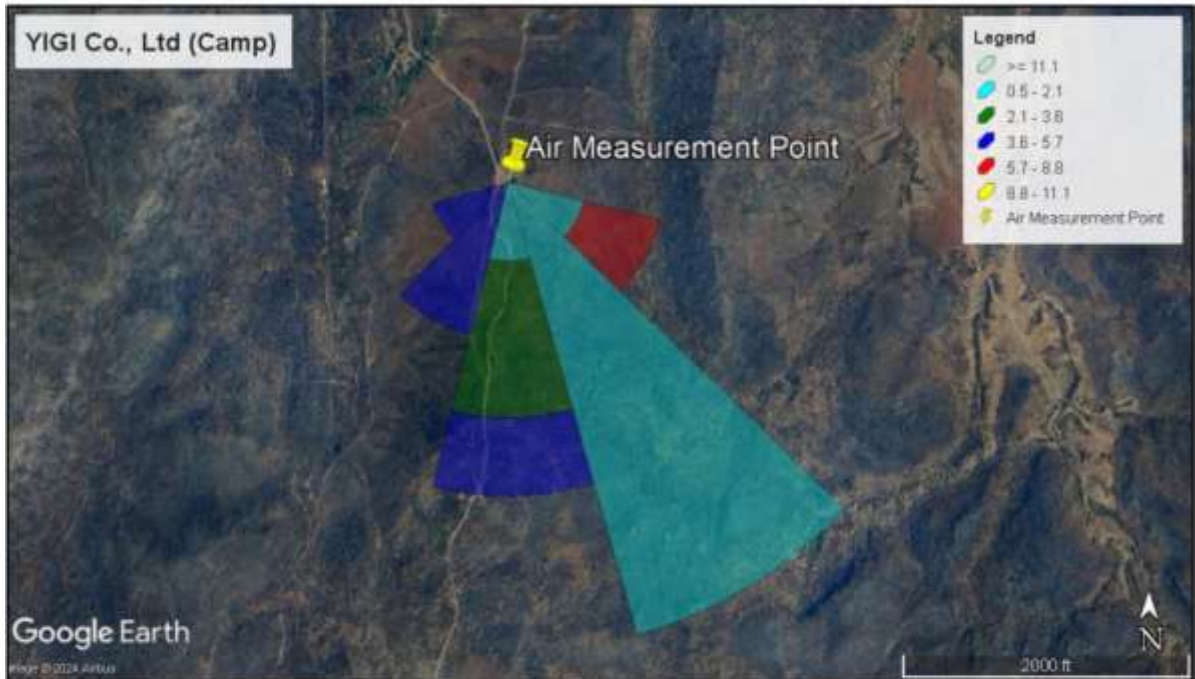
Figure – 23: Measuring air quality at factory site



Figure – 24: Measuring air quality at Nat Yay Kan village



Figure – 25: Measuring air quality at Kandwin village



Wind Speed & Wind Direction (16.01.2024 – 17.01.2024 blowing from)

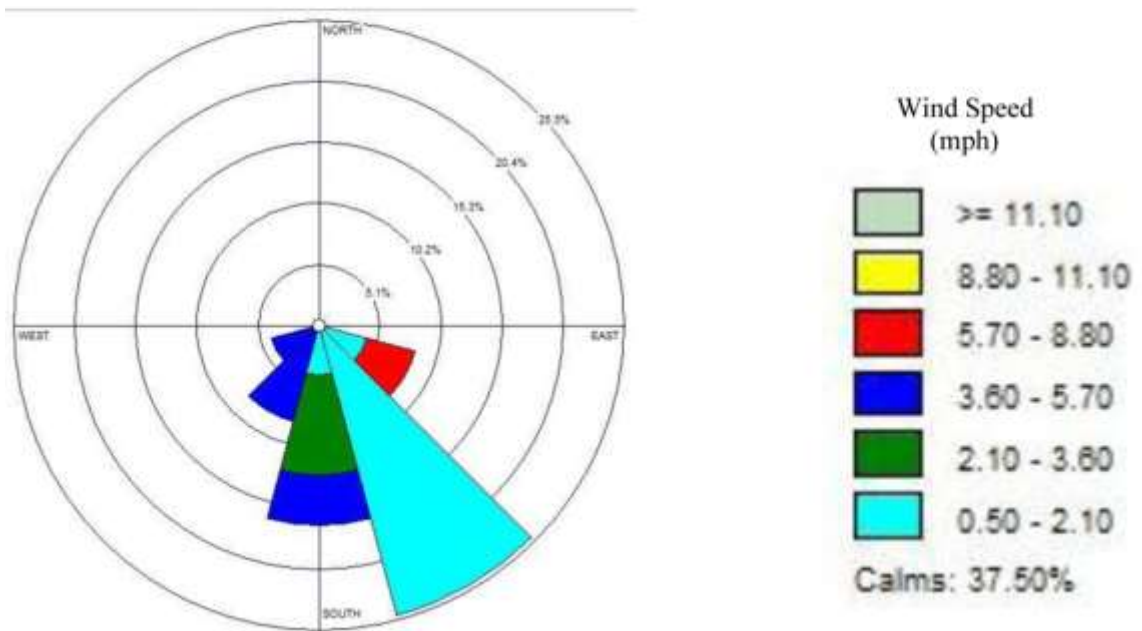


Figure-26: Wind rose map for one day (project site)



Wind Speed & Wind Direction (17.01.2024 – 18.01.2024 blowing from)

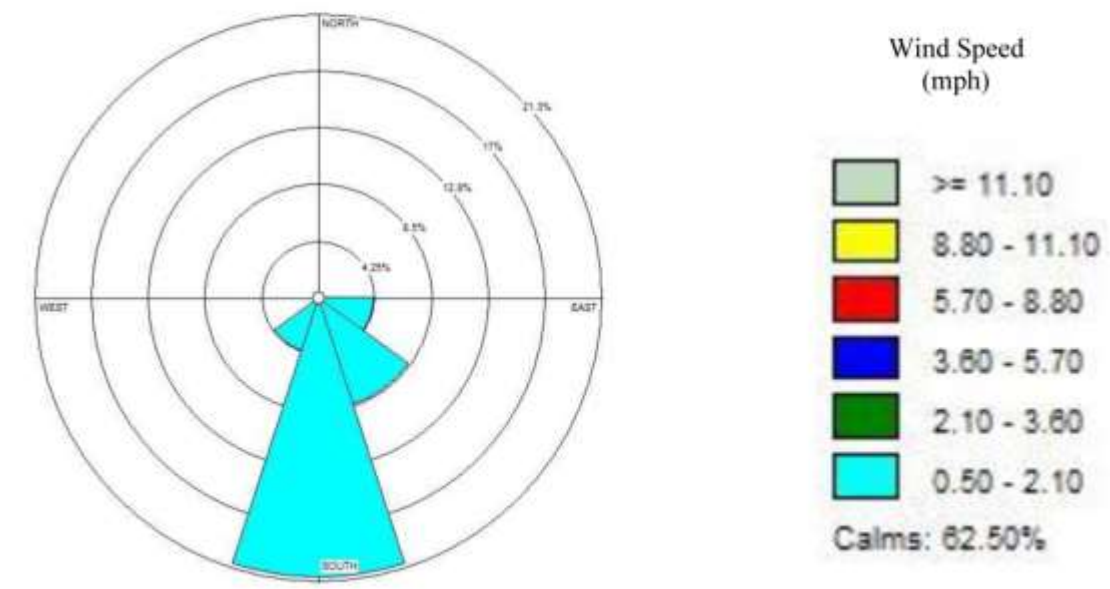


Figure-27: Wind rose map for one day (Nat Yay Kan village)



Wind Speed & Wind Direction (18.01.2024 – 19.01.2024 blowing from)

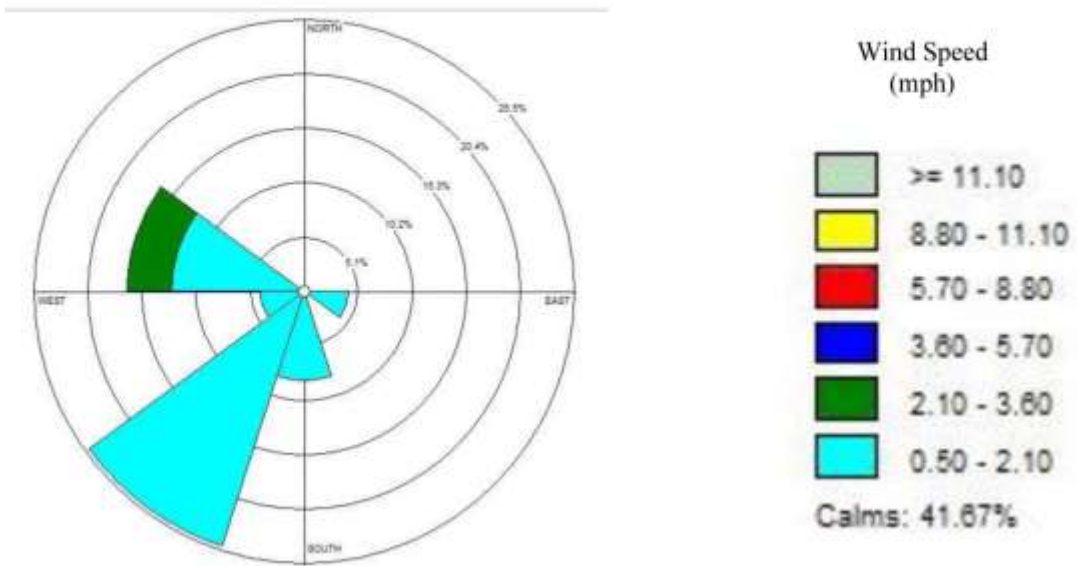


Figure-28: Wind rose map for one day (Kandwin village)

(c) Noise Level

The noise levels were measured at the following points.

- At factory site, coordinates : N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0".
(Date: 16-1-2024)
- At Nat Yay Kan village, coordinates : N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5".
(Date: 17-1-2024)
- At Kandwin village, coordinates : N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0".
(Date: 18-1-2024)

Table – 7: Results of noise level at three points

Parameter	At Factory Stie		At Nat Yay Kan village		At Kandwin village		NEQ guideline values	
	Day	Night	Day	Night	Day	Night	Day	Night
(Residential institutional educational)	38.59	40.63	47.10	43.47	44.98	42.36	55	45
(Industrial, commercial)	-	-	-	-	-	-	70	70

Note – All are lower than guideline values.

Note – When the project has commenced and the factory is in operation noise level will be measured. In addition vibration level is also measured. Semi-annual monitoring all physical parameters will be conducted and duly reported to ECD.



Figure – 29: Measuring noise level at project site



Figure – 30: Measuring noise level at Nat Yay Kan village



Figure – 31: Measuring noise level at Kandwin village

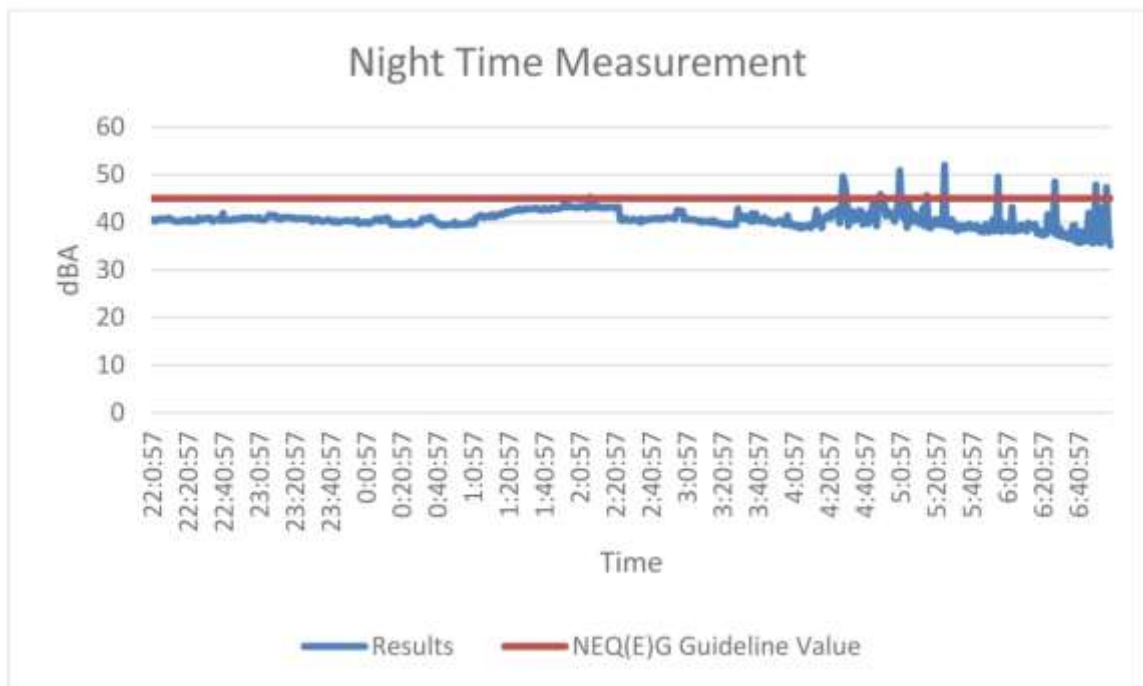
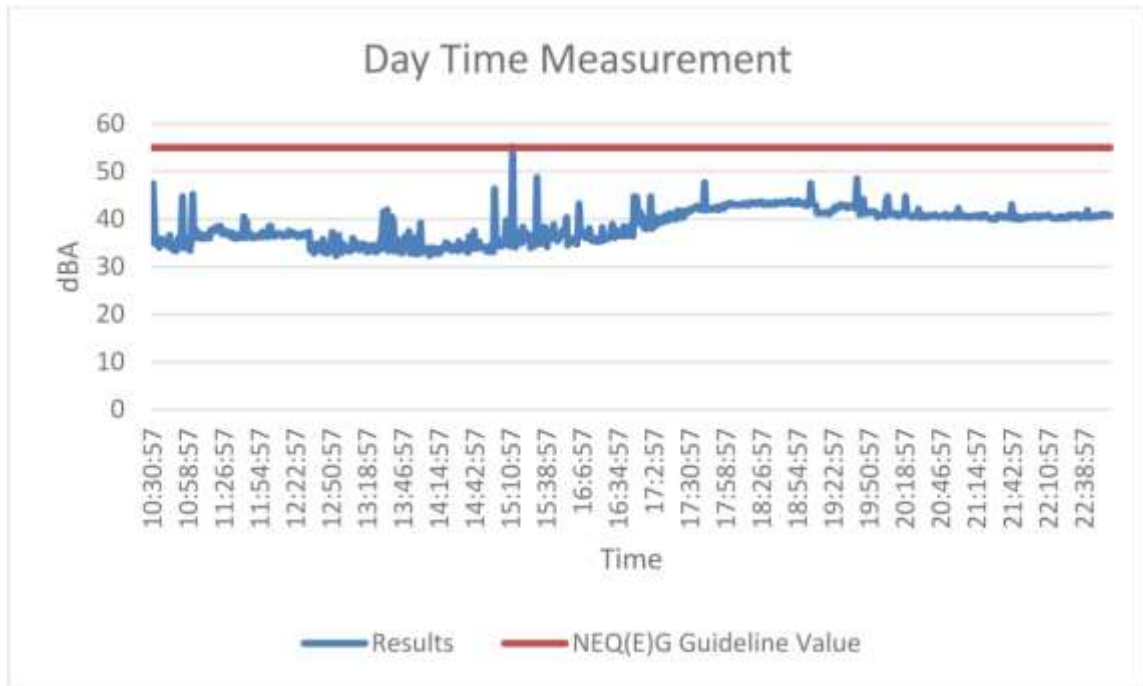


Figure-32: Noise measurement record for project site

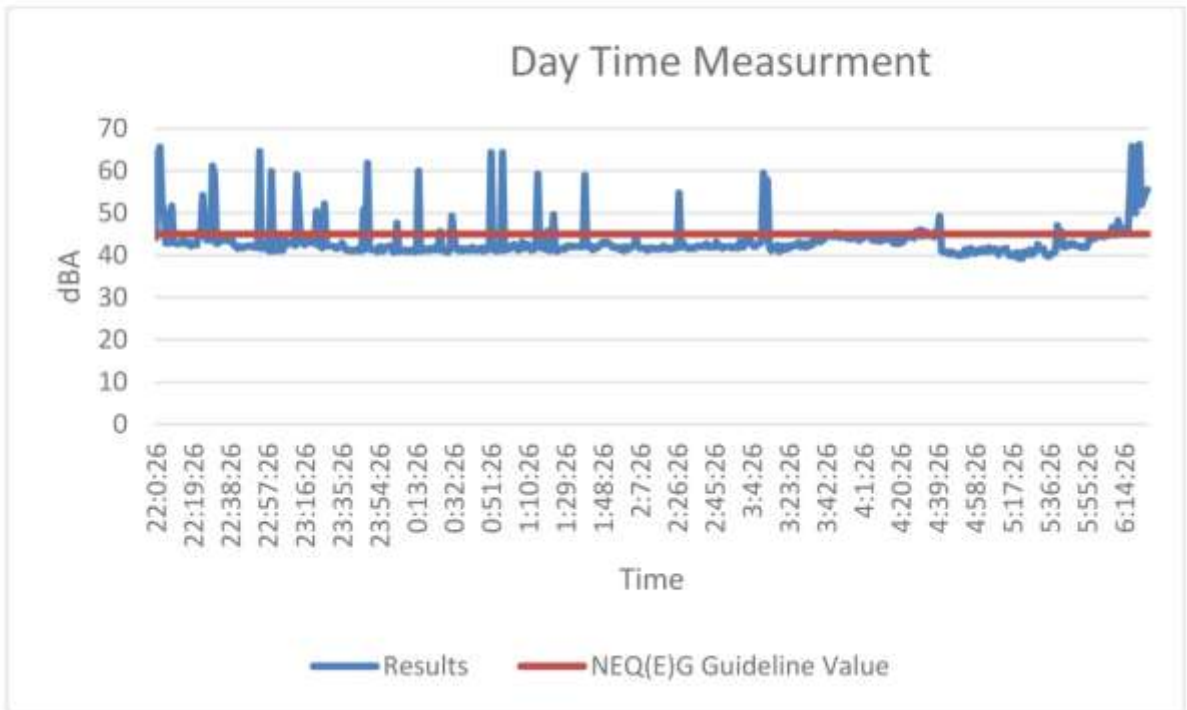
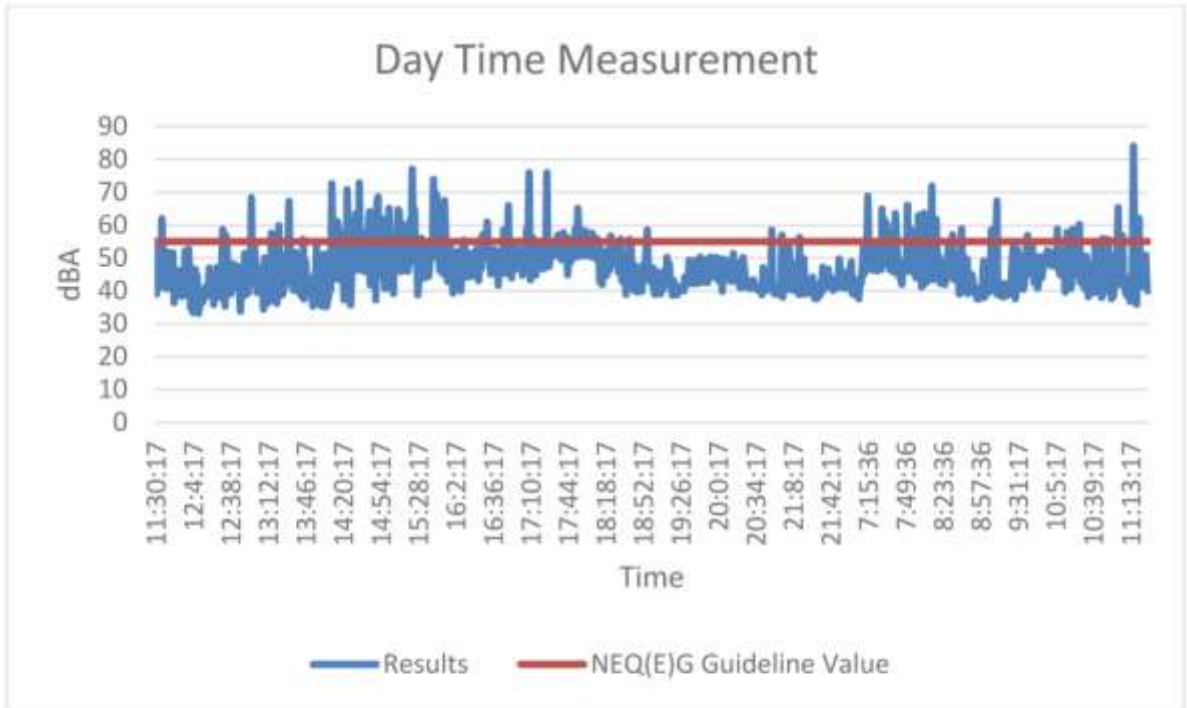


Figure-33: Noise measurement record for Nat Yay Kan village

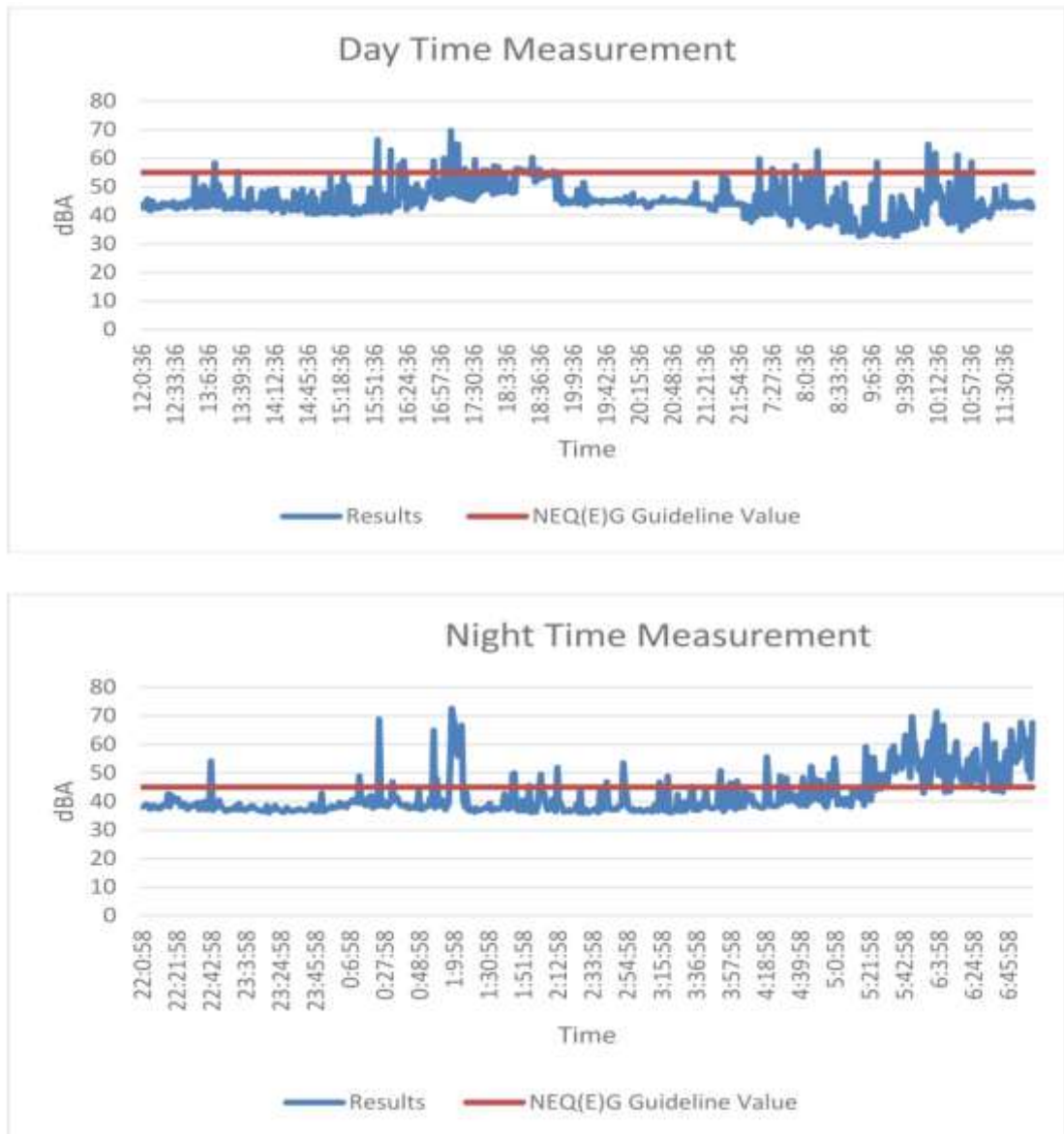


Figure-34: Noise measurement record for Nat Yay Kan village

(d) Vibration

The vibrations were measured at the following points.

- At factory site, coordinates : N. Lat. 21° 44' 46.2"; E. Long. 96° 16' 39.0". (Date: 16-1-2024)
- At Nat Yay Kan village, coordinates : N. Lat. 21° 44' 33.9"; E. Long. 96° 15' 01.7". (Date: 17-1-2024)
- At Kandwin village, coordinates : N. Lat. 21° 46' 52.7"; E. Long. 96° 14' 14.7 ". (Date: 18-1-2024)

The results were for all three points were the same (00.0 mm/s).



Figure-35: Measuring vibration level at project site



Figure-36: Measuring vibration level at Kandwin village



Figure-37: Measuring vibration level at Kandwin village

(e) Soil quality

Soil samples were collected from 3 spots/points, brought back to Yangon and analysis conducted.

The coordinates and data of collection were as follow:

At factory site, coordinates : N. Lat. 21° 44' 44.7"; E. Long. 96° 16' 40.1".
(Date: 16-1-2024)

At Nat Yay Kan village, coordinates : N. Lat. 21° 44' 33.3"; E. Long. 96° 15' 01.8".
(Date: 17-1-2024)

At Kandwin village, coordinates : N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 14.1".
(Date: 18-1-2024)

The results are as follow:

Table – 8: Results of soil quality at three points

Sr. No	Sample plot	pH	Texture	Total N	Available Nutrient
					P
1.	Project Site	Moderately alkaline	Sandy Clay Loam	Low	Very High
2.	Nat Yay Kan village	Moderately alkaline	Sandy Loam	Medium	Low
3.	Kandwin village	Moderately alkaline	Sandy Loam	Medium	Low

Table – 9: Soil analytical data sheet

Sr. No	Sample plot	Moisture %	pH soil: Water 1: 2.5	Texture				Total N %	Available Nutrient
				Sand	Silt	Clay	Total		P ppm (Olsen)
1.	Project Site	4.12	8.02	60.88	27.86	11.26	100.00	0.273	5.42
2.	Nat Yay Kan village	3.09	8.05	65.88	18.86	15.26	100.00	0.288	4.54
3.	Kandwin village	3.11	8.02	59.88	19.86	20.26	100.00	0.144	52.84

Note: All the soil samples are free of contamination by hydrocarbon, SO₂ and any other hazardous substances; mercury cannot be tested.



Figure-38: Taking soil sample at project site



Figure-39: Taking soil sample at Nat Yay Kan village



Figure-40: Taking soil sample at Kandwin village



LEGEND

-  Air quality and Noise level
-  Vibration
-  Water quality
-  Soil quality

Figure – 41: Satellite image showing spots where air quality, vibration and noise level were measured and spots where water and soil samples were taken

5.5.5 Climate

The climate is tropical monsoon climate with a hot and dry season (premonsoon), a rainy season with moderate rainfall (monsoon) and a cool season (postmonsoon). The area also has partially Dry Zone Climate of Myanmar.

The rainy season (monsoon season) generally starts from the middle of June to the end of September. The monthly record for rainfall from 2015-2022 is shown below. The cool season (winter) generally starts from November to and continue till the end of February.

Table – 10: Shows the monthly rainfall and total rainfall of Kyaukse Township during the last eight years (2015-2022) (Unit = inch)

Years and Month	2015	2016	2017	2018	2019	2020	2021	2022
January	0.76	-	-	1.24	1.96	-	-	0.46
February	-	-	-	-	-	-	-	-
March	0.20	-	-	-	-	-	-	4.38
April	1.84	0.88	9.20	1.96	-	-	1.04	2.04
May	9.60	4.88	9.58	6.32	2.73	8.98	3.64	13.04
June	0.84	2.41	0.84	2.46	7.58	3.28	0.38	2.13
July	3.26	0.96	2.86	0.52	2.34	4.06	6.34	3.76
August	7.36	5.84	7.02	3.28	6.54	4.26	6.42	6.20
September	6.56	12.54	5.86	1.98	1.49	0.56	7.02	3.86
October	14.60	2.82	6.56	4.32	4.08	6.14	5.56	5.62
November	-	3.66	2.08	-	1.97	-	-	-
December	-	-	-	1.02	-	-	0.46	-
Total	45.02	33.99	44.00	23.10	28.69	27.28	30.86	41.49

5.5.6 Vegetation cover

Being inside the Dry Zone Region there is no luxuriant forest or luxuriant vegetation. Vegetation cover, generally is low, less than 40% as the vegetation are primarily dry forest, shrubs and scrub land.

The vegetation/forest is also partially or greatly degraded due to anthropogenic activities (human activities).

When the project commence vegetation has to be cleared and more degradation can occur.

Rehabilitation or revegetation is imperative after the Construction Phase.

The vegetation coverage outside the project site such as the foot of the some hills is relatively higher 40-60%.

Big trees such as fruit trees and shade trees can be seen in the village area (all are cultivated tree, not natural areas).

5.5.7 Natural hazards

Earthquake

There was/is no precedent of major or medium earthquakes within memories of 50 years (according to elder villagers/interviewees); only minor earthquakes or tremors.

The major fault line of the country, the notorious Sagaing Fault line running from north to south along the entire length of the country is just west of the site. However, the site is not prone to earthquake.

The Shan Scrap Fault Zone and the Kyauk Kyan Fault line (one of major fault line in Myanmar) are in the east; both are not active fault lines. (That is seismically quiet fault lines).

Floods

Being in the Dry Zone Region with low to very rainfall the area is not prone to excessive rainfall and flooding. Moreover it is in the hilly area with a high altitude of 239 m asl.

Heavy or severe floods are not envisaged. When the unprecedented major floods that wreaked havoc on 11 states and regions of the country occurred in 2015 this area was spared.

The recent major floods in Bago, Ayeyarwaddy and Taninthayi Regions and Mon and Kayin States did not affect this area.

Violent Storms

Generally Myanmar, especially its coastal area such as Rakhine is prone to violent storms and cyclones. But this site is far away from the coast and so not affected by violent storms. The devastated Nargis Cyclone (2008) did not affect this area.

Drought

Being in the Dry Zone Region with very low rainfall drought can be expected. According to the Meteorological Department there were a few years where drought has happened but actually not severe drought.

A glimpse at the meteorological data during the last 8 years did not reveal any noticeable extreme weather events regarding monthly rainfall and monthly temperature. The data did not reveal any evidence to speculate for global warming or climate change. (No sign of gradual increases in mean annual temperature or gradual decrease in mean annual rainfall over the last 8 years.)

5.6 Biological component of the surrounding environment

5.6.1 Floral species

The survey was conducted during the EIA study (January, 2024).

Methodology in brief

The survey work on flora was carried out within the 2 miles radius area in details and also in general out the 2 miles radius area where necessary.

The floral study involves the overall view of the forest and classification of forest type (secondary, deciduous), distribution pattern, if possible, transect walk through the forest, walk around the periphery, and on the spot identification of the species. In other word, the methodology applied is simple taxonomic and ecological study.

No attempt was made to calculate diversity index, species evenness and species richness that involved rather complex formulae intended for pure academic purpose or pure research purpose. After all, most, if not all, trees in the lease area would be gone sooner or later within 30 years as a result of quarry. Effective rehabilitation has to be implemented later.

No attempt was also made to collect the flowers, fruits, leaves of the plants in pressed forma.

Diversity

A total of 97 species of plants were found, identified and recorded. The inventory of plant species is shown below.

Table – 11: Inventory of flora species found in the area

No	Species(Scientific name)	Local name	Family	Habit	IUCN (2023)
1	<i>Acacia arabica</i> Willd.	Sa-phyu-bin	Mimosaceae	T	
2	<i>Acacia leucophloea</i> (Roxb.) Willd.	Hta-naung	Mimosaceae	T	LC
3	<i>Acacia leuco microcephala</i> Graham.	Sha-hta-naung	Mimosaceae	T	
4	<i>Acacia pennata</i> (L.) Willd.	Su-yit-pin	Mimosaceae	C/C	LC
5	<i>Achyranthes aspera</i> L.	Kyet-mauk-pyan	Amaranthaceae	H	
6	<i>Adiantum capillus Veneris</i> L.	Han-tha-yit	Pteridaceae	F	LC
7	<i>Adiantum caudatum</i> L.	Daung-mauk	Pteridaceae	F	
8	<i>Ahutilon indicum</i> (L.) G. Don	Bauk-khwe	Malvaceae	S	
9	<i>Albizia lebbeck</i> Benth.	Kokko	Mimosaceae	T	LC
10	<i>Antidesma bunius</i> (L.) Spreng.	Kin-palin	Euphorbiaceae	T	LC
11	<i>Asparagus racemosus</i> Willd.	Shint-matat	Liliaceae	C	
12	<i>Azadirachta indica</i> A. Juss.	Tama	Meliaceae	T	LC
13	<i>Balanites aegyptiaca</i> (L.) Delile.	Thit-palwe	Balanitaceae	T	

14	<i>Bambusa griffithiana</i> Munro.	Wa-myin	Poaceae	B	
15	<i>Barleria cristata</i> L.	Lake-su-apyar	Acanthaceae	H	
16	<i>Bauhinia acuminata</i> L.	Swe-daw	Caesalpiniaceae	ST	LC
17	<i>Bauhinia racemosa</i> Lam.	Pha-lan-pin	Caesalpiniaceae	T	
18	<i>Bombax ceiba</i> L.	Let-pan	Bombacaceae	T	LC
19	<i>Bombax insigne</i> Wall.	Taung-let-pan	Bombacaceae	T	
20	<i>Borreia hispida</i> (L.) K. Schum.	Gant-galar	Rubiaceae	H	
21	<i>Bridelia ovata</i> Decne	Seik-chi	Euphorbiaceae	ST	
22	<i>Cardiospermum halicacabum</i> L.	Kalar-myat-si	Sapindaceae	C	LC
23	<i>Cassia fistula</i> L.	Ngu-pin	Caesalpiniaceae	T	LC
24	<i>Cassia tora</i> L.	Dant-kywe	Caesalpiniaceae	S	
25	<i>Citrus paradisi</i> Macfad.	Shauk-khar	Rutaceae	ST	
26	<i>Commelina paludosa</i> Blume.	Wet-gyut	Commelinaceae	H	
27	<i>Corchorus aestuans</i> L.	Pilaw-kha	Tiliaceae	S	
28	<i>Corchorus olitorius</i> L.	Pilaw-yaing	Tiliaceae	S	
29	<i>Crotalaria medicaginea</i> Lam.	Pe-yaing-kalay	Fabaceae	H	
30	<i>Croton wallichii</i> Muell. Arg.	That-yin-katoe	Euphorbiaceae	T	
31	<i>Curculigo orchioides</i> Gaertn.	Ka-nyut-net	Hypoxidaceae	H	
32	<i>Curcuma</i> sp. Oromatica Salish	Taw-na-nwin	Zigiberaceae	H	
33	<i>Cyanotis cristata</i> (L.) D. Don.	Not-know	Commelinaceae	H	
34	<i>Cymbopogon clandestinus</i> (Nees ex Steud.) Stapf.	Myat-set	Poaceae	G	
35	<i>Dalbergia lanceolaria</i> L.	Thit-pagan	Fabaceae	T	LC
36	<i>Dalbergia paniculata</i> Roxb.	Ta-pauk-pin	Fabaceae	T	
37	<i>Deimum sanctum</i> L.	Taw-pin-sein	Lamiaceae	H	
38	<i>Dendrocalamus membranaceus</i> Munro.	Wa-phyu	Poaceae	B	LC
39	<i>Derris elegans</i> Benth.	Mi-gyaung-nwe.	Fabaceae	C/C	LC
40	<i>Derris ferruginea</i> Benth.	Mi-gyaung-nwe-sok.	Fabaceae	C/C	
41	<i>Dioscorea alata</i> L.	Myauk-u	Discoreaceae	C	
42	<i>Erythrina arborescens</i> Roxb.	Kathit	Fabaceae	T	
43	<i>Eupatorium odoratum</i> L.	Bi-zet	Asteraceae	S	
44	<i>Euphorbia hirta</i> L.	Kwe-kyauung-min-say	Euphorbiaceae	H	
45	<i>Euphorbia neriifolia</i> L.	Sha-zaung-myin-na	Euphorbiaceae	ST	LC

46	<i>Euphorbia nivulia</i> Buch. Ham.	Ta-zaung	Euphorbiaceae	ST	
47	<i>Ficus obtusifolia</i> Roxb.	Nyaung-gyat	Moraceae	T	LC
48	<i>Grewia asiatica</i> L.	Tayaw-pin	Tiliaceae	ST	LC
49	<i>Grewia hirsuta</i> Vahl.	Kyat-tayaw	Tiliaceae	S	LC
50	<i>Grewia humitis</i> Wall ex. G. Don	Khwe-tayaw	Tiliaceae	S	
51	<i>Haplophragma adenophylla</i> (Wall.) Dop.	Phet-than	Bignoniaceae	T	
52	<i>Hiptage benghalensis</i> (L.) Kurz.	Bein-nwe.	Malpighiaceae	ST	LC
53	<i>Holarrhena pubescens</i> Wall. Ex. G. Don.	Lettok	Apocynaceae	ST	LC
54	<i>Holoptelea integrifolia</i> (Roxb.) Planch.	Pyout-sait	Ulmaceae	T	
55	<i>Hymenodietvon orixense</i> (Roxb.) Mabb.	Khu-than	Rubiaceae	T	
56	<i>Hymenopyramis brachiata</i> Wall.	Chintelet-new	Verbenaceae	C/C	
57	<i>Ipomoea cairica</i> (L.) Sw.	Railway-creeper	Convolvulaceae	C/C	LC
58	<i>Ipomoea hederacea</i> Jacq.	Taung-kunzon	Convolvulaceae	C/C	
59	<i>Jatropha gossypifolia</i> L.	Kyet-su-kano-kno	Euphorbiaceae	S	LC
60	<i>Kalanchoe laciniata</i> (L.) DC.	Mi-malaung-pan	Crassulaceae	H	
61	<i>Lagerstroemia parviflora</i> Roxb.	Zaung-palwe	Lythraceae	T	LC
62	<i>Lagerstroemia villosa</i> Wall.	Zaung-palwe	Lythraceae	T	
63	<i>Lannea coromandelica</i> (Houtt.) Merr.	Nabe	Anacardiaceae	T	LC
64	<i>Lantana comara</i> L.	Sein-naban	Verbenaceae	C	
65	<i>Leptadenia reticulata</i> Wight & Arm.	Gon-new	Asclepiadaceae	C	
66	<i>Livistona speciosa</i> Kurz	Taung-htan	Arecaceae	T	
67	<i>Millettia ovalifolia</i> Kurz.	Thin-win	Fabaceae	T	DD
68	<i>Millettia pachycarpa</i> Benth.	Mi-gyaung-nwe.	Fabaceae	C	LC
69	<i>Mimosa pudica</i> L.	Hti-kayone	Mimosaceae	H	LC
70	<i>Mucuna pruriens</i> (L.) DC.	Kway-layar	Fabaceae	C	LC
71	<i>Pavonia odorata</i> Willd.	Bar-lar-pin	Malvaceae	S	
72	<i>Phyllanthus urinaria</i> L.	Taung-zi-phyu	Euphorbiaceae	H	
73	<i>Premna pyramidata</i> Wall.	Kyun-bo	Verbenaceae	T	
74	<i>Psoralea corylifolia</i> L.	Nay-lae	Fabaceae	H	LC
75	<i>Ruellia tuberosa</i> L.	Naga-maing	Acanthaceae	H	
76	<i>Samanea saman</i> (Jacq.) Merr.	Thin-baw-kokko	Mimosaceae	T	LC
77	<i>Sida acuta</i> Burm. F.	Ta-byat-si-ywet-shae	Malvaceae	S	
78	<i>Sida cordifolia</i> L.	Kat-say-nae	Malvaceae	S	

79	<i>Sida spinnsa</i> L.	Ta-byat-si-pi	Malvaceae	S	
80	<i>Smilax griffithii</i> A. DC.	Khat-cho	Smilacaceae	C/C	
81	<i>Spondias mangifera</i> Willd.	Gway	Anacardiaceae	T	
82	<i>Stereospermum personatum</i> (Hassk.) Chatterjee	Than-tay	Bignoniaceae	T	
83	<i>Stephania discolor</i> Spreng.	Taung-kyar	Menispermaceae	C/C	
84	<i>Stephania versicolor</i> Wall.	Shaw-phyu	Sterculiaceae	T	
85	<i>Tamarindus indica</i> L.	Magyi	Caesalpiniaceae	T	LC
86	<i>Themeda triandra</i> Forssk.	Myauk-mi	Poaceae	G	
87	<i>Tephrosia purpurea</i> Pers.	Me-yaing	Fabaceae	S	
88	<i>Terminalia pyrifolia</i> Kurz.	Lein-pin	Combretaceae	T	
89	<i>Terminolia oliveri</i> Brandis.	Than	Combretaceae	T	
90	<i>Thunbergia grandiflora</i> Roxb.	Pan-yi-sut-nwe.	Acanthaceae	C	
91	<i>Tribulus alatus</i> Delile.	Swe-lay	Zygophyllaceae	H	
92	<i>Urena lobata</i> L.	Kat-say-nae/wet-chi-pane	Malvaceae	S	LC
93	<i>Vernonia cinerea</i> (L.) Less.	Kadu-pyan	Asteraceae	H	
94	<i>Vitex limonifolia</i> Wall.	Kyun-gauk-new	Verbenaceae	T	LC
95	<i>Vitis trifolia</i> L.	Taw-sabyit	Vitaceae	C	
96	<i>Xylia xylocarpa</i> (Roxb.) Taub.	Pyin	Mimosaceae	T	LC
97	<i>Ziziphus rugosa</i> Lam.	Taw-zi	Rhamnaceae	ST	

S - Shrub

C - Climber

H - Herb

C/C - Climber/ Creeper

T - Tree

G - Grass

ST - Small tree

B - Bamboo

The most abundant plants are grass, herb or small plants. As mentioned earlier the forest is dry forest and more like a shrub land or scrub land.

Big trees are very rare, almost non-existent, trees with GBH of 300 cm almost non-existent an assessment of the flora of the area reveals the floral species of dry forest shrub land dominates the area. Dominant and typical trees are Sharr-ha-naung (*Acacia leucocephala*); Slender bamboo (*Bambusa* sp); Let-pan (*Bombax ceiba*); Na-bei (*Lannea coromandelica*); Shaw-phyu (*Stephania versicolor*) and Than (*Terminalia olivveri*).

The local community relies on this dry forest and shrub land for exploitation of fuel woods and certain building materials for small construction works.

A few of the shrub can be of medicinal value but are not too small in quantity and economically not viable.

The activities of the project will cause negative impact on the dry forest and shrub land. Mitigation and above all, reforestation is imperative.

5.6.2 Fauna Species

5.6.2.1 Avian Fauna (birds)

Methodology in brief

High power telescopes, binocular and camera (tele-lens) were the main tools used for avian study.

The whole area designated for survey (about 12.6 square miles) was covered. These were areas north, east, south and west of the site. Focus was also made on the area south east and north west of the site.

The survey work was carried out from 06:30 hrs till dark, with only one recess from lunch. Usually more birds are found in early morning and in the evening.

The work mainly involved transect walk through the forest/bush and visual study. Walk from the site to different directions, namely, to north, east, south and west.

Diversity

A total of 95 avian species were found, identified and recorded.

Inventory of bird species found is shown below.

Table – 12: Bird species recorded in the area

No.	Common New Name	Scientific name	IUCN (2023)
	PHASIANIDAE: PERDICINAE		
1	Chinese Francolin	<i>Francolinus pintadeanu</i>	
	PHASIANIDAE: PHASIANINAE		
2	Red Jungle Fowl	<i>Gallus gallus</i>	LC
	ARDEIDAE: ARIDEINAE		
3	Little Egret	<i>Egretta garzetta</i>	LC
	PHALACROCORACIDAE		
4	Little Cormorant	<i>Phalacrorax niger</i>	
	FALCONIDAE: FALCONINAE		

5	Eurasian Hobby	<i>Falco subbuteo</i>	LC
	FALCONIDAE: ACCIPITRINAE		
6	Oriental Honey-Buzzard	<i>Pernis ptilorhynchus</i>	LC
7	Black -shouldered Kite	<i>Elanus caeruleus</i>	LC
	TURNICIDAE		
8	Barred Buttonquail	<i>Turnix suscitator</i>	LC
	COLUMBIDAE: COLUMBINAE		
9	Rock Pigeon	<i>Columba livia</i>	LC
10	Oriental Turtle-Dove	<i>Streptopelia orientalis</i>	LC
11	Red Collared-Dove	<i>Streptopelia tranquebarica</i>	LC
12	Spotted Dove	<i>Streptopelia chinensis</i>	
	COLUMBIDAE: TRERONINAE		
13	Thick-billed Green-Pigeon	<i>Treon curvirostra</i>	
14	Yellow-footed Green- Pigeon	<i>Treon phoenicopterus</i>	
	PSITTACIDAE: PSITTACINAE		
15	Rose-ringed Parakeet	<i>Psittacula krameri</i>	LC
	CUCULIDAE: CUCULINAE		
16	Plaintive Cuckoo	<i>Cacomantis merulinus</i>	
17	Asian Koel	<i>Eudynamys scolopacaceus</i>	LC
	CUCULIDAE: PHAENICOPHAEINAE		
18	Green-billed Malkoha	<i>Rhopodytes tristis</i>	
	CUCULIDAE: CENTROPODINAE		
19	Greater Coucal	<i>Centropus sinensis</i>	LC
	TYTONIDAE: TYTONINAE		
20	Common Barn-Owl	<i>Tyto alba</i>	LC
	STRIGIDAE		
21	Collared Scops-Owl	<i>Otus lettia</i>	LC
22	Spotted Owlet	<i>Athene brama</i>	LC
	CAPRIMULGIDAE: CAPRIMULGINAE		
23	Large-tailed Nightjar	<i>Carprimulgus macrurus</i>	
24	Savanna Nightjar	<i>Carprimulgus affinis</i>	
	APODIAE: APODINAE		
25	Germain's Swiftlet	<i>Aerodramus germani</i>	
26	Asian Palm-Swift	<i>Cypsiurus balas</i>	LC

27	House Swift	<i>Apus affinis</i>	LC
	CORACIIDAE		
28	Indian Roller	<i>Coracias benghalensis</i>	LC
	MEROPIDAE		
29	Little Green Bee-eater	<i>Merops orientalis</i>	LC
30	Blue-tailed Bee-eater	<i>Merops philippinus</i>	LC
31	Chestnut-headed Bee-eater	<i>Mecops leschenaulti</i>	LC
	UPUPIDAE		
32	Common Hoopoe	<i>Upupa epops</i>	LC
	RAMPHASTIDAE: MEGALAIMINAE		
33	Lineated Barbet	<i>Psilopogon lineatus</i>	LC
34	Coppersmith Barbet	<i>Megalaima haemaccephala</i>	LC
	PICIDAE: PICINAE		
35	Common Flameback	<i>Dinopium javanese</i>	LC
	CAMPEPHAGIDAE		
36	Scarlet Minivet	<i>Pericrocotus speciosus</i>	
	ORIOLIDAE		
37	Black-naped Oriole	<i>Oriolus chinensis</i>	LC
38	Black-hooded Oriole	<i>Oriolus xanthornus</i>	LC
	ARTAMIDAE		
39	Ashy Wood swallow	<i>Artamus fuscus</i>	LC
	GENERA INCERTAE SEDIS:		
40	Common Wood shrike	<i>Tephrodornis pondicerianus</i>	LC
	AEGITHINIDAE		
41	Common Iora	<i>Aegithina tiphia</i>	LC
	RHIPIDURIDAE		
42	White-throated Fantail	<i>Rhipidura albicollis</i>	LC
	DICRURIDAE		
43	Black Drongo	<i>Dicrurus macrocercus</i>	LC
44	Ashy Drongo	<i>Dicrurus leucophaeus</i>	LC
45	Bronzed Drongo	<i>Dicrurus aeneus</i>	LC
46	Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>	LC
	MONARCHIDAE		

47	Black-nape Monarch	<i>Hypothymis azurea</i>	LC
48	Asian Paradise-Flycatcher	<i>Terpsiphone paradisi</i>	LC
	CORVIDAE		
49	House Crow	<i>Corvus splendens</i>	LC
50	Eastern Jungle Crow	<i>Corvus levaillantii</i>	LC
51	Red-billed Blue Magpie	<i>Urocissa erythrorhyncha</i>	
52	Rufous Treepie	<i>Dendrocitta vagabunda</i>	LC
	LANIIDAE		
53	Brown Shrike	<i>Lanius cristatus</i>	LC
54	Burmese Shrike	<i>Lanius colluriooides</i>	LC
55	Long-tailed Shrike	<i>Lanius schach</i>	LC
	NECTARINIIDAE		
56	Purple Sunbird	<i>Cinnyris asiaticus</i>	
	DICAEIDAE		
57	Scarlet-backed Flowerpecker	<i>Dicaeum cruentatum</i>	LC
	PLOCEIDAE		
58	Baya Weaver	<i>Ploceus philippinus</i>	LC
	ESTRILDIDAE: ESTRILDINAE		
59	White-rumped Munia	<i>Lonchura striata</i>	LC
60	Scaly-breasted Munia	<i>Lonchura punctulata</i>	LC
	PASSERIDAE:		
61	House Sparrow	<i>Passer domesticus</i>	LC
62	Plain-backed Sparrow	<i>Passer flaveolus</i>	LC
63	Eurasian Tree-Sparrow	<i>Passer montanus</i>	LC
	MOTACILLIDAE		
64	White Wagtail	<i>Motacilla alba</i>	
	STURNIDAE: STURNINAE		
65	Jungle Myna	<i>Acridotheres fuscus</i>	LC
66	Common Myna	<i>Acridotheres tristis</i>	LC
67	Vinous-breasted Myna	<i>Acridotheres burmannicus</i>	LC
68	Chestnut-tailed Starling	<i>Sturnus malabaricus</i>	LC
	MUSCICAPIDAE: SAXICOLINAE		
69	Eastern Stonechat	<i>Saxicola maurus</i>	
70	Pied Bushchat	<i>Saxicola caprata</i>	LC

	MUSCICAPIDAE: MUSCICAPINAE		
71	Taiga Flycatcher	<i>Ficedula albicilla</i>	LC
72	Oriental Magpie-Robin	<i>Copsychus saularis</i>	LC
73	White-rumped Shama	<i>Copsychus malabaricus</i>	LC
	ALAUDIDAE		
74	Burmese Bushlark	<i>Mirafra microptera</i>	LC
	PYCNONOTIDAE:		
75	Streak-eared Bulbul	<i>Pycnonotus blanfordi</i>	LC
76	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	LC
77	Red-vented Bulbul	<i>Pycnonotus cafer</i>	LC
	HIRUNDINIDAE: HIRUNDININAE		
78	Barn Swallow	<i>Hirundo rustica</i>	LC
79	Red-rumped Swallow	<i>Cecropis daurica</i>	LC
80	Striated Swallow	<i>Cecropis striolata</i>	
	PHYLLOSCOPIDAE		
81	Greenish Warbler	<i>Phylloscopus trochiloides</i>	LC
82	Yellow-browed Warbler	<i>Phylloscopus inornatus</i>	LC
83	Dusky Warbler	<i>Phylloscopus fuscatus</i>	LC
	TIMALIIDAE		
84	Yellow-eyed Babbler	<i>Chrysomma sinense</i>	LC
85	Oriental White-Eye	<i>Zosterops palpebrosus</i>	LC
86	Chestnut-capped Babbler	<i>Timalia pileata</i>	LC
87	Puff-throated Babbler	<i>Pellorneum ruficeps</i>	LC
88	White-throated Babbler	<i>Turdoides gularis</i>	LC
	ACROCEPHALIDAE		
89	Thick-billed Warbler	<i>Acrocephalus aedon</i>	
	MEGALURIDAE		
90	Lanceolated Warbler	<i>Locustella lanceolata</i>	LC
	CISTICOLIDAE		
91	Zitting Cisticola	<i>Cisticola juncidis</i>	LC
92	Common Tailorbird	<i>Orthotomus sutorius</i>	LC
93	Rufescent Prinia	<i>Prinia rufescens</i>	LC
94	Plain Prinia	<i>Prinia inornata</i>	LC
95	Brown Prinia	<i>Prinia polychroa</i>	LC

In term of biodiversity the families Timaliidae and Cisticolidae were the dominant family with five species.

The common birds found are Sparrow (*Passer domesticus*); Common Myna (*Acridotheres tristis*); Vinous-breasted Myna (*Acridotheres leucocephalus*); Spotted Dove (*Streptopelia chinensis*); White-throated Babbler (*Turdoies earlei*); Little Green Bee-eater (*Merops orientalis*); Black Drongo (*Dicrura macrocerus*); Red-whiskered Bulbul (*Pycnonotus jocosus*); Little Egret (*Egretta garzetta*) and Little Cormorant (*Phalacrocorax niger*).

All the birds found are native or indigenous species; none of them are in the migratory category.

All kinds of birds are edible in Myanmar and the local will eat any bird if they have the chance to do so. But there are no bird hunters or trappers, it is learnt.

Species of bulbul and spotted dove are prized as pet birds in Thailand and many local people in the border areas of Kayah, Kayin and Mon States and Tanintharyi Regions are involved in trapping and illegal trading of these birds. But there are no trapping and illegal trading of bird in this area, it is learnt.

The inevitable destruction of the forest due to the project activities will affect the avian fauna to a certain extent. But unlike land animals birds are very mobile and can fly away easily to suitable habitats elsewhere. The area is not isolated but contiguous with other dry forests in the east, north east and east.

5.6.2.2 Herpetofauna (Amphibians and reptiles)

Methodology in brief

As the habitats of amphibian and reptiles on the whole are site specific, for instance, water pools, shady and moist area, under old logs and big stones, and under litters, random survey was conducted throughout the study area.

On the other hand detail survey was concentrated, on the above-mentioned micro habitats or niches. For species that are mainly sedentary, that is, not active wanders, there were specific niches to be studied.

The survey work mainly involved walking and visual inspection. No traps or snares were used. Surveys were carried out twice a day; one during day time and the other one during night. Virtually all amphibians are nocturnal and many reptiles are also nocturnal in habits. They are more active at night and the chance for encounter is much higher. The animals were captured with specially modified stakes, net and scoops. Small rubber rings were also used to shoot at small reptile (lizards and skinks) and small amphibian (frog). The idea was not to kill the small animals but only to daze them by shooting at the head. With the exception of a few to be killed and preserved in formalin or alcohol for later detail study, most were released after observation and recording. The study involved the morphometric characters: - size,

shape, pattern of spots, stripes, colour, body weight and body length. The measurement of length included total length, head, length and width, snout vent length, tail length, scales and scales row (for reptiles). For amphibian the more or less same methods was applied (care has to be taken when handling dazed snakes).

Since herpetofauna tends to inhabit moist or wet spots the survey was mainly concentrated along the bands of dry stream or other ecological riches e.g. under logs, stones among leaves litters, around pools etc.

Diversity

A total of 14 species of herpetofauna belonging to 7 families were found, identified and recorded. 11 species were reptiles while 3 species were amphibian. Of the 10 species of reptiles 7 were lizards and skinks while 4 were snakes. The species recorded were shown below.

Table – 13: Checklist of herpetofauna species recorded from the survey area during survey period

No.	Family Name	Scientific Name	Common Name	IUCN (2023)
1	Bufonidae	<i>Duttaphyrnus melanostictus</i>	Common Toad	LC
2	Dicroglossidae	<i>Fejervarya limnocharis</i>	Paddy Frog	
3	Microhylidae	<i>Kaloula pulchra</i>	Asian Painted Frog	LC
4	Agamidae	<i>Calotes veriscolor</i>	Garden Fence Lizard	
5		<i>Calotes mystaceus</i>	Blue Forest Lizard	
6	Gekkonidae	<i>Hemidactylus frenatus</i>	Asian House Gecko	
7		<i>Hemidactylus garnotii</i>	Garnot's House Gecko	
8		<i>Gekko gekko</i>	Tockay Gecko	
9	Scincidae	<i>Eutropis multifasciata</i>	Common Sun Skink	LC
10		<i>Sphenomorphus maculatus</i>	Spotted Forest Skink	
11	Colubridae	<i>Ptyas korros</i>	Javan Rat Snake	
12		<i>Amphiesma stolatum</i>	Yellow-striped Keelback Snake	
13		<i>Flowea piscator</i>	Chequered Keelback Water Snake	
14		<i>Aheatulla fusca</i>	Vine Snake	

The large majority of reptiles and amphibians were found at night; many were found along the streams or special ecological niches. The foot hill area was a better habitat than the flat terrain, it was noticed.

Frogs were rare as the period was not during the rainy season. The gliding lizards were not found due to scarcity of tall trees in the area.

In term of biodiversity the family Dicoglossidae was the dominant family represented by all individual herpetofauna found.

In term of individual abundance the family Dicoglossidae the total number of herpetofauna found, clearly dominated over all other families.

On the whole the herpetofauna were relatively rare. There is no doubt that more frogs will be found if the survey was carried out during the rainy season.

All the frogs under the family Dicoglossidae are edible and some local people catch them for food, especially during the early part of the rainy season when they are more abundant. But that is done just for household consumption not for commercial purpose, it is learnt.

The local people consume the meat of snake if it is available. However, there are no villagers hunting for snake as in the neighbouring country, Thailand. There is also no illegal trading of snakes for export to China, taking place in the area.

5.6.2.3 Mammalian fauna

Methodology in brief

As the wildlife was very rare and the chance for encounter was exceedingly low no systematic transect line, plots and points were designated.

The survey work mainly involved prowling stealthily in the forest looking for mammals. It was a direct intensive search carrying out day and night. Night time survey was more important for large mammals on ground. Day time survey was good for small tree dwelling mammals, such as squirrels.

The survey method also involved searching for tell-tale signs or evidences such as new or fresh scats, foot prints, scratches, tracks and trails etc. Scats and foot prints are specific and so the animal could be identified quite correctly based on these two evidences.

As wildlife is getting extremely rare it is not possible to observe them during only one survey period. Secondary data have to be gathered from the local elders or old hunters. At least the history of the wildlife of the area can be obtained.

The EIA team have also to rely on the tell-tale signs of wildlife such as foot prints, scats, traces, scratches and resting spots (of course standard methods in biodiversity study).

Another main work was gathering information from hunters (who were very few indeed) and also from old and retired hunters. That was simply gathering secondary data, and looking for recently acquired trophies (horns), leathers and other body parts of the wild animals, if any.

Diversity

The EIA team cannot find any wild mammals during the short trip. But from secondary information it is known that there are Red Muntjac (*Muntiacus muntjak*), Burmese Hare (*Lepus peguensis*) and even Monkey (*Macaca* sp) in the partially degraded forest. Once there were Porcupines (*Hystrix* sp); but longer now, it is learnt. Now only small mammals (Rat *Ratus rattus*, Mouse *Mus musculantus* and Squirrel *Dremomys rufigenis*) remain nowadays.

Aquatic organisms

As there is no water course or water body in the study area (2 miles radius). However there is the Myitnge River in the east. From the secondary information the following species of fish are known to be caught from the river.

Table – 14: Inventory list of fish species recorded

No.	Scientific Name	Local Name	Family Name
1	<i>Amblyharynagodon mola</i>	Nga-bei-phyu	Cyprinidae
2	<i>Anabas testudineus</i>	Nga-byay-ma	Anabantidae
3	<i>Anguilla bicolor</i>	Nga-lin-ban	Anguillidae
4	<i>Channa gaucha</i>	Nga-yant-gaung-toe	Channidae
5	<i>C. striata</i>	Nga-yant	Channidae
6	<i>Cirrhina morigala</i>	Nga-gyin	Cyprinidae
7	<i>Clarius batrachus</i>	Nga-ku	Clariidae
8	<i>Crossochilus latia</i>	Nga-loo	Cyprinidae
9	<i>Heteropneustus fossilis</i>	Nga-gyee	Heterapneutidae
10	<i>Labeo rohita</i>	Nga-myt-chinn	Cyprinidae
11	<i>L. nandina</i>	Nga-net-pyar	Cyprinidae
12	<i>Lapidocephalichirys guntea</i>	Nga-tha-lei-doe	Cobitidae
13	<i>Macrognathus</i> sp.	Mway-na-gar	Mastacembalidae
14	<i>Mastacembelus armatus</i>	Nga-mway-doe	Mastacembalidae
15	<i>Mystus cavasius</i>	Nga-zin-yaing	Bagridae
16	<i>Notopterus notopterus</i>	Nga-pei	Notopteridae
17	<i>Ompok rato</i>	Nga-nu-thann	Siluridae
18	<i>Oreochromis mozambica</i>	Tee-larr-pi-yar	Cichlidae
19	<i>Punticus stigma</i>	Nga-kone-ma	Cyprinidae
20	<i>P. chola</i>	Nga-kone-ma	Cyprinidae
21	<i>Silona childreni</i>	Nga-myinn	Siluridae
22	<i>Wallago attu</i>	Nga-bat	Siluridae

5.7 Infrastructure and services of the area

The infrastructure and services of two villages, namely, Nat Yay Kan and Kandwin villages are summarized in the following tabulated form.

Table – 15: Infrastructure and services of the area

Sr. No.	Infrastructure and service	Villages	
		Nat Yay Kan	Kandwin
1.	<u>Accessibility</u>		
	Motor road	√	√
2.	<u>Access to gridline electricity</u>	- 85% gridline electricity - 15% solar panel	- 85% gridline electricity - 15% solar panel
	Water sources	- water well and bottled water	- water well and bottled water
4.	<u>Education facilities</u>		
	School	Affiliated High school	Middle school
	Number of students/teachers	296/10	173/6
5.	<u>Health facilities</u>		
	Village clinic	√	×
6.	<u>Village library</u>	×	√
7.	<u>Government buildings and/or public buildings</u>	×	×

Sources: Secondary information and KII interview.

- Students who have passed the BEMS go to BEHS in Sintgaing Town.
- The seriously ill or injured are hospitalized at Ohn Chaw Hospital or Hospital in Mandalay City.
- Most local drink water from bottle water; well water is for domestic uses only.



Figure – 42: Nat-yay-kan village



Figure-43: Kandwin village



Figure-44: Tube well at Nat Yay Kan village



Figure-45: Tube well at Kandwin village



Figure-46: Affiliated High School at Nat Yay Kan village



Figure-47: Middle School at Kandwin village



Figure-48: Nat Yay Kan village clinic



Figure-49: Kandwin village library

5.8 Socio-economic components of the surrounding environment (summarized in the tabulated form)

Table – 16: Basic socio-economic aspects

Sr. No.	Socio-economic aspects/parameters	Facts and figures	
		Nat Yay Kan	Kandwin
1.	<u>Population</u>	1365	950
	Number of houses	323	200
	Number of household	323	180
2.	<u>Religion (%)</u>		
	Buddhists	100%	100%
	Christian	-	-
	Other	-	-

3.	<u>Ethnicity (%)</u>		
	Bamar	100%	100%
	Kayin	-	-
	Kayan	-	-
	Others (Shan, Rakhine, Chin)	-	-
4.	<u>Education status (%)</u>		
	Adult literacy rate (%) (mostly primary and Baka education)	80%	75%
5.	<u>Living conditions (Material life style) (%)</u>		
	Brick house (R.C), one storey	5%	8%
	Brick house (walling), one storey	90%	90%
	Brick house (walling), two storey	5%	2%
6.	<u>Materials possession of each household (%)</u>		
	Cars (Nos)	10 Nos.	3 Nos.
	Trawler G (Nos)	30 Nos.	13 Nos.
	Motorcycle (%)	100%	80%
	Television set (%)	85%	70%
	Hand phone (%)	100%	100%

Sources: KII interviews and secondary information and visual inspection.

Note – All houses in both villages are brick house. Timber is very expensive and a brick house is less expensive than a wooden house in this region, they said.

5.8.1 Income and livelihood

The incomes and livelihoods of the locals of the two villagers are shown in tabulated form.

Table – 17: Basic income and livelihood

Sr. No.	Livelihood and income	Villages	
		Nat Yay Kan	Kandwin
1.	<u>Farmers (% of households)</u>	60%	75%
	<u>Main crops</u>		
	Rice	√	√
	Cotton	√	√
	Sesame	√	√
	Ground nut	√	√
	Sunflower	√	√
2.	<u>Working in factories in nearby towns/cities (% of households)</u>	5%	5%

3.	<u>Seasonal jobs/odd jobs (% of households)</u>	35%	20%
4.	<u>Government services (number)</u>		
	Solders	3	-
	Policeman	-	-
	Nurse	-	-
	Teacher	5	-
5.	<u>Annual income per household (in percentages)</u>		
	Less than 10 lakh kyats	30%	35%
	11-20 lakh kyats	30%	25%
	21-30 lakh kyats	20%	15%
	31-40 lakh kyats	10%	15%
	41-50 lakh kyats	7%	8%
	51 and above	3%	2%
	Daily wages (kyats)	Ks 5000 – 7000	Ks 6000 – 8000

Sources – from KII interviews and pre-structured/pre-designed questionnaires.

Note – Just a rough estimated; no household actually knows the exact annual income (no household use banking system).

Note – Unemployment rate is relatively high, 20-25% are working seasonal jobs or odd jobs.

The villagers of two villages, when compared with those in Chin State, northern Magwe Region, and Kayin State, are a little better off.

5.8.2 Land use

The land use of the whole area is predominantly in the form of cultivated land, mostly farm land and few paddy fields, plantation and residential area, the two villages. There is no reserved forest but only shrub land.

The project site was formerly a farm land purchased by the project proponent.

After the establishment of the proposed factory the premise of the factory becomes industrial land use. When the planned factory comes into existence the land use area will increase.

On the whole the land uses pattern of the whole area has changed little during the last couple of decades. As the area is a rural agricultural area every village has sufficient lands for cultivation and most are fertile lands.

Rice, cotton and sunflower is the main cultivated plant while peanut and sesame are other important crops. Each village has common fruit trees and shade trees which are the norm of a rural village.

The land use of Kyaukse Township (from secondary Information)

(a) Cultivated land (acreage)		
Paddy field	-	63,580 acres
Farmland	-	45,017 acres
Garden/orchard	-	1,182 acres
(b) Reserved forest/Protected area	-	248,095 acres
(c) Virgin land	-	1,645 acres
(d) Uncultivated land	-	24,178 acres
(e) Industrial area	-	3,673 acres
(f) Town area	-	524 acres
(g) Villages area-	-	5,048 acres

(Source: Kyaukse General Administration Department)

5.9 Public Health

As typical of rural area of Myanmar, the overall health statuses of the two villages are relatively low (however, in better condition than those villages without village clinic; there are many such villages in the country).

Both villages have a village clinic or rather village dispensary. Villagers have quite easy access to good health facility; Mandalay City is 30 miles away in the north west, while Sintgaing Town is only 10 miles in the south east.

The following table shows the number of cases and patients given treatment at Kyaukse Township Hospital.

Table – 18: List of public health of Kyaukse Township

Sr. No.	Township	Diseases											
		Malaria		Diarrheal		Tuberculosis		Dysentery		Hepatitis		HIV/AIDS	
		Incident	Mortality	Incident	Mortality	Incident	Mortality	Incident	Mortality	Incident	Mortality	Incident	Mortality
1.	Kyaukse	5	-	73	-	1	-	20	-	-	-	233	22

Sources: Kyaukse Township Health Department

5.9.1 Unexploded Ordnance (UXO)

There was no precedent of the local people finding unexploded bombs, shells and grenades or left over old ammunition in the area. And there was no precedent of local people killed or maimed by big mines or small anti-personnel mines.

During the second Great War (WW II) no known battles were fought in the area. During the period of civil war and insurgency that had taking places in most parts of the country the people were lucky not to witness any battle and fighting taking place in the area, it was learnt.

5.10 Cultural components of the surrounding environment (Religious, cultural, historical, archaeological etc.)

Both Nat Yay Kan village and Kandwin village have a Buddhist monastery each.

Both villages celebrate religious festivals on respective religious days, e.g. Kahtina (Kahtein) festival, New Moon Day, the 8th day of the Burmese Calendar months etc.

Thingyan water festival (not a religious festival but traditional festival) is also celebrated.

The two villages have village "Nat" shrines.

Sr. No.	Religious, cultural, historical archaeological attributes etc.	Nat Yay Kan	Kandwin
1.	Village pagoda	✕	✕
2.	Pagoda inside monasteries	√	✕
3.	Village Buddhist monastery number of monks/novices	1 10/3	1 1/3
4.	Village "Nat" shrine	√	√
5.	"Bo" tree or large sacred tree	✕	✕
6.	Historical/archaeological monument	✕	✕

Source: KII interview and visual inspection of the village.



Figure-50: Nat Yay Kan village monastery



Figure-51: Pagoda inside Nat Yay Kan monastery



Figure-52: Kandwin village monastery



Figure-53: Nat Yay Kan village nat shrine



Figure-54: Kandwin village nat shrine

5.11 Visual components of the surrounding environment

As the area is a rural one there is no important or conspicuous visual component to be seen. The normal landscape includes low mountain ranges and hills, and undulating terrain with partially degraded forest. In the west is the wide flat terrain with farm and fields.

Actually there are no beautiful landscapes or spots of aesthetic beauty to attract tourists. There are no historical or religious monuments or outstanding landmarks in this area.

The Mya Leik Taung limestone mountain can be termed the landmark of the area. The proposed project will significantly impact the mountain and its micro-ecosystem. After 30 years of operation large part of the mountain will be gone. This is tantamount to the sacrifice of a small ecosystem for the sake of infrastructural development and hence national

development. And this is the way all developing countries have to be developed and there is no other way around.

During Decommissioning Phase the ecosystem can be partially or wholly restored if meaningful and effective rehabilitation (compensatory planting of trees) can be implemented and the company will do its utmost to undertake this task.



Figure – 55: Mya Leik Taung Mountain

Commitment

Young Investment Group Industry Co., Ltd is committed to running the motor services business without any serious adverse impact on the physical, biological, socio-economic, cultural and visual components of its surrounding environment. Mitigation measures will be duly taken whenever, and wherever necessary.

Daw Hla Myat Thu

Director

Young Investment Group Industry Co. Ltd

6 IMPACT AND RISK ASSESSMENT AND MITIGATION MEASURES

6.1 Impact and risk assessment methodology

Impacts assessment is based from previous personal practical experience and also from theoretical knowledge from available references for conducting EIA. The assessment is based mainly from Experts Judgement/Experts Consensus/Experts opinion and Ad hoc method.

Prediction and identification of the impacts, both negative and positive, and subsequent assessments were made after comprehensive group discussion with EIA practitioners and appraisers.

The visual inspection of the proposed project site was essential for the prediction, identification and assessment of the impacts.

In fact visual inspection is the best methodology for impact prediction, anticipation, identification and assessment.

In addition sense of hearing (acoustic) and sense of smelling (olfactory) are valuable tools for impact assessment. These are internationally accepted practices. The theoretical aspect of impact assessment that involves complex formulae and equations, mathematical and/or computer modelling, computer stimulation are the works of academicians and are beyond the scope of this pragmatic EIA study. These are impressive indeed, but in the real world it can go wrong. Sometimes it is idealistic but not realistic. After all EIA can be conducted without involving this theoretical aspect, especially for a developing country like Myanmar where realistic and pragmatic approach is necessary.

The layout plan and blue prints and details of project specification of the proposed project site plan provided by the proponent have to be studied in meticulous details and memorized until each and every big and small component, could be clearly seen in picture in the mind's eyes of the EIA practitioners and appraisers.

As for pragmatic approach the testing and measurement of air quality, ambient air, PM, SO₂ and NO₂ involved the use of relatively sophisticated and bulky equipment and so technicians have to be contracted. The portable air test kits has the advantage of measuring the in situ (on the spot) condition but not so reliable.

For measuring total suspended particulate matter (TSPM) and Respiratory Particulate Matter (RSPM-PM_{2.5}-PM₁₀), EPAS Air Sampler and EPAS-Haz Scanner with auto sensors were used.

The duration of measurement was 24 hours. (NO₂ was separately measured for one hour. Ozone was measured for 8 hours).

Portable water test kits were also not so reliable and water samples have to be brought back to Yangon for analysis at a registered private laboratory, ISO, TECH Laboratory. The technicians at this laboratory carried out the analysis work.

Noise level was measured on the spot using a portable Digital Noise Level Detector, VICTOR, which was quite reliable. Noise level was also measured by EPAS Scanner. BENE TECH Vibration Meter was used for measuring vibration.

Google earth satellite imagery was applied for the overview of forest structure, general distribution pattern, gradient, opened or canopied forest and which portion will be impacted was determined.

The prediction and assessment of the impacts was based from the team's previous experiences with EIA works on project operations.

To uphold a standard EIA report the impacts assessment are made encompassing all the four phases, namely, Preconstruction, Construction, Operation and Decommissioning Phase. The assessments also cover all the five environmental components of the surrounding environment, namely, the physical, biological, socio-economic, cultural and visual components.

The base line data or background data for the physical, biological, socio-economic, cultural and visual components of environment were carried out. (These were already mentioned in **Chapter-5**). These baseline/background data could be one day in the future compared with the actual impacts during the Construction and Operation Phase.

Predictions and assessments of impact/potential impacts are extrapolated from all the main activities involve in the project. The main activities such as clearing of vegetation for site and access road, the construction activities during the whole Construction Phase and most of all operation activities during the whole long Operation Phase and lastly all activities during the Decommissioning Phase.

Since impacts are the resultants of the above-mentioned activities each and every activity and the resultant impacts are considered, predicted, identified and assessed. Mitigation measure for each and every impact/potential impact is then prescribed.

As the project involved only 500 acres of dry forest, shrub land impact on the biodiversity would be insignificant. Based on the visual inspection of the flora and fauna in general, and on the primary baseline data collected in particular, prediction on the negative impacts on the biological component of the ecosystem was made. Two villages, namely, Nat Yay Kan and Kandwin were incorporated into the study area for prediction of impact on the socio-economic and cultural components.

6.2 Impact and Risk Identification, Assessment and Mitigation

6.2.1 Identification and assessment of environmental impacts

6.2.1.1 During the Preconstruction Phase

Generally speaking there should be no negative impacts during this Pre-Construction Phase. However negative/potential negative impacts of socio-economic aspects can happen as follows:

1) Potential polarization of the locals into pro-project and anti-project groups due to instigation by activists and/or radical environmentalists and mitigation measures to be taken

Instigation and agitation by radical environmentalists who are usually against all infrastructure developments and activists who are usually anti-big business and anti-authority can polarize the locals into pro-project group and anti-project groups.

Agitation by activists can even lead to public outcry and political instability of the region. Whether these activists are doing such thing in good faith, eg- for environment and human rights or doing such thing merely for publicity is sometimes questionable. Certain media are also usually adding fuel to the fire.

On the other hand many big companies in Myanmar usually have little regards for the environment and the community.

This is one of the main reasons why developmental projects are usually objected by the locals who are quite easily swayed by lobby or activists and/or environmentalists.

Mitigation measures to be taken

The project proponent shall take the following measures:

Of course there is no quick fix measure for this social impact. Transparency and the good will show by the company will tackle most of the issues. The Corporate Social Responsibility (CSR) action taken by the Company is an effective measure for solving the issue. Prioritizing the local people for employment in the factory is an effective way of corrective measure for the negative impact. (This is exactly what the company is doing).

Building of good relation between the company and the local community is most important of all. (In this project context this anticipated impact did not happen.)

2) The potential hiking of price of land and property and mitigation measures to be taken

Another main impact is the hiking of the price of land property by greedy speculators. The price of land can go up considerably even before the construction of the factory. Even rumours can lead to the hiking of land and property price. This is happening in location where developmental project are implemented.

Mitigation measures to be taken

The project proponent will take the following measures:

There is no remedy for inflation in price of land and property. The prices of land property are always on the high and this can be only stoically or rationally considered simply as a way of life in this country.

It is important that employees of the proposed cement factory, especially the executive and management members should not personally get involve in land price speculation.

6.2.1.2 During the Construction Phase

The Construction Phase starts after the Planning Phase. In this proposed factory context the Construction Phase lasted two years.

The works during the Construction Phase generally involve the building of access road, the fencing of the site, clearing of land, construction of temporary housing facilities for workers, sourcing of water and electricity, mobilization of materials and workers to site and the actual construction of the factory.

There will be, no doubt, many negative impacts during this phase. The followings are real or potential impacts identified or predicted and assessed.

1) Impact on air environment and mitigation measures to be taken

a) Nature: dust

Dust is the main issue during Construction Phase. Wind direction plays an important role in the impact. The clearing of land and earth works such as excavation, digging and refilling of earth greatly generate dust. Vehicular movement as well as operation of other equipment, engines, pumps and the mixing of cement with sand, lime, water, emit lot of dust. Nuisance and health impact are associated with increased level of dust.

b) Nature: smoke (fugitive emission)

Smoke generated during Construction Phase will be low. The source of emission is from vehicles and some machines used during construction works, such as engines and pumps.

Health impact associated with smoke increased with level of smoke. The emission of Green House Gas can lead to global climate change.

Mitigation measures to be taken

The project proponent will take the following measures:

Mitigation for dust

When clearing the ground vegetation must be removed together (mixed) so that the plant material helps to hold the soil. Or vegetation can be stripped and spread on the newly made soil stockpile; this will minimize emission of dust due to wind. As mentioned earlier, avoid clearing vegetation too far advance of construction.

Spray water regularly for suppression of dust. Plant trees at vacant spots; select hardy, fast growing species and create green zone and green belt. Trees play an important role in minimizing dust; they reduce wind speed and trap a lot of dust.

Provide personnel protection equipment (PPE) such as face mask, nose and mouth cover, to workers exposed to dust during cement mixing and so on.

Mitigation for smoke

Regularly check the engine of vehicles and other machines; well-maintained and operated engines reduce smoke emission; use fuel oil with low sulphur; use environmentally friendly up-to-date instrument, for example, engine with higher fuel efficiency; equip instruments and machines with air pollution control devices to minimize exhaust emission. (These may not be readily available but the company will consider this for the near future.)

Avoid vehicles and instruments left running unnecessary; avoid open burning of solid wastes of all kinds, through segregate, recycle and then for disposal at approved dump site (land fill).

Provide PPE such as noise and mouth covers and face masks to workers exposed to smoke. Trees in the site will effectively sequestrate (remove) CO₂ in the smoke.

Comply with the NEQ guideline values prescribed by ECD. (Described in **Chapter-3**)

2) Impact: noise and vibration and mitigation measures to be taken

During the Construction Phase the source of noise are from construction work such as carpentry work that involve noisy saws and planes, noisy drilling machine and the sound of hammers etc. The noise from cement mixing machine and also from engines and pumps are also high. Movements of vehicles, loading and unloading of materials etc. also produce noise. Concrete roads also produce more noise than tarred ones.

Environmental noise level that is acceptable rating level for noise (International Standard) is around 45 dBA during daytime and 35 dBA at night. Internationally accepted noise level in the work place should not exceed 85 dBA, (ALICE, Frankfurt, Germany 2014).Acoustic environment monitoring performed in Myanmar also follows the standard procedures adopted by American Conference of Governmental Industrial Hygienist (ACGIH) where the acceptable level is little higher than Germany's (EU) standard. Prolonged exposure above 85 dBA can impair hearing and can be a major health impact. Noise generally causes nuisance and disturbance to the community.

Vibration is generated from machinery or mechanical operation during construction work and also from heavy vehicles on the access road. Vibration is usually associated with loud noise; it can damage machines and equipment and also buildings or structures.

Mitigation measures to be taken

The project proponent will take the following measures:

As the cement factory will be isolated (the nearest village is about two mile away) noise is not an issue for the community. Noise can have minor impact on the employees.

The best way to mitigate noise is at its source. Noise specification of equipment and vehicles should be taken into consideration when ordering equipment and vehicles.

All noisy machines and equipment should be fitted with noise muffler or silencers, if possible.. Place noisier machines away from other working units. No construction work at night.

Install temporary noise barrier, if possible, during construction work. Instead of a fence build a 2 m high concrete wall around the premise.

Big trees around the factory and dense vegetation in the site effectively absorb noise.

Provide adequate PPE such as ear muffs, ear plugs etc. to workers at all activities/locations that exceed permissible occupational noise level limit standard (85 dBA).

As mentioned earlier, because the factory will be isolated and away from residential area the noises generated during the Construction Phase are negligible.

Vibration due to heavy truck from road can be mitigated by ensuring a flat and smooth road surface; paved road is much better than unpaved road; tarred road is better than concrete road.

Well-maintained and well-operated machine produce less vibration, therefore, give priority to maintenance and efficient operation of machines. Foundation for the installation of the machine should be firm and durable even for short construction period. This reduces vibration and protects machinery and equipment from damage. It is standard practice to mount machines in such a manner to minimize vibration.

Comply with NEQ guideline value for noise levels prescribed by ECD. (Described in Chapter-3)

3) Impact on land environment and mitigation measures to be taken

During the Construction Phase there can be potential and real impact on soil due to ground clearing, excavation work, digging and moving of large quantity of earth. There can be potential destruction of soil profile by mixing of top soil and sub-soil.

There can be movement of sediment and pollutants into water courses. Erosion was not an issue during the dry months of the years. But it could be an issue if the construction activities are carried out during the rainy season. Silt runoff from the construction operation, the dumping of silt, earth and construction spoils and tailings could have negative impact such as siltation and sedimentation impact on the drainage system and can also cause ground water contamination.

Soil can be compacted due to movement of heavy trucks and machinery. There can be soil contamination and subsequent water pollution due to oil spill and/or chemical spill.

Mitigation measures to be taken

The project proponent will take the following measures:

When doing the clearing work or excavation of earth remove top soil with vegetation (grass, herbs) on it. Stockpile top soil in conical heaps; allow grass and herbs to grow on top soil.

Remove and stockpile subsoil separately. Maintain the topsoil against erosion when filling of earth has to be done; replace, first, the subsoil and then the top soil on top. This will greatly help in greening or landscaping work.

Schedule the construction works so that large area of soil were not laid bare during the monsoon months. Do not clear the land in advance more than necessary. Phase the earth work (in the early period of construction) so that it was limited to workable size only to a minimum area.

Resurface and stabilized the exposed ground surface as soon as possible, that is, after earth work.

To prevent subsequent settlement, drain or ditch must have adequate backfill and after completion of back fill the surface should be restored to its original condition. Severely compacted soil due to repetitive vehicular movement should be raked from time to time.

Manage the overall erosion and sedimentation control during the Construction Phase, particularly during the rainy season.

Rake the soil compacted by heavy trucks and machinery. Restore the soil profile. Avoid spillage of oil and chemical on soil; immediately remove spills, if any.

4) Impact on water environment and mitigation measures to be taken

The company so far relies only on surface water from a river. Although the demand for water during the Construction Phase may not be as high as during the Operation Phase the need for water during the Construction Phase is not so low either. Relatively large quantity of water has to be used in mason work or concrete work such as the mixing of cement, sand, lime with water. The domestic consumption of the water by 200 plus workers can also have impact on the water of the stream.

It is estimated that the daily uses of water during the construction will be just 5% that of the Operation Phase. The domestic consumption by construction workers and staff is also about 2,000 gallons/day. The drainage system is just a temporary ditch with water barely flowing.

Mitigation measures to be taken

The project proponent will take the following measures:

Water conservation and minimization will be practiced. Regularly inspect tanks and pipes for leaks. Minimize use of water by using low consumption appliances. Discipline worker for conservation of water for domestic uses. Harvest rain water for various uses later during the rainy season, if possible.

There is no industrial waste water; small quantity of domestic waste water will end up in the drain and dry up.

Comply with the NEQ guideline values for effluent as prescribed by ECD.

5) Impact of waste disposal and mitigation measures to be taken

Solid waste generated during the Construction Phase will be large quantity of debris in the form of construction tailings, bits and pieces of building materials, iron materials, timber, soft wood, bamboo, used as scaffolds, left over bricks, sand, gravel, and so on.

Many of the leftover materials are unused or surplus materials because even well-experienced planning and design engineers may not be able to estimate the exact quantity of building materials to be used. There will always be unused or surplus timbers, iron rods, cement, brick etc., not to mention iron nails. Unless systematically resold, reused and recycled and systematically disposed of these materials can pose a great impact on the area. After two years of construction work, ill-disciplined workers without good house-keeping practice can also litter the site to a great extent.

As little water will be used during the Construction Phase and as there is no chance of waste water entering the drainage system liquid waste may not be an issue.

Domestic wastes are also generated from the office and worker camp but are of smaller magnitude.

Domestic waste water from temporary housing or camp will go to a small septic tank and associated soak pit. Instead of toilets, pit latrines are provided during the Construction Phase and so there will be no sewage from toilets. From purely environmentalist point of view, pit latrines are not so eco-friendly since it can have impact on ground water. But this is so far the pragmatic way of implementing sanitation during the temporary Construction Phase. Regularly spread earth or ash into the pit to mitigate odour; if any; backfill latrine pit after completion of Construction Phase.

Discipline workers for good house-keeping practice; demand the building contractor to do this and ask him to take responsibility for the conducts of his construction workers.

Mitigation measures to be taken

The project proponent will take the following measures:

Maintain all vehicles and machinery to prevent spill of fuel oil and hydraulic oil. Avoid washing down oil spill with water because this will only help percolate oil underground. Soak oil spill and then dispose the soak at approved disposal site. Saw dust can be also used for soaking oil spills. Pave vehicles and cranes parks and collect run off; bund the fuel depot to prevent spreading of spilled oil.

For disposal of domestic waste water construct a small septic tank together with soak pit to collect the sewage from kitchen, bath etc. Occasionally sprinkle sand or dirt into the pit latrines to mitigate the impact indeed. So the pit latrines may not be a serious issue for ground water as the Construction Phase last for only two years).

6) Impact on biodiversity and mitigation measure to be taken

The first main negative impact during the Construction Phase is on the biodiversity of the area. The clearing of vegetation and land for the site and for the access road will have substantial negative impact on the flora and fauna even though the area was a partially degraded reserved forest. At least some acres of forest or bush has to be cleared first for the construction of the factory. Vegetation on both sides of the dirt road already in existence has to be cleared.

The impact on the biodiversity especially plants is, no doubt, substantial. The clearing of forest or bush, the excavation of earth, the noise and visual intrusion arising from land clearing activities and transportation activities have great negative impacts on the fauna of the area. The more than 200 workers in the construction site during this phase often resulted in increase pressure on living natural resources of the area and the disturbance of the wildlife, due to habitat fragmentation.

The main negative impacts will be in the forms of habitats disturbance, habitat fragmentation, habitat damage, destruction and loss.

Mitigation measures to be taken

The project proponent will take the following measures:

Partial rehabilitation of some parts of the site must be implemented; plant fast growing trees to partially restore the original landscape. Consider for the establishment of green zone or green belt and aesthetic landscaping after the Construction Phase. Leave original big trees, if any, as intact as possible.

Avoid unnecessary clearing of land and cutting of vegetation. The construction should be progressive, that is, implement as soon as a portion of the site is ready for construction.

Do not clear vegetation too far advance of construction. Also avoid unnecessary clearing of land and cutting of trees along both sides of the access road to the factory.

Keep original big trees, intact. Plant trees and grass in vacant spot and consider for the establishment of green zone or green belt.

Prohibit hunting or trapping of wild animals, even small ones including rodents and birds.

Effective planting of trees and grass should be started as soon as the construction works are completed. Refuge area (nesting, resting, breeding and feeding) should be defined for small animals such as birds and rodents.

More trees of various species must be planted during the Operation Phase, not only in the premise of the factory but also in the vicinity. This will help restore the damaged mini-ecosystem of the area. Avoid planting of only one species of economic important plant, for instance, teak. From economic perspective this is viable. But from ecological perspective this will only lead to the emergence of mono-specific teak plantation, which is not ecologically viable. Only a forest with a variety of trees can restore the ecosystem to a certain extent.

7) Occupational Health and Safety issue

The lack of emergency and health service can be a constraint regarding provision of health care for workers in potential emergency. If an accident that effect many people occurs the available service in the area may be prone to inadequate. The township hospital of course, cannot solve such a serious problem. Most of the serious health cases are to be referred to the main hospital in Mandalay. This hospital is about 30 miles away but it has adequate health facility, probably the best public hospital (government institution) in Myanmar. The cost of treatment is not so high.

Natural disasters such as violent storms and great floods are ruled out for this area; there is no precedent of such a disaster within memory. (Earthquake is not taken in consideration. It is a case of the fall of sky as a Burmese saying goes which means all have to suffer if the sky falls, so why bother?) But there can be potential for fire break out as intensive heat has to be used in the plant. (This is discussed in detail in Operation Phase.)

Mitigation measures to be taken

The project proponent will take the following measures:

Careful planning of emergency procedures such as training some workers in first aid and some in fire fighting will be planned.

Provide adequate First Aid Kits and Fire Extinguishers.

For emergency response, organize mock drills for first aid works and also mock drills for fire fighting on a regular basis.

Phone numbers and addresses of nearest Red Cross Society, Ambulance Service, Fire Brigade, Police Station, Clinics and Township Hospital as well as Mandalay Hospital Ambulance Unit must be displayed so that every worker can see easily. (This will be discussed in detail in Operation Phase and EMP.)

Note: During the hectic Construction Phase, where workers are in and out all the time the company has yet to organize One Fire Fighting Training and One First Aid Training with the help of the Township Fire Brigade and the Township Red Cross Society.

8) Potential social illness

This impact can be a two-way impacts. The project which attracts a large number of construction workers can have an impact on the workers which come from different parts of the country. On the other hand, these workers can have an adverse impact on the project.

Such an issue usually occurs during the Construction Phase. When a large number of workers are camped inside the site there is always the potential of the occurrence of undesirable social issues. Some examples are: disputes, quarrels, brawls among themselves or with locals; theft;

misappropriation of materials and money, vandalism, unethical sexual practices or sexual offences and so on. All these have potential to hinder the progress of construction works.

Other socio-economic impacts on the locals will be in the form of

- Physical displacement or loss (of land, property – etc.)
- Potential loss of livelihood, mental agony, change in social structure
- Frictions can occur between the workers and the locals.

Mitigation measures to be taken

The project proponent will take the following measures:

Education and disciplinary action are necessary. Of course the Company is not responsible for this; the building contractor is. The company will demand the building contractor to take responsibility for the conducts of his workers and to undertake disciplinary action. Ask the contractor not to hesitate to take action and apply punitive measures such as suspension or sacking of the wrongdoer.

Keep separate camps (housing) for females and males employees and the two camps should be appropriately far apart.

Ban the drinking of alcohol during working hours; totally ban use of narcotics.

Take punitive action on any wrongdoer (terminating job, sacking).

9) Impact: potential security issue and mitigation measures to be taken

The Construction Phase is the period when it is usually difficult to maintain security. The working atmosphere is rather fluid and dynamic in nature. The in (entering the jobs) and out (quitting the jobs) of workers tend to happen almost all the time. This is the period when cases of thefts, misappropriations and vandalisms happen most.

Unlike the permanent employees during the Operation Phase who are well-disciplined, the temporary workers during the Construction Phase are usually quite difficult to discipline. The building contractor usually has no chance to hand pick them but to select them in haste due to the nature of construction work.

There is always the potential security issue for the cement plant. If left unchecked the construction workers can pose a potential threat for security issue.

Nat Yay Kan and Kandwin villages are 1.8 miles and 3 miles away, from the factory site, respectively. So the factory is not so isolate. Some of the local people may also pose a potential security issue.

Mitigation measures to be taken

The project proponent will take the following measures:

The fencing or walling of the factory compound must be effective and reliable enough to keep the intruders at bay.

Access control must be implemented. Security gates must be set up; set up watch towers if necessary; no unauthorized access is permitted. The company and the building contractor must prohibit the workers from entering the two neighboring villages without preauthorization from the company or the elders of the villages. All entering and leaving of the factory site shall be checked. Do not let the construction workers mingle freely with the locals.

Heavy building materials (which cannot be lifted easily) such as iron bars, iron rod, big timber etc. and materials of less value, for example, bricks, sand, gravel etc. can be piled up in the open. Materials of certain value, for instance, iron work, timber work, frame, iron nails, and associates, corrugated iron sheets, glass panels, bags of cement etc. must be kept in store or warehouse under lock and key.

Ask the contractor to discipline his construction workers.

The condition shall include punitive measures if found to be in contravention of the requirement, for instance, suspension or termination of the employment.

Positive (beneficial) impacts during the Construction Phase

The positive or beneficial impacts during the Construction Phase are in socio-economic aspects. The economic benefits to the region are expected to be substantial.

The proposed project will invigorate and boost the local economy and will bring economic benefits to people who are involve in extraction/production and sale of building materials of all sorts, both raw materials and manufactured goods.

Contractors of raw materials such as sand, gravel and bricks get the chance for doing lucrative and brisk business in providing these raw materials for sales. The extraction or production of these raw materials will also provide jobs for many locals.

Timber merchants and merchants of soft wood and bamboo (for scaffolding) as well as merchants of construction merchandize such as iron rods, bars, iron works and nails, roofing, aluminium sheet, glass panels, cement and so on can promote their sales. At the same time more jobs for the locals can be provide by these merchants; small business men and small sub-contractors will be also benefited by the production, extraction and sale of these building merchandize.

The proposed project will provide jobs for about 200 construction workers for two years. This is quite a substantial contribution to provision of jobs for young people and unemployed

people, partially solving unemployment problem when unemployment is high in the country. Many unskilled workers will have the chance to become skilled workers during the period of one year.

Young Investment Group Industry Co., Ltd will bear in mind that while negative impacts should be mitigated or minimized positive impacts shall be promoted or enhanced.

6.2.1.3 During the Operation Phase

During this long Operation Phase the impacts/potential impacts are long term. The main negative impacts associated with cement production are: the quarrying activities and activities inside the factory.

1) Impact on air environment and mitigation measures to be taken

Dust is generated at the crusher site (jaw crusher, hammer crusher) beside the quarry.

Smoke (gaseous emission) is generated at the quarry site due to activities of excavator, dozer, wheel loader and heavy truck in the form of fugitive emission.

The mined out/quarried out limestone is conveyed to the factory by conveyor belt and so substantial amount of dust is also generated along the conveyor belt line.

At the factory

Large quantity of dust is generated in clinker, cement mill and coal mill; the so-called dust associated with smoke. Cement/clinker dust is the main issue for all cement factories.

Dust is also generated at the packing and storage areas of cement and during the loading of cement on trucks for distribution (and also during transportation if not well-managed).

Generally, the production of 1 ton of Portland cement generates 18.9 kg of PM_{2.5} and 25.2 kg of PM₁₀. (Source from Emission factor) The production of 5,000 tons of cement a day will generate; 9.0 tons of PM_{2.5} and 12.0 tons of PM₁₀.

Vehicular and machinery movements inside the factory compound generate dust. The erosion of ground surface due to strong wind generates dust. Strong wind can also generate dust from coal stockpile and temporary stockpile of cement dust and ash.

Smoke (emission) is mainly generated from the stack in the form of point source emission. Other sources are at the kiln and from clinker cooling.

Point source emission (stationary emission) of smoke from the stack is the main emission of the cement plant. If not mitigated and controlled billows and billows of dark smoke will be spewing out of the opening of the stack. However, due to mitigation measures (installation of 58 bag filters, complete combustion, limestone burning which is effective desulphurization etc.) Dark smoke is not generated; only light gray or vapour like white smoke generated and easily dissipate.

The Area of Influence (AOI) can be almost within the two miles radius. (Theoretically AOI will be much more than 2 miles radius, if mitigation measures not taken). The prevailing winds such as N.E. Monsoon and S.W Monsoon winds are not predominant here as the area is far away from the coast and is sheltered by mountain ranges.

Vehicular movements and operation of machinery inside the factory compound also contribute to gaseous emission (smoke) in the form of fugitive emission.

Discriminate burning of debris and trash also generates smoke.

Dust components usually include heavy metal (lead, mercury, and cadmium), thallium, iron oxide, calcium, carbon, and manganese, silicon compounds etc. dust is mainly in the form of suspended particulate matter (SPM or PM). The smaller PM such as PM_{2.5}, PM₁₀ (also called Respiratory Particulate matter, RPM) post more health hazard than the larger PM.

Although heavy metals in soil and water are quite detectable it is not practical to measure heavy metals in dust and smoke. The hired technicians are in no position to measure this. They are not yet familiar with the unit used for measuring these parameters.

Emission from smoke stack includes mainly SO₂, NO_x, NO₂, CO, CO₂, methane, ozone, hydrocarbon and PM, mainly the smaller PM_{2.5}. Smoke therefore poses more risk than dust.

CO₂ is the main greenhouse gas that can lead to global warming and subsequent climate change. NO_x, methane and Ozone are also important greenhouse gases; while water vapour also directly contributes to global warming. The clearing of vegetation for the implementation of the project also can lead to global warming. Plants store carbon (known as carbon sink or carbon stock), therefore, when forest are cleared not only forest and habitat is lost but also carbon sink/stock is lost. Plants sequester CO₂ and therefore, when plants are lost more CO₂ will be released into the atmosphere and eventually leading to global warming.

Mitigation measures to be taken

The project proponent will take the following measures:

(a) For dust

- Comply with ECD's NEQ emission guidelines. (already mentioned in **Chapter 3**)
- Spray water for suppression of dust - e.g. at crusher area, on dusty road, dusty work area. Water spray can reduce the generation of dust to 90%, it is learnt.
- Sweep the work site clear of dust from time to time; sweep the road surface, and sweep the cement packing area regularly.
- Use tubular conveyor belt rather than open belt, if possible.
- Minimize drop height during loading and unloading of materials --- eg. limestone, coal, cement bags.
- Cover trucks loaded with coal, gypsum, cement etc with tarpaulin to prevent spread of dust during transportation.

- Reduce the speed of vehicle on dusty road. (A reduction of speed from 30km/hr to 25km/hr can reduce the generation of dust to 50%, it is learnt).
- Maintain the stockpiles of coal, cement dust, ash at a minimum height to reduce wind erosion that generates dust (The roofing of the shed shall be low and curve in shape to reduce wind effect).
- The cement dust/clinker dust collected during manufacturing process can be recycled, if that is feasible or use as construction material.
- Ash can be also re-used as additives in cement manufacturing, it is learnt.
- Trees trap dust and therefore plant trees in all available space.
- Provide adequate PPEs, e.g. face masks, nose and mouth covers for workers exposed to long hours of dust.

(b) For smoke (gaseous emission)

- Comply with ECDs NEQ emission guidelines.
- Apply closed equipment and closed storage design to mitigate emission.
- The company will apply 58 bag filters; the stack is 100 m high.
- Ensure the efficient burning of coal (Effective burning at a constant high temperature). Complete combustion, can result in minimization of smoke and ash, denitrification and also minimization of many harmful substances, compounds and element, such as furans and dioxins, it is learnt). Complete combustion can also mitigate heavy metals to some extent, it is learnt. Keep the coal dry; use a coal dryer, if possible.
- Select coal with low sulphur content to reduce emission of SO₂ and NO_x, if that is possible (Grade I anthracite coal is not available in Myanmar; only subbituminous coal is available. The sulphur content is relatively low 0.4 wt. %).
- Desulphurization by dozing lime water (wet scrubbing) is not necessary because large quantity of limestone, CaCO₃, CaO, is burnt in the process. CaCO₃ and CaO are themselves are efficient desulphurizers.
- Avoid open burning of debris and trash inside the factory premise; use incinerator if necessary or regular dispose the solid waste at the approved landfill rather than burning it.
- Limit the use of vehicles, moving machinery inside the compound to reduce fugitive emission.
- Test air quality semi-annually.
- Provide adequate PPEs; face masks, nose and mouth covers to workers exposed to long hour of smoke and gas emission.

(It is not yet feasible to reduce or minimize CO₂ emission or carbon emission. The harsh reality is that the global economy as well as National Economy cannot survive without carbon).

It is estimated that for every ton of Portland cement produced:

- About 700 kg of CO₂; 0.5kg of SO₂ and 1kg of NO_x are generated, it is learnt. The factory with a capacity to produce 5000 ton of cement per day can therefore emit up to 3500 ton CO₂/day.

2) Impact: noise and vibration and mitigation measures to be taken

Activities at primary and secondary crushers generate loud noise (can be up to 100 dBA). But the high level of noise is continuous throughout the crushing activities. In fact the crusher department is the noisiest spot. In the factory compound the main noise generating sources are generators and compressors and noise level are more than 90 dBA. Kiln burner and cement mill also generate high level noise (90-100 dBA each) (from .ref). On the whole the noise level inside a cement factory is low or relatively low.

The noise level in the control room is about 60-65 dBA.

Vehicular movements and movement of heavy machinery also generate noise.

Increase of ambient noise level will cause disturbance or nuisance for the employees, but working in noisy workplace for long hours can impair hearing.

There can be damage to local structures due to vibration. Vibration and loud noise are one way or another, associated.

Mitigation measures to be taken

The project proponent will take the following measures:

Provide adequate PPEs such as ear muffs, ear plugs and ear protectors for employees at the crusher departments (noisy locations that exceed permissible occupational noise level limit standard.)

Select low noise equipment; install mufflers at air inlets or outlets of the fan and air compressors. Install sound insulation cover (lattice work of woods) or barrier wall of the work place. Place noisier sources farther away in overall design.

The crusher department is far away from the main factory and office where most employees are concentrated. (Actually it is not practical to mitigate the high noise level generating from a crusher. it is also not practical to install barrier wall around a crusher. The only plausible way of mitigation is provision of adequate PPE, ear plugs, ear muffs for workers at the crusher.) Build sealed or semi-sealed workshop, if possible.

Heavy trucks and heavy machinery also generate loud noise and vibration. Reduce the speed of heavy trucks when driving inside or in the vicinity of the factory compound. Ensure that the surface of the road is smooth to reduce vibration effectively. Install silencers/noise abators on trucks and machinery, if possible. The installation of air-conditioned cabins for excavator and/or dozer operators is affective.

Conduct regular noise monitoring to ensure that noise level during all times are within noise exposure standard. (Portable small noise test kit is very useful.)

For mitigation of vibration install vibration insulators or vibration absorbers (shock absorbers) on machine that vibrate violently. Prolonged vibration can damage machinery and instruments.

Suitable foundation design should be implemented at the earliest Planning Phase of the project, for the long term operation. Vibration in the vicinity shall be below acceptable level.

Activities inside the factory compound and at the crusher cannot be heard from Nat Yay Kan, the nearest village.

When the factory is in full operation again and when the semi-annual monitoring have to be conducted then the monitoring of noise level and vibration be conducted again and incorporated into the semi-annual report (to be submitted to ECD).

3) Impact on land environment

The solid and liquid wastes (industrial and domestic) can have impact on the land environment.

Mitigation measures to be taken

The project proponent will take the following measures:

- Always check erosion and flooding during the rainy season.
- Avoid dumping of solid waste on ground; use landfill.
- Also avoid dumping of liquid wastes
- Avoid oil spill by all means; should oil spill occur remove immediately with absorbent
- Take utmost care not to cause collateral damage to the surrounding.

4) Impact on water environment and mitigation measures to be taken

Even though the manufacturing technology is switched from "wet process" to "dry process" the factory still has to utilize huge quantity of water. This will still have high impact on the water resource of the area. The domestic consumption of water has also substantial impact on the water resources.

Water will be sourced from Myitnge River and availability of water is not an issue.

The waste water associated with the operation of the factory is negligible. All the water drawn up for production work is recirculated through cooling station and virtually used up (Dry process needs much less water than wet process). So there is almost no industrial waste water to impact the surrounding area. (The NEQEG guideline for industrial waste water for cement factory mentioned only; pH, temperature increase and total suspended solids, - no other compounds).

The domestic waste water flows through the drainage system into septic tank and adjoined soak pit.

Mitigation measures to be taken

- no discharge of untreated waste water into the open or into Myit nge river.
- drain domestic waste water (and industrial waste water, if any) into common water treatment tank or septic tank (or soak pit for domestic water)
- drainage system to separate waste water from storm water which can be reused without any treatment
- wash vehicles and reuse as much water as possible (more than 90% re-circulated and also aim for zero discharge for ideal cement plant)
- only about a fraction of water will be discharged, most will be used for manufacturing cement.
- recirculate used water through cooling station, cooling ponds (ground tank).
- reuse crude re-circulated water for dust suppression and for watering plants
- used water will be for washing vehicles and machinery
- consider for procurement of water test kits and consider for waste water testing at certified laboratory annually or bi-annually.

5) Impact of wastes and mitigation measures to be taken

At the factory

The main industrial wastes at the factory are the cement dust/clinker dust and ash. As all the raw materials, limestone, clay and laterite are physically and chemically transformed totally into clinker there is little industrial waste left, only small quantity of cement/clinker dust and ash.

Generally, the production of 1 ton of Portland cement generates 18.9 kg of PM_{2.5} and 25.2 kg of PM₁₀. The production of 5,000 tons of cement a day will generate; 9.0 tons of PM_{2.5} and 12.0 tons of PM₁₀. (based from reference; emission factor for cement, from Internet). Virtually all are retained on 58 bag filters. (Kiln operation is a closed circuit process (not an open circuit process). Therefore there is no chance of coal ash generating outside the kiln, but mix with clinker. The coal feeding system pushes the coal powder into kiln shell (kiln chamber) and complete combustion take place, resulting in the accumulation of small quantity of down ash of the bottom).

Cement dust will be totally reused.

Cement dust is also generated from packing area, storage area and at loading (on truck) area. Less than 5 kg is generated per day due to accidental spillage.

Office waste from the office and environs and domestic waste from staff quarters.etc are also generated. On the whole office waste is small in quantity but the domestic waste from the staff quarter is quite substantial.

Regarding domestic solid wastes it is observed that on the average 17 kg of domestic wastes (mostly kitchen waste organic waste) will be generated per day.

As regards waste water there is minimal industrial waste water. The used water is recycled through cooling tower. The dry process uses up almost all water and little is left of industrial waste water. However due to the magnitude of the production capacity up to 3630 m³ of water has to be used. After recycles about 363 m³ finally end up as industrial waste water. The office waste water is minimal while the domestic waste water at the staff quarters e.g. kitchen waste water, sanitary waste water are quite substantial. It is estimated that about 120 m³ of domestic waste water/used water will be produced daily. (The NEQEG guideline for cement factory; effluent mentions only such parameters as pH, increased temperature and total suspended solid; in other words there are no chemical compound).

Mitigation measures to be taken

The project proponent will take the following measures:

- Construct a temporary dumping site or a permanent landfill for dust and ash generated from the factory and discarded at the landfill dug by the company. The company has reused the cement dust for recycle and also reused ash as additive for cement production. Only negligible quantity of ash has to be discarded at the landfill.

- Cement dust from packing area will be retrieved and reused.
- Train workers for the systematic collection, storage and disposed of the waste.
- Used bag filter and other discarded objects are collected in waste bins and disposed at the landfill.
- Used fuel oils, engine oils are collected in old drums and give away to other value want it.

As regards domestic waste (at office and at staff quarter):

- Separate waste into at least two categories – recyclable and non-recyclable
- Calculate waste generated on a weekly or fortnightly basis
- Avoid disposal of solid waste into the open, inside or outside the factory compound
- Avoid open burning of waste; use incinerator, if available. (The company does not incinerate its solid wastes, but discard them at a landfill inside the compound). The landfill was dug/constructed with aid of excavator; solid (industrial plus domestic) are discarded; earth or sand are regularly spreaded over the discarded waste. When a landfill is full another new one will be constructed as a new landfill).
- Follow the 5Rs principles of waste minimization (reduce, reuse, recover, recycle and redesign).
- Educate and train workers for handling of waste and also for good housekeeping practice.

As regards waste water:

- Avoid discharge of waste water into Myitnge River by all means.
- Black waste water (from toilets) will drain and end up into septic tanks and soak pits. (The company does not have special treatment for this). There will be septic tanks and soak pits inside the factory compound and also at the staff housing area. There can arise certain negligible odours from there spots, but special treatment for odour not necessary. Deodorants are kept only in toilets.
- Brown waste water (from office, housing, kitchen) will drain into the drainage system and into collector sedimentation pond and dry up.
- Water use for washing machinery and vehicles can be reused--- eg. for dust suppression and for watering plants
- Educate and train worker for minimization of water use in the first place.
- Test the water quality as well as effluent semi-annually.(hired technicians)

6) Impact on traffic and mitigation measures to be taken

As the production capacity will be 5000 tons/day (and 10000 tons/day 2 lines) the logistics of procurement of raw materials, coal from Kalaywa, Naung Cho and Padann and Gypsum from Maukmai and Thibaw will also increase approximately four-folds. In the same way the logistics for the delivering of cements will also increase. These will have substantial impact on the traffic.

The company has kept few trucks of its own but relies on the contractor basis for the procurement of raw material and the distribution of cement.

As the demand for cement is always high cement traders usually come with their own trucks or hired trucks right to the company warehouse and buy bags of cement right away. The company has also a distribution centre in Mandalay.

As the trucks of the contractors or traders are not under the control of the company the mitigation measures for the impact on traffic are, of course, not necessary.

However, the company shall at least take responsibility on the traffic on its 10 miles access road.

Mitigation measures to be taken

The project proponent will take the following measures:

- Set up sign board at road intersection (of access road and highway) to direct heavy truck drivers to reduce speed at this intersection.
- Vehicular movements to be scheduled to avoid peak hours.
- Heavy trucks with big load to be travelled at reduced speed.
- Educate the company drivers in defensive driving.
- Also ask all other truck drivers who are involve in the transportation of the raw materials and the finished products (cement) of the company to comply with rules regarding Highway Law, 2000.
- Keep a log book each for all company vehicles.
- Check the arrival of all trucks loaded with raw materials (coal, gypsum etc.) and the departure of all trucks loaded with cement bags; and also arrival and departure of all office cars.
- Cover the haulage/load with tarpaulin to prevent spilling.
- Do not overload the truck; comply with regulation.

7) Occupational Health and Safety issue, and mitigation measures to be taken

This is already addressed in the Construction Phase. But the potential impacts during the Operation Phase are long term. When employees are working at a workplace for many months attentiveness tends to slacken and cases of accidents and emergencies can occur from time to time.

The lack of good engineering practice, good working practice good house-keeping practice, good safety practice and lack of health education and awareness and hygiene can all lead to undesirable consequences and have negative impacts on the project.

Exposure to heat at the kiln is a significant issue. Although the performance of kiln is remotely regulated and controlled at the control room workers have to be exposed to the intense heat from time to time. As the performance of kiln is remotely regulated and controlled instance heat is not a serious issue. (However, there are rare cases of kiln major explosions abroad and main cause is intense heat). The most serious issue is exposure of kiln dust that can cause damages to eyes and skin. Kiln releases VOC into the air, many are toxic. Inhalation can lead to lung damage. Another possible hazard is fire and explosion at kiln. There are precedent of kiln explosions in other countries causing injuries and fatality e.g. India.

Another potential hazard is major fire and explosion at fuel depot. Accidental fuel oil spills and leaks can cause ignition and eventual fire and explosion. Electrical faults, if any, nearby can cause fire and explosive. Fuel depot will be the most secured and safe-guarded area, furnished with adequate warning signs. In the same way the magazine is the most secured and safe-guarded area.

Another main issue is inhalation of cement dust clinker dust which is the biggest issue. Air pollution is the main hazards in a cement factory.

Another hazard is exposure to high level noise at the crushers.

Other common hazards are eyes, skin and respiratory track irritation (due to dust, ash); inadequate safety guards on machine/equipment; trips, slips and falls, minor or major accidents due to contact with moving rotating and reciprocating machinery. (In fact all parts of the machinery which move while the machine is working are hazardous).

Mitigation measures to be taken

The project proponent will take the following measures:

- Create a safe working place and safety working environment in the first place.
- All workers must pass a medical examination prior to being employed.
- Remotely control pyro-processing works at kiln.

- Hot work permit may be necessary for workers exposed to long hours of heat.
- Educate train and supersize workers for good working practice, good safety practices, good housekeeping practice and good hygiene practice until all these good practices become good habits that ingrained in their mind sets.
- Especially Good safety practice for the storage, handing uses of explosive and fuel oil.
- Educate them for awareness of hazards (from moving, rotating machinery and hot work places).
- Try to maintain zero machinery and vehicular accidents.
- Provide adequate PPEs for workers that are exposed to dust, smoke, loud noise, and heat etc. e.g. helmet, mask, gloves, boots, outfits for workers exposed to intense heat; ear muff, and ear plugs for those exposed to high level noise etc.
- Implement safe and effective procedure for storage and transport of hazardous materials, e.g. explosive, fuel oil.
- Bund storage area of fuel, (The company will have a fuel depot). The fuel depot will be fenced and adequate warning signs installed; working manual for fuel oil handling will be kept.
- Train workers for the safety handling of fuel oil; and also laboratory personal for handling of laboratory chemicals, although very small in quantity.
- Basic first aid and basic Fire fighting trainings for workers. First aid treatment training lifesaving and rescue training and plan for prompt admission to the nearest hospital.
- Provision of fire fighting suits and equipment (fire engine, truck), water jet pumps, installation of hydrants around the plant; water ponds to be always filled with water etc.
- Provision of adequate First Aid Kits; provision of adequate drugs and medicine and tool at the factory clinic.
- Training and drill work on emergency procedures including contingency measures.
- Effective emergency response plan (including displaying of phone number and address of nearest Fire Brigade, Ambulance Service, Hospital and Police Station).
- To take out Insurance for the Cement plant and Insurance for Fire; Life Insurance for each and every employee shall be taken into consideration.
- Train workers for awareness of health and hygiene; awareness of hazards and awareness of environmental conservation.

- Provide proper sanitation facility--bath rooms, toilet etc.
- Regular waste collection, pest control, training for good house-keeping practices.
- Full medical care for workers including annual or regular medical checkup.
- Manage to meet all statutory requirements (rules, regulation, Factories Act, Labour Act).
- Provide adequate PPE – e.g. suits, boots, helmet, face mask, gloves, ear muffs for workers expose to heat, dust, high noise level.

8) Potential social issue and mitigation measures to be taken

These are already mentioned in the Construction Phase. Such cases are unlikely to occur during the Operation Phase as all workers are handpicked by the executive members of the factory. Unlike the blue collar construction workers who are employed for short term (two years) the workers in the Operation Phase are permanent workers. It is expected that they are better well-disciplined than the construction workers.

Any way the authority of the factory has to deal with these workers on a long term basis. Measures for creating a peaceful and productive atmosphere shall be taken into account.

Mitigation measures to be taken

The project proponent will take the following measures:

Educate employees to be good workers who are dutiful, well-disciplined and diligent. Give them proper training on factory and work place regulation, and code of conducts. (This is a normal practice in all factories and work places.)

As for dealing with local community educate them regarding local cultural behavior and awareness to achieve responsible and healthy community interactions.

The company should deal with the employees on a fair and square basis. The company should be aware of widespread cases of workers unrest in Yangon as a result of overworked, underpaid, and unhealthy relation between the employees and the factory authority.

In addition to regular medical check-up, voluntary HIV testing on the workers is necessary as they are permanent workers of the factory. (HIV awareness campaign and voluntary HIV testing have yet to be implemented.) As regards public relation:

- Consider hiring locals in the future when project commence, especially unskilled jobs
- Try to reduce/eliminate the potential impact to quality of existing life style of the local community in the area. Avoid the impacts of project activities on their village, the infrastructure, land and farms, on drinking water sources, on the natural resources they are dependent upon, on their livelihood etc.

- Avoid the impact of project activities on the cultural component such as Buddhist Monastery, Pagoda, and historical monument, if any.
- Implement CSR programme for the community (certain CSR actions had been already taken by the Company)
- Maintain cordial relation with the local community
- Listen to the views, thoughts and opinion of the local people, heed to their concerns

9) Impact: potential security issue and mitigation measures to be taken

This is already mentioned in the Construction Phase when about many workers were employed. Unlike the hectic nature of work during the Construction Phase the working atmosphere during the Operation Phase is stable, with trained workers.

However security situation tends to slacken when a factory is running for several years. So for the long term Operation Phase the plan for security should be more practical. It is expected that the employee hand-picked by the factory authority will not pose any security threat to the factory. But outsiders, the local people, at one time or another can cause security problems such as theft, vandalism etc.

In this era of terrorism sabotage by terrorists cannot be ruled out. Also sabotage by destructive elements with anti-big business, anti-corporate and anti-cronyism mind set cannot be ruled out.

Mitigation measures to be taken

The project proponent will take the following measures:

Security will be planned for the long term. The wall of the factory compound will be good and reliable enough to keep the intruders at bay. Educate security personnel of the factory to be attentive and dutiful. Always restrict the access to the factory; if necessary set up watch towers.

All workers, both white and blue collar, will wear factory uniform and keep ID card for easy identification.

Security will be tight throughout the entire Operation Phase.

- Regularly check the fence and wall of the factory compound to ensure adequate security
- No unauthorized person on site
- Security guards at entrances; and patrol inside at night
- Keep things under lock and key as far as possible; take regular locks inspection
- Also post security guards or watch men at the site

10) Potential visual impact

The factory will be in the valley between two hills and may not be easily seen from a far. But the factory will stand out in contrast with its surrounding of scrub land. This will not be in harmony with the surrounding (sight pollution).

The bright light at night will be offensive to the eyes of the nearby locals and also wildlife, if any. It will also attract and kill insects at night.

The colour of the buildings and structures may not be pleasing to the eyes if extremely bright colour paints are used. The glaring reflection from the roofings will be also serious sight pollution.

Mitigation measures to be taken

- The company will keep in mind for visual appeal of the buildings and structures.
- Eye pleasing paints will be selected (bright red and yellow colour will not be selected).
- Blue or green roofings will be selected.
- Will use only yellow dim light instead of white bright light.
- Plant fast growing trees around the factory; create green zone.

Positive (beneficial) impact during the Operation Phase

There are many positive or beneficial impacts during the Operation Phase and they are long term in duration.

The main positive impacts in brief are:

The project will contribute to the creation of permanent jobs as well as part time jobs; fostering the economy of the local area, local region and also the nation; upgrading of physical infrastructure such as roads; decrease public health risk and in one way or another raising the living standard of many locals; and finally contribution to the improvement of the construction sector and hence, infrastructure of the country.

The first positive impact that can be easily seen is the creation of jobs. 450 workers (for 2 lines) will be employed permanently (during the Operation Phase); there are also a few dozens of daily wagers. There can still be employment opportunities for vacant posts from time to time. The door is still open for this.

The benefit goes beyond the region. Companies or enterprises that produce raw material such as coal and gypsum will have now the chance to do or expand the business and thus indirectly providing more jobs. Business men involve in wholesale distribution or retail sales can boost their business and thereby in one way or another indirectly create job opportunities.

In the local perspective the infrastructure development expected.

So far the company donated Ks 70,100,000 for infrastructure development.

On national level the benefits will accrue to the country in the form of direct investment of USD 256.1072 million and in the form of an increase in the Gross Domestic Product (GDP) of the country.

The country will benefit from increased investment, increased employment, increased earning, increased duties, taxes and revenues etc.

Young Investment Group Industry Co., Ltd should mitigate or minimize all negative impacts it will, on the other hand, maximize the positives impacts to their optimum.

6.2.1.4 During the Decommissioning/Mine closure Phase

Because this will happen 25 plus years from now this will be only summarized. Several decades ago this phase was also known as Abandonment Phase because at the end of the Operation Phase the project component simply walked away and left the site. But in this era of environmental awareness systematic decommissioning and rehabilitation has to be done.

Impacts/potential impacts that happened during construction and Operation Phase are not envisaged as the nature of works is different; only short decommissioning work and long rehabilitation (reforestation) work. All activities during Construction, Operation Phase are ceased at the end of operato phase.. Only the potential impacts anticipated are briefly mentioned.

1) Occupational Health and Safety and mitigation measures to be taken

Dismantling and demolition works are actually construction works in reverse. By the time the decommissioning has arrived the buildings and structures are already old. There can arise certain accidents in the work place if dismantling, demolishing and clearing works are not well-managed.

The probability for accidents is higher when dismantling/demolishing an old building than when building a new one.

The decommissioning works will result in generation of huge quantity of solid waste e.g. old building materials, concrete, bricks, woods, iron materials. There will be removed and the place tidied up.

Mitigation measures to be taken

The project proponent will take the following measures:

- Plan and manage for safe and effective decommissioning/mine closure.
- Hire a decommissioning contractor and party to do the decommissioning work at the factory site.. The contractor and party will removed all the solid wastes (old building materials of all sorts etc.) and discharge then at landfill.
- Ask the contractor to create a safety environment for all his workers – an accident free work place during the decommissioning period. Ask him also for tidying up the whole area of the factory compound. Restore the soil to original condition as far as possible.

- Revegetate the whole area.
- Dispose those that are no longer useable at an approved land fill.
- Machinery and equipment that are obsolete must be made into iron scrap and sent to smelting mill.
- Put up for sale or reuse certain equipment that are still usable.
- Also put up for sale old construction materials that are still saleable or usable. (Dispose those that are no longer usable at approved land fill.)

2) Potential residual impacts and mitigation measures to be taken

At the end of the long Operation Phase there can be residuals of fuel oil and/or chemical on the soil due to unnoticed accidental spills inside the factory compound during the long Operation Phase. Soil will be contaminated over a long period but may remain unnoticed.

No solid residual wastes will be left; all will be duly removed and disposed at the landfill. The place will be tidied up.

Decommissioning and rehabilitation works do not involve the use of heavy machinery and the burning of fuel oil and coal (as during the Operation Phase). It is expected that the impact on the air environment will be negligible.

Mitigation measures to be taken

The project proponent will take the following measures:

- Plan and manage for effective removal and clearing of all residuals.
- Test the soil for any contamination by fuel oils or hydrocarbons; hire technicians (no chemicals are used throughout the Operation Phase).
- Also test the water in the vicinity for pollutants; hire technicians.
- Remove soils contaminated by fuel oils and chemical-; dispose at an approved land fill.
- Ensure that all contaminates are removed; conduct final chemical testing.
- Also remove all other residuals, if any, resulting from 2 plus decades of activities.
- After removal of residual or contaminants test the air, water and soil for the last time to ensure that none are contaminated; no trace of pollution left.
- Restore the soil to its natural condition as far as possible and commence rehabilitation task; continue the work until a green zone is created (or) put up the plot for sale (or) redeploy the plot for any business.
- Ensure that after Decommissioning Phase future public health and safety are not compromised.

- Adverse socio-economic impacts after Decommissioning are minimized and socio-economic benefits are maximized.
- The after-use, if any, of the old site is beneficial and sustainable for the long run.

Note: The Decommissioning/Rehabilitation Phase will be at most 2 years. The tearing down and demolishing of old buildings and structure will take at most 1-2 months while most of the time will be for rehabilitation.

General potential impacts like during the Construction Phase such as; impact on air quality, noise and vibration, impact of mobilization, impact on traffic, impact on soil, water, etc., if any, may be negligible (only a decommissioning contractor and his few workers will be involved in decommissioning/rehabilitation works. The company and all its staffs will abandon the site after Operation Phase).

Therefore, noise and vibration impact and subsequent mitigation measures are omitted. In the same way most potential impact and mitigation are not mentioned.

6.2.2 Identification and assessment of the likelihood and severity of natural and industrial hazards relevant to the project

Natural Hazards

There were/are no precedents of severe natural hazards or disasters such as earthquake, violent storm, severe flood, extreme weather condition, draught, wildfires etc, in this area within memories of 50 years (according to local elders).

The area is well-sheltered and far away from the coast. The area is a flat terrain but is not a low land plain (elevation 200 m asl) and there are no great rivers or riverine system (only Myitnge River) and no low wetland to be flooded during the rainy season. The area does not have heavy rainfall but rather have a relatively dry zone climate. There were also no precedents of draught and wildfire.

The major fault line (Sagaing Fault Line is in the west; Shan Scrap Fault Line and Kyauk Kyan Fault Line are in the east. But are now not active fault lines (seismically quiet).

Industrial Hazards

However there can be industrial hazards resulting from the activities of the project.

The first industrial hazard is in the form of destruction and loss of habitats due to the implementation of the project. The clearing of forest for the Construction of access road, the Construction of the factory and later for quarry site preparations pose a severe industrial hazards on the biological components of the area, but not on human.

It is the industrial hazards resulting from activities at site and at the cement factory that can be termed true hazards for human being.

The most serious industrial hazards, if this can be called a hazard, is the pollution of the air environment due to the operation of cement factory. When it comes to polluting the atmosphere with carbon emission, cement factories stand second only to coal-fired thermal plants, it is learnt. It is internationally agreed that cement factories contribute to global warming and hence climate change due to emission of greenhouse gases (GHG) that include SO₂, NO_x, CO₂, CO, Hydrocarbon etc. This GHG is considered a serious industrial hazard for mankind.

Carbon emission from a cement factory is huge. It is estimated that for every ton of Portland cement produced 0.7 by 0.9 tons of CO₂ is generated. Multiply this 0.7 by 5000 tons to be produced at the factory and result is a staggering 3500 tons of CO₂ generates each day. (However when compare with the four top global air polluters, namely China, USA, India and Russia, the quantity of CO₂ emission at this plant will be just like the smoke from the burning of a joss stick!). But the company will not be complement with this fact. It will do its utmost to reduce carbon emission as practical as possible. After all the reduction of carbon emission is the duty of everyone for the long term survival of mankind.

The company will apply 58 bags filter to mitigate this impact especially PM. (This and other measures are already described earlier.)

The factory is a modern factory and modern factories are very different from factory of yesteryears which used to spew out billows and billows of dark smoke into the atmosphere; thank to the environmental awareness prevailing in the world today. However even the state of art cement factories cannot yet totally erase carbon emission. The atmosphere is still polluted by carbon emission from cement factories, and this is still inevitable. This can be simply rationalized as a small sacrifice of the air environment for the sake of national environmental development; cement is an essential materials for the construction sector and hence the infrastructure development of the nation.

The most significant industrial hazards, this can be called real industrial hazard, is cement/clinker dust. Physical hazards due to cement/clinker dust are in the forms of:

- Inhalation of the dust that can cause serious health problems (respiratory tract, lung)
- Dermal contact with dust which can cause irritation of skin and eyes.

Cement/clinker dust poses the most serious industrial hazards to workers at a cement factory.

- Occasional exposure to extreme heat (1400°C) at the Kiln is also a significant industrial hazard for workers. (The Kiln is remotely controlled and regulated but short duration occasional exposure is inevitable.)
- Probable fire and explosion is also a serious hazard though never heard of in Myanmar, where all private cement factories are new ones.

Other industrial hazards, which can be insignificant or significant, inside a cement factory are:

- Accidents and injuries due to trips, slips and falls
- Accidents and injuries due to hit by machinery and vehicles. (moving, rotating, reciprocating)
- Over exertions, working in awkward position for long hours – etc.

No industrial hazard, in the form of chemical hazards, is anticipated as no chemicals are used in the production of cement. (Of course there are very small quantities of chemicals used in the quality control laboratory.)

No industrial hazard, in the form of biological hazards, is anticipated as no organisms/microorganisms are involved. (The company has not yet applied the biological treatment of wastewater such as bacteria, blue green algae, and micro algae.)

6.2.3 The design, layout, functioning, management and implementation of appropriate impact and risk mitigation measures

Identification and assessment of each and every impact/potential impact during the Preconstruction, Construction, Operation and Decommissioning/Rehabilitation Phases and the subsequent mitigation measures to be taken for each and every impact/potential impact are already described earlier in technical details in subsection 6.2.1.

(It is not practical or convenient to describe the identification and assessment of impact in one separate sub-section and to describe mitigation measures to be taken in another separate sub-section. Therefore, impact identification and assessment for each impact and subsequent mitigation measures to be taken for each impact are described together in the same sub-section, 6.2.1). It is also not pragmatic to describe the design, layout, functioning, management and implementation of impact for each and every impact/potential impact. It is too academic and it is the works of academicians or researchers, and is beyond the scope of this EIA report. The management and implementation of mitigation measures are referred, copied or modified from various references and based on the on ground situation of the project).

6.2.4 Characterization and assessment of any residual impacts and risks

During the Construction Phase

During the Construction Phase large quantity of construction tailings and debris will be generated but there will be no issue of residual impact as all the debris will be removed and cleared after completion of construction.

There can be certain spills of chemical product, such as emulsion paint, varnished, sprays, epoxy resin, adhesives etc. during the finishing works of construction. Such spill will be cleared after each working session; there will be no residual impact.

(There will be no residues left after Construction Phase.)

During the Operation Phase

The factory will generate relatively small quantity of waste (dust, ash) and liquid waste. There can be residual impact on the surrounding if these industrial wastes are not well-managed.

There can be certain small oil spills at the car park, at pump house, compressor house, engine house etc but these will be remediated immediately (the use of absorbent rather than washing down with water to prevent the small spills percolating into underground water). Accidental oil spills on the whole will be minor ones.

Mild chemicals such as chlorine and derivatives can be used from time to time as disinfectant and also for the possible treatment of water. There can be no residual impact of chlorine as the water will be finally discharged or drained. The technology for chlorine treatment is the same classical treatment practiced worldwide and is of little environmental concern.

It is probable that pesticides, herbicides, insecticides and rodenticides may be used from time to time but always, in very small quantity. This can be easily mitigated. There can be no residual impact of these chemicals, as only small quantity will be used and only for very short periods, only on rare occasions in the quality control laboratory.

During the Decommissioning /mine closure phase

After the long Operation Phase the decommissioning process will have to be effectively implemented. Everything that remained of the cement factory site will have to be cleared; the soil if contaminated by fuel oil and chemicals will be removed and disposed at an approved landfill or dumping site. Materials that are still usable will be reused will be put up for sale.

Restoration of the forest and ecology will be carried out. Pits and dents will be backfilled and the ground levelled. Replantation of trees will be carried out; effective rehabilitation of the area will be undertaken. Therefore no residual impacts are anticipated after the completion of the project.

The company believes that there is no residual impact (s) to remain during or after the project. The company also believes that all the mitigation measures prescribed earlier can mitigate or remediate all the negative impacts mentioned earlier.

Therefore, no substantial residual impacts are anticipated during the whole life of the project, from the Preconstruction Phase to the Decommissioning Phase.

However, in case there is any residual left manual removal of residuals and contaminated soil will be undertaken. The soil will be removed and disposed of at an approved landfill. After that the soil will be tested for the last time to ensure that there is no residual left. The general guidelines for the removal of residuals and the hence the guidelines for decommissioning are:

Towards sustainable decommissioning [sitercourse.worldbank.org>resources](http://sitercourse.worldbank.org/resources)

Decommissioning process guide <http://its.edu/.../archive>

Decommission phase procedures HUD <http://www.hud.gov>

6.2.5 Risk assessment

Risk assessment is a process that involves measurements of risk to determine, prioritize and to enable identification of appropriate level of risk treatment. Risk is a function of likelihood and consequence.

Risk score = Likelihood x Consequence (or)

Risk score = (Probability x Exposure) x Consequence (or)

Risk Score (outcome) = Probability x Consequence

Pundits from different nations have formulated a great variety of risk ranking criteria based from different occupational aspects.

The objectives of risk assessments are:

- To prevent injuries and illness
- To remove a hazard or reduce the level of its risk
- To create a safer and healthier workplace

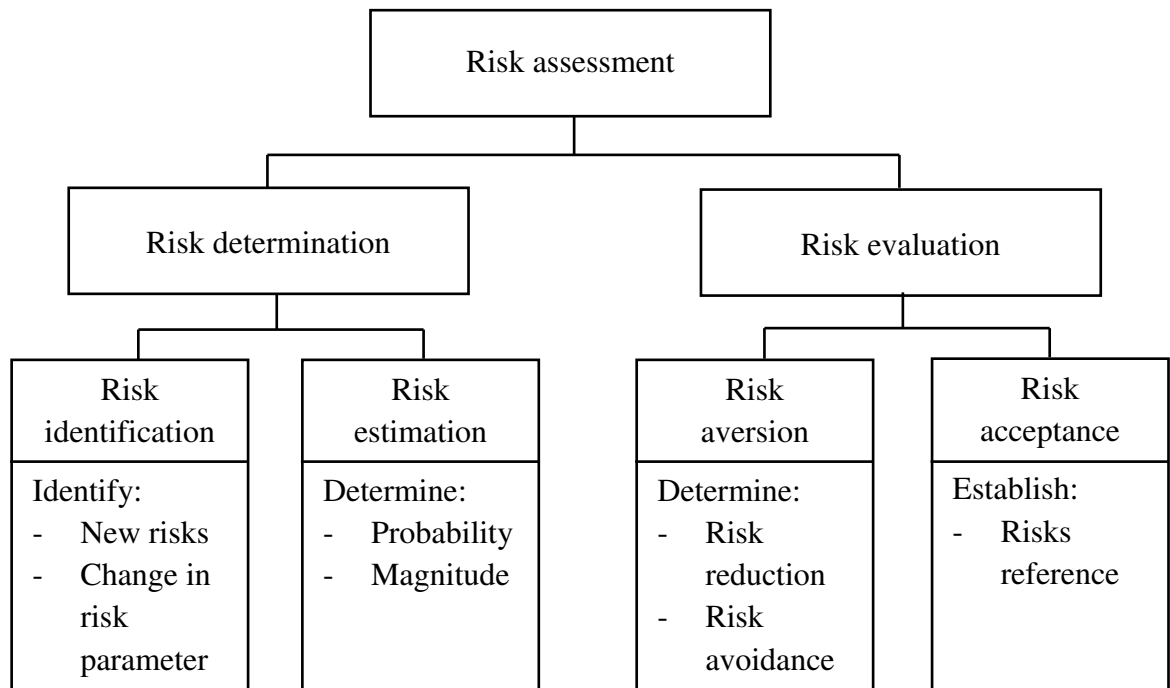
Risk assessments and management in brief

- Fully scope the risk assessment.
- Identify all hazards (potential hazards) and threats.
- Describe who might be harm.
- Evaluate the risks (high, medium, low, how bad, how often)
- Document and record the findings.

- Exchange information with others.
- Prepare for follow-up after risk assessment.
- Apply integrated risk mitigations.
- Regularly check the effectiveness of the risk assessment, management and mitigation programme.
- Review the risks assessment and management.

Although there are differences in the ways in which risk assessment is accomplished in different countries they usually contain three steps: risk identification, risk estimation and risk evaluation.

This can be simplified in diagram as from Rowe, 1980.



While "Hazard" is a source of potential harm or injury or loss "Risk" is the probability of occurrence of hazard.

Risk assessment is the work of expertise mathematicians, statisticians, computer programmers and specialists, medical scientist, engineers etc and the works involves the application of models, mathematical models, computer models, complex equations and formulae etc. In other word it is purely academic in nature or pure research in nature and beyond the scope of this EIA study which emphasizes on environmental aspects.

For pragmatic purpose of risk assessment certain governmental departments or agencies in other countries have provided guideline for risk assessment for different occupations for

example. For example, the Ministry of Environment and Forest of the government of India has prescribed guidelines for risk assessment for mining and quarries etc.

One very reliable way of risk assessment is to collect all data or records on accidents or mishaps that have occurred previously at various cements plants throughout the nation. Then analysis on these data is made and subsequent risk assessment is conducted (not applicable in Myanmar yet).

Another point to be born in mind is that risk assessment can be done only from negative or pessimistic perspectives. It is not practical to make risk assessment from positive or optimistic point of view. (No risk can be anticipated from optimistic point of view.)

The end point in risk assessment, therefore are very often simply worst case scenario. But in the real world worst case scenario very rarely happen.

No developmental project is devoid of risk; the risk may be low or medium or high.

The company will look into the nature of all those impacts and assess the risks and follow the preventive, corrective and mitigation measures prescribed in this EIA report.

Pragmatic Risk Assessment

Risk is the likelihood of a negative outcome – e.g. danger. In other word it is the potential negative impact of an event determined by combining the likelihood the event occurring with the impact should it occur. In many EIA reports abroad the word "risk" and "impact" are used interchangeably.

The well-established equation for risk assessment is –

- "Consequence multiply by likelihood equals outcome"; (Consequence x Likelihood = Outcome).
- The rating for consequence ranges from 1 to 5, (1 = insignificant; 2 = minor; 3 = moderate; 4 = major; 5 = extreme/catastrophic).
- The rating for likelihood ranges from 1 to 5 (1 = very improbable; 2 = improbable; 3 = probable; 4 = highly probable; 5 = definite/almost certain).
- The rating for outcome ranges from 1 to 25; very low; low; medium; high; very high.

The pragmatic method, known as Expert judgement method or Experts consensus method or Experts opinion method or Ad hoc method is widely applied. In this report risk and impact assessments are based from the above mentioned equation and Expert consensus method.

Overall risks and impacts qualitative assessment during the construction, Operation Phase and Decommissioning Phase are given below (Preconstruction Phase is omitted but impact and mitigations are described earlier in 6.2.1.1).

Risk rating matrix

Actual risk outcome					
Low (1-3)	Moderate (4-6)		High (8-12)	Extreme (15-25)	
Consequence	Likelihood				
	Rare 1	Unlikely 2	Possible (moderate) 3	Likely 4	Almost certain 5
Catastrophic (Extreme) 5	5	10	15	20	25
Major (High) 4	4	8	12	16	20
Moderate (Medium) 3	3	6	9	12	15
Minor (Low) 2	2	4	6	8	10
Negligible 1	1	2	3	4	5

- Red: avoid, control, mitigate;
- Yellow and orange: control, mitigate;
- Green: accept/assume

Actual risk outcomes are categorized into 4 levels:

- Low - (Scoring 1-3)
- Moderate - (Scoring 4-6)
- High - (Scoring 8-12)
- Extreme - (Scoring 15-25)

Note: - Consequence x Likelihood = actual outcome

Note: - This simple, pragmatic and straight forward matrix method is selected for assessment of impact and risk. Moderation is undertaken applying Experts Consequences Method (Ad hoc method). (From Internet).

Table – 19: During the Construction Phase

Sr. No	Impact	Likelihood	Consequence	Outcome	Mitigation/mitigable	Expected outcome after mitigation
1	Impact on air environment	5	2	10 high	mitigable	low
2	Noise and vibration	5	2	10 high	mitigable	low
3	Impact on land environment	5	2	10 high	mitigable	low
4	Impact on water environment	2	1	2 low	mitigable	low
5	Impact on waste (waste disposal)	5	3	15 extreme	mitigable	low
6	Biodiversity	5	2	10 high	mitigable	low
7	Occupational health and safety issue	1	2	2 low	mitigable	low
8	Potential social issue	1	2	2 low	mitigable	low
9	Potential security issue	2	3	6 moderate	mitigable	low

Table – 20: During the Operation Phase

Sr. No	Impact	Likelihood	Consequence	Outcome	Mitigation/mitigable	Expected outcome after mitigation
1	Impact on air environment	5	3	15 extreme	mitigable	low
2	Noise and vibration	5	2	10 high	mitigable	low
3	Impact on land environment	3	2	6 moderate	mitigable	low
4	Impact on water environment	3	1	3 low	mitigable	low
5	Impact of wastes	4	2	8 high	mitigable	low
6	Potential impact on traffic	3	1	3 low	mitigable	low
7	Occupational health and safety issue	1	3	3 low	mitigable	low
8	Potential social issue	1	1	1 low	mitigable	low
9	Potential security issue	1	2	2 low	mitigable	low
10	Potential visual impact	3	2	6 moderate	mitigable	low

During the Decommissioning Phase

Sr. No	Impact	Likelihood	Consequence	Outcome	Mitigation/mitigable	Expected outcome after mitigation
1	Potential occupational health and safety issue	1	3	3 low	mitigable	low
2	Potential residual impacts	2	2	4 moderate	mitigable	low

Note – The impacts will be short-lived (during short Decommissioning Phase). All are easily mitigable.

6.2.6 Comprehensive monitoring plan

Monitoring is essential for effective implementation of a project.

Monitoring plans for Construction, Operation and Decommissioning Phases are shown in tabulated forms.

Table – 21: Overall monitoring plan during the Construction Phase

Sr. No	Components	Parameters to be monitored		Frequency	Responsible persons
1.	Weather	- monitor weather - listen to weather news (meteorology news), forecasts	- at the factory compound	- Daily - Daily	- EMP cell members - EMP cell members
2.	Mobilization and preparation works	- monitor the haulage of trucks - monitor stockpiling, storage of building materials	- at the compound and on access road	- Daily - Weekly	- EMP cell members - EMP cell members
3.	Traffic	- monitor schedule of vehicle movements	- at access road	- Weekly	- EMP cell members
4.	Air environment	- monitor SO ₂ , NO ₂ , PM and others, if possible (Re: ECD's NEQ guideline)	- inside the compound	- Once	- EMP cell members
5.	Noise and vibration	- monitor noise level in dBA (Re: ECD's NEQ guideline)	- inside the compound	- Once	- EMP cell members
6.	Contamination of soil and ground water	- monitor spillage of fuel oil, grease, hydraulic oils etc	- inside the compound	- Weekly	- EMP cell members
7.	Erosion and siltation	- monitor earth work and drainage system	- inside the compound	- Weekly (during rainy season)	- EMP cell members
8.	Water environment	- Total coliforms, Fecal coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron, P ^H , Sulphate, Total Dissolved Solids	- at Myitnge River	- Once	- EMP cell members

9.	Waste (solid), construction tailings, debris	- monitor type, amount generated, reused, recycled, transported off site and disposal	- at compound	- Weekly	- EMP cell members
10.	Biodiversity component	- monitor clearing of forest - monitor the nursery of saplings for planting during Operation Phase	- around the compound;	- Monthly - Monthly	- EMP cell members - EMP cell members
11.	Social illness; disciplinary action	- monitor the conducts of workers - monitor the effectiveness of disciplinary action	- at the site, living quarter nearby villages	- Weekly or monthly - From time to time	- EMP cell members - EMP cell members
12.	Occupational health and safety and emergency plan	- monitor facilities for emergency preparedness - monitor emergency and response programme - monitor training (firefighting and first aid) and drills and their effectiveness	- at factory compound; at work places	- Quarterly - From time to time - Regularly	- EMP cell members - EMP cell members
13.	Potential security	- monitor performance of security staffs	- at the compound	- From time to time	- EMP cell members
14.	Construction work	- monitor overall construction work for health and safety	- at the site	- Daily	- EMP cell members
15.	Material procurement and consumption	- monitor procurement of building materials, and consumption	- at temporary store, warehouse logbook	- Weekly or monthly	- EMP cell members
16.	Fuel oil consumption	- monitor oil purchased, used, used oil generated, oil waste	- at fuel depot, logbook	- Weekly or monthly	- EMP cell members
17.	Routine operation of equipment	- monitor operation hours of equipment - distance traveled of vehicles - log books	- log books for machinery and vehicle	- Weekly - Weekly - Weekly	- EMP cell members

Table – 22: Overall monitoring plan during the Operation Phase

Sr. No	Components	Parameters to be monitored	Place/spot for monitoring	Frequency	Responsible persons
1.	Weather	<ul style="list-style-type: none"> - monitor weather - listen to weather news, forecasts 	<ul style="list-style-type: none"> - At the factory - At the factory 	<ul style="list-style-type: none"> - Daily - Daily 	<ul style="list-style-type: none"> - EMP cell members - EMP cell members
2.	Limestone/clay, laterite, processing, crushing, grinding, screening, transport, stockpiles	<ul style="list-style-type: none"> - monitor crusher, grinder, screen performance - stockpile of pulverized limestone (quantity) - conveyor 	<ul style="list-style-type: none"> - At the crusher - At the shed - At the conveyor 	<ul style="list-style-type: none"> - From time to time - From time to time - From time to time 	<ul style="list-style-type: none"> - EMP cell members - EMP cell members - EMP cell members
3.	Erosion and siltation	<ul style="list-style-type: none"> - monitor natural drainage system 	<ul style="list-style-type: none"> - At the factory 	<ul style="list-style-type: none"> - Weekly (rainy season) 	<ul style="list-style-type: none"> - EMP cell members
4.	Activities inside factory	<p>Monitor:</p> <ul style="list-style-type: none"> - milling; preheating and clinkerization, clinker cooling and storage; grinding, gypsum addition, packing and storage 	<ul style="list-style-type: none"> - Inside the factory at respective spots 	<ul style="list-style-type: none"> - Daily 	<ul style="list-style-type: none"> - EMP cell members
5.	Routine operation of equipment	<ul style="list-style-type: none"> - monitor operation hours of equipment and machines - monitor distance travelled of vehicles (monitor log books) 	<ul style="list-style-type: none"> - (at factory) - (at factory) 	<ul style="list-style-type: none"> - Weekly - Weekly 	<ul style="list-style-type: none"> - EMP cell members - - EMP cell members
6.	Air quality	<ul style="list-style-type: none"> - monitor SO₂, NO₂, PM CO, O₃, VOC, if possible (Re: ECD's NEQ guideline) 	<ul style="list-style-type: none"> - At the factory and nearby villages 	<ul style="list-style-type: none"> - Annually or as required 	<ul style="list-style-type: none"> - Hired technicians
7.	Air emission	<ul style="list-style-type: none"> - monitor SO₂, NO₂, PM, CO, SPM, PM₁₀, PM_{2.5}, HC, if possible mercury, temperature, velocity, total metals 	<ul style="list-style-type: none"> - At the factory and nearby villages 	<ul style="list-style-type: none"> - Annually or as required 	<ul style="list-style-type: none"> - Hired technicians

		- monitor the wearing of PPE (Re: ECD's NEQ guideline)	- At the factory and nearby villages	- Annually or as required	- Hired technicians
8.	Noise and vibration	- monitor noise level in dBA - wearing of PPE at site (Re: ECD's NEQ guideline)	- At the factory and nearby villages - At the factory	- Quarterly - From time to time	- EMP cell members - EMP cell members
9.	Water quality	- Total coliforms, Fecal coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron, P ^H , Sulphate, Total Dissolved Solids	- At the factory and near by villages - At the river	- Semi-annually - Semi-annually	- Hired technicians - Hired technicians
10.	Solid waste	- monitor industrial, domestic, office wastes, debris; amount generated, recycled, or reused; check work place	- At the factory	- Monthly	- EMP cell members
11.	Waste water	- monitor amount generated, treatment (septic tank, common treatment tank) (Re: ECD's NEQ guideline)	- At the factory	- Monthly	- EMP cell members
12.	Traffic	- monitor schedule of vehicle movement, log book for each vehicle	- On the access road & main road	- Weekly	- EMP cell members
13.	Effluent	- test pH, temperature increase, total suspended solid (Re: ECD's NEQ guideline)	- At the river	- Annually	- Hired technicians

14.	Materials procurement	<ul style="list-style-type: none"> - monitor all materials of coal and gypsum - monitor all materials purchased and consumed 	<ul style="list-style-type: none"> - At the warehouse and shed - At the warehouse and shed 	<ul style="list-style-type: none"> - Monthly - Monthly 	<ul style="list-style-type: none"> - EMP cell members - EMP cell members
15.	Fuel oil consumption	<ul style="list-style-type: none"> - monitor oil purchased, used, used oil generated, oil waste 	<ul style="list-style-type: none"> - At the fuel depot and log book 	<ul style="list-style-type: none"> - Monthly 	<ul style="list-style-type: none"> - EMP cell members
16.	Social illness	<ul style="list-style-type: none"> - check disciplinary action taken - monitor conducts of workers 	<ul style="list-style-type: none"> - At the factory and living quarters - At the factory and living quarters 	<ul style="list-style-type: none"> - From time to time - Regularly 	<ul style="list-style-type: none"> - EMP cell members - EMP cell members
17.	Occupational health and safety and emergency	<ul style="list-style-type: none"> - inspect facilities for emergency preparedness - monitor training (firefighting and first aid) and drill for emergency - monitor overall occupational health and safety including occupational accident and diseases 	<ul style="list-style-type: none"> - At the factory and registered book - At the factory and registered book - At the factory and registered book 	<ul style="list-style-type: none"> - Quarterly - Regularly - From time to time 	<ul style="list-style-type: none"> - EMP cell members - EMP cell members - EMP cell members
18.	Security (for factory land)	<ul style="list-style-type: none"> - monitor performance of security staffs 	<ul style="list-style-type: none"> - At factory 	<ul style="list-style-type: none"> - Weekly 	<ul style="list-style-type: none"> - EMP cell members
19.	Capacity building	<ul style="list-style-type: none"> - monitor effectiveness of capacity building programme and other training including first aid 	<ul style="list-style-type: none"> - At factory 	<ul style="list-style-type: none"> - From time to time 	<ul style="list-style-type: none"> - EMP cell members

20.	Compliance with regulation, a legal requirement	- monitor all main activities to ensure compliance with legal requirement and corporate commitment	- At factory	- Monthly	- EMP cell members
21.	Effectiveness of mitigation measures	- monitor mitigation measures taken and check their effectiveness	- At factory	- From time to time	- EMP cell members

Table – 23: Overall monitoring plan during the Decommissioning Phase

Sr. No	Component to be monitored	Parameters to be monitored		Frequency	Responsible persons
1.	Decommissioning works	- monitor the decommissioning works; dismantling, demolishing works,	- at the compound, - at mining sites	- Daily or weekly	- Hired contractor & EMP cell members
2.	Decommissioning works and closure work	- monitor the clearing and tidying work, leveling of ground, restoration of soil	- at the compound,	- Weekly	- Hired contractor & EMP cell members
3.	Decommissioning work	- monitor the removal of contaminated soil, if any	- at the compound,	- Once	- Hired contractor & EMP cell members
4.	Testing of soils and air,	- monitor the testing of soil and air	- at factory and nearby villages	- For the last time	- Hired Technician
5.	Testing of water quality	- monitor the testing of water at nearby water	- at Myitnge River and nearby villages	- From time to time	- Hired technicians
6.	Rehabilitation work	- monitor the rehabilitation works; planting of trees; restoration of ecology	- factory compound	- Weekly & monthly	- EMP cell members

Monitoring Plan

The specific monitoring plan (semi-annual monitoring plan) is shown in tabulated form below:

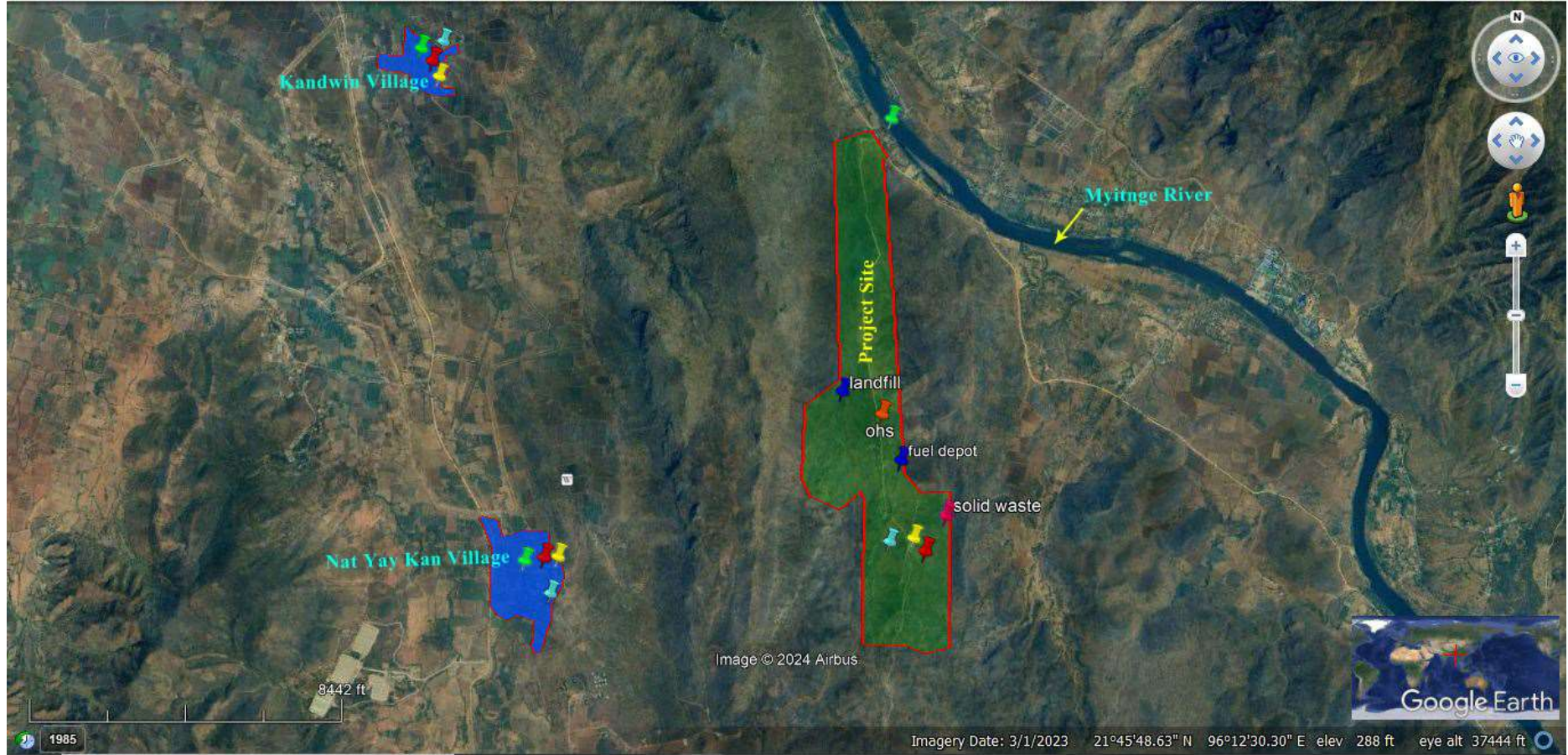
Table – 24: Summary of monitoring plan during the Construction Phase

Sr No.	Component	Parameter to be monitored	Monitoring point	Frequency	Responsible person	Cost (once off)
1	Air quality	- NO ₂ , SO ₂ , PM ₁₀ , PM _{2.5} , O ₃ , CO, VOC etc	- at factory compound Coordinate: N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0"	once during Construction Phase	Hired technicians	Ks 1,700,000
			- at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5"	once during Construction Phase	Hired technicians	Ks 1,700,000
			- at Kandwin village Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"	once during Construction Phase	Hired technicians	Ks 1,700,000
2	Water quality	- Total coliforms, Fecal coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron, P ^H , Sulphate, Total Dissolved Solids	- at Myitnge river Coordinate: N. Lat. 21° 46' 38.3"; E. Long. 96° 16' 30.3"	once during Construction Phase	Hired technicians	Ks 200,000
			- at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 35.9"; E. Long. 96° 14' 52.0"	once during Construction Phase	Hired technicians	Ks 200,000

			- at Kandwin village Coordinate: N. Lat. 21° 46' 53.1"; E. Long. 96° 14' 15.0"	once during Construction Phase	Hired technicians	Ks 200,000
3	Noise and vibration	<u>Noise</u> - dBA day time and night time	- at factory compound Coordinate: .Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0"	once during Construction Phase	Hired technicians	Ks 200,000
			- at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5	once during Construction Phase	Hired technicians	Ks 200,000
			- at Kandwin village Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"	once during Construction Phase	Hired technicians	Ks 200,000
			- at factory site Coordinate: N. Lat. 21° 44' 46.2"; E. Long. 96° 16' 39.0"	once during Construction Phase	Hired technicians	Ks 100,000
			- at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 33.9"; E. Long. 96° 15' 01.7"	once during Construction Phase	Hired technicians	Ks 100,000
		<u>Vibration</u> - to monitor vibration level				

			- at Kandwin village Coordinate: N. Lat. 21° 46' 52.7"; E. Long. 96° 14' 14.7 "	once during Construction Phase	Hired technicians	Ks 100,000
4	Solid waste	- Regular visual inspection of construction wastes - Also monitor domestic waste; quantity generated per month, collection and disposal activities	- inside the compound Coordinate: N. Lat. 21°44'51.48"; E. Long. 96°16'49.02"	- Monthly	EMP cell members and 15 trained staff	Free of charges
5	Soil	- Monitor soil quality; texture, sand, silt, clay, pH, moisture, total N, P - Monitor earth works (construction work) - Monitor potential soil structure and soil profile damage, if any and make corrective measures	- inside factory compound Coordinate: N. Lat. 21° 44' 44.7"; E. Long. 96° 16' 40.1" - at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 33.3"; E. Long. 96° 15' 01.8" - at Kandwin village Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 14.1"	- once during Construction Phase - once during Construction Phase - once during Construction - Weekly - Monthly	Hired technicians Hired technicians Hired technicians EMP cell members and 15 trained staff	Ks 50,000 Ks 50,000 Ks 50,000 Free of charges

		<ul style="list-style-type: none"> - Inspect potential contamination of soil by fuel spill - Regularly inspect lavatories; take corrective measures where necessary - Monitor potential erosion (wet months) 		<ul style="list-style-type: none"> - Monthly - Monthly - Monthly 		
6	Hazardous materials and waste	<ul style="list-style-type: none"> - Monitor the storage, handling and uses of fuel oil - Monitor the collection of used fuel oil, engine oil in old drums and give away to local recycler - Monitor disposal of lamp, bulb, battery, filters 	<ul style="list-style-type: none"> - fuel depot Coordinate: N. Lat. 21°45'5.44"; E. Long. 96°16'35.61" - at landfill area Coordinate: N. Lat. 21°45'23.29"; E. Long. 96°16'18.18" 	<ul style="list-style-type: none"> - Monthly - Monthly 	<ul style="list-style-type: none"> EMP cell members and 15 trained staff EMP cell members and 15 trained staff 	<ul style="list-style-type: none"> Free of charges Free of charges
7	Occupational Health and Safety	<ul style="list-style-type: none"> - Regular inspection of working place (construction site) and working condition - Inspect the storage of first aid kits, medicine and drugs, take corrective measures, if necessary - Keep a record book for incidents injuries and sickness for the Construction Phase and regularly monitor the record book; take corrective measures, when necessary 	<ul style="list-style-type: none"> - inside the compound Coordinate: N. Lat. 21°45'17.60"; E. Long. 96°16'29.79" 	<ul style="list-style-type: none"> - Weekly - Monthly - Monthly 	<ul style="list-style-type: none"> EMP cell members and 15 trained staff 	<ul style="list-style-type: none"> Free of charges



LEGEND








- | | | | |
|--|---|--|--|
|  Monitoring points of air quality and noise level |  Monitoring points of vibration |  Monitoring points of soil quality |  Monitoring points of OHS |
|  Monitoring points of water quality |  Monitoring point of solid waste |  Monitoring points of hazardous waste | |

Figure: 56 – Satellite image showing monitoring points of Construction Phase

Table – 25: Summary of monitoring programme during Operation Phase

Sr No.	Component	Parameter to be monitored	Monitoring point	Frequency	Responsible person	Cost (once off)
1	Air quality emission	- NO ₂ , SO ₂ , PM ₁₀ , PM _{2.5} , O ₃ , CO, VOC etc	- at factory compound Coordinate: N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0"	semi-annually	Hired technicians	Ks 1,700,000
			- at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5"	semi-annually	Hired technicians	Ks 1,700,000
			- at Kandwin village Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"	semi-annually	Hired technicians	Ks 1,700,000
2	Water quality/effluent	<u>water quality</u> - Total coliforms, Fecal coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron, P ^H , Sulphate, Total Dissolved Solids	- at Myitnge river Coordinate: N. Lat. 21° 46' 38.3"; E. Long. 96° 16' 30.3"	semi-annually	Hired technicians	Ks 200,000
			- at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 35.9"; E. Long. 96° 14' 52.0"	semi-annually	Hired technicians	Ks 200,000

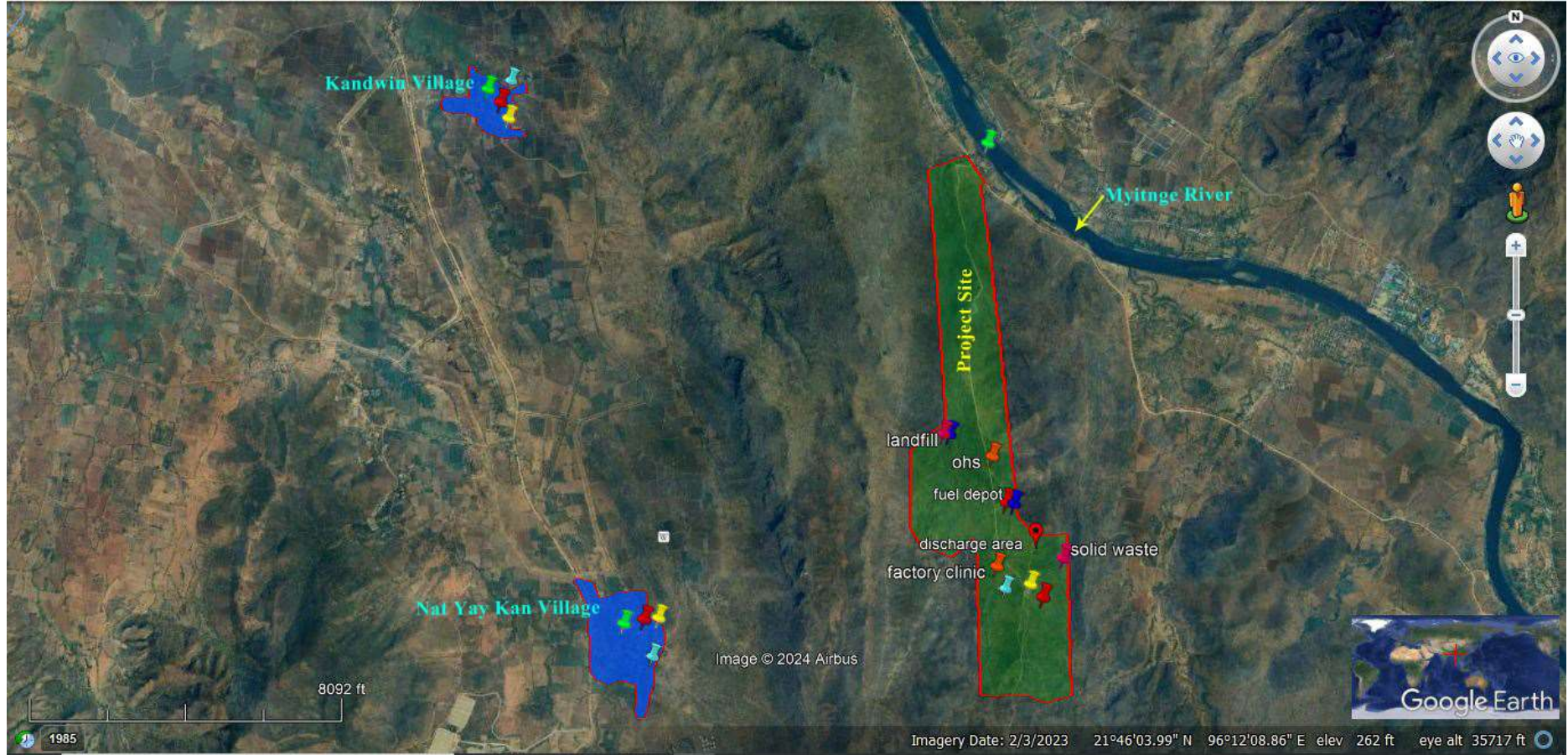
		<u>Effluent</u> - pH, temperature increase, total suspended solid	- at Kandwin village Coordinate: N. Lat. 21° 46' 53.1"; E. Long. 96° 14' 15.0" - at discharge area Coordinate: N. Lat. 21° 44' 56.73"; E. Long. 96° 16' 42.43"	semi-annually semi-annually	Hired technicians Hired technicians	Ks 200,000 Ks 50,000
3	Noise and vibration level	<u>Noise</u> - dBA during day time and night time <u>Vibration</u> - to monitor vibration level	- at factory compound Coordinate: N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0" - at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5" - at Kandwin village Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0" - at factory site Coordinate: N. Lat. 21° 44' 46.2"; E. Long. 96° 16' 39.0"	semi-annually semi-annually semi-annually semi-annually	Hired technicians Hired technicians Hired technicians Hired technicians	Ks 200,000 Ks 200,000 Ks 200,000 Ks 100,000

			<ul style="list-style-type: none"> - at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 33.9"; E. Long. 96° 15' 01.7" - at Kandwin village Coordinate: N. Lat. 21° 46' 52.7"; E. Long. 96° 14' 14.7 " 	<ul style="list-style-type: none"> semi-annually semi-annually 	<ul style="list-style-type: none"> Hired technicians Hired technicians 	<ul style="list-style-type: none"> Ks 100,000 Ks 100,000
4	Solid waste	<ul style="list-style-type: none"> - Regular visual inspection of solid wastes - Monitor record book or log book of solid wastes (industrial and domestic) generated per month; quantity, and mode of collection and disposal; make correction if necessary; 	<ul style="list-style-type: none"> - log books and at the company's land fill; Coordinate: N. Lat. 21°44'51.48"; E. Long. 96°16'49.02" 	<ul style="list-style-type: none"> - Weekly, Monthly 	<ul style="list-style-type: none"> EMP cell members and 15 trained staff 	<ul style="list-style-type: none"> Free of charges
5	Soil	<ul style="list-style-type: none"> - Monitor potential erosion (wet months) and potential contamination of soil by fuel spill; tackle the issue promptly - Regular inspection of warehouse area and oil depot area - Monitor soil quality; texture, sand, silt, clay, pH, moisture, total N, P 	<ul style="list-style-type: none"> - inside and around the compound - around warehouse and fuel depot Coordinate: N. Lat. 21°45'5.44"; E. Long. 96°16'35.61" - inside factory compound Coordinate: N. Lat. 21° 44' 44.7"; E. Long. 96° 16' 40.1" 	<ul style="list-style-type: none"> - Monthly - Monthly semi-annually 	<ul style="list-style-type: none"> EMP cell members and 15 trained staff Hired technicians Hired 	<ul style="list-style-type: none"> Free of charges Ks 50,000

			<ul style="list-style-type: none"> - at Nat Yay Kan village Coordinate: N. Lat. 21° 44' 33.3"; E. Long. 96° 15' 01.8" - at Kandwin village Coordinate: N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 14.1" 	<ul style="list-style-type: none"> semi-annually semi-annually 	<ul style="list-style-type: none"> technicians Hired technicians 	<ul style="list-style-type: none"> Ks 50,000 Ks 50,000
6	Hazardous materials and hazardous waste	<ul style="list-style-type: none"> - Monitor the storage, handling and uses of fuel oils, inspect fuel depot regularly - Monitor the collection of used fuel oil engine oil in old drums and give away to recyclers - Monitor the collection of used filter bags, lamp, bulbs, battery and their disposal at landfill 	<ul style="list-style-type: none"> - at fuel depot Coordinate: N. Lat. 21°45'5.44"; E. Long. 96°16'35.61" - waste bins and landfill Coordinate: N. Lat. 21°45'23.29"; E. Long. 96°16'18.18" 	<ul style="list-style-type: none"> Weekly/ Monthly Weekly/ Monthly 	<ul style="list-style-type: none"> EMP cell members and 15 trained staff EMP cell members and 15 trained staff 	<ul style="list-style-type: none"> Free of charges Free of charges
7	Occupational Health and Safety	<ul style="list-style-type: none"> - Regular inspection of work place and working condition; make correction where necessary - Inspection condition of factory's clinic; monitor the log books on accidents, injuries and sickness; member of patient treated at clinic, and those that are submitted to the nearest hospital - Inspect the medicine and drugs stock; refill where necessary 	<ul style="list-style-type: none"> - all working places Coordinate: N. Lat. 21°45'17.60"; E. Long. 96°16'29.79" - factory's clinic Coordinate: N. Lat.21°44'49.46"; E. Long. 96°16'30.95" 	<ul style="list-style-type: none"> - Monthly - Monthly 	<ul style="list-style-type: none"> EMP cell members and 20 trained staff EMP cell members and 20 trained staff 	<ul style="list-style-type: none"> - Free of charges - Free of charges

		<ul style="list-style-type: none"> - Monitor the first aid training and fire-fighting training - Monitor other training on educative session (lectures on OHS given by invited trainer/lecturer etc.). 	<ul style="list-style-type: none"> - factory compound during training session - Hall during educative lecture session 	<ul style="list-style-type: none"> - once during session - once during session 	<ul style="list-style-type: none"> Invited trainers Invited lecturer/trainer 	<ul style="list-style-type: none"> - Ks 2,000,000 Honourarian fees for two training programmes - Ks 300,000 (presents or courtesy gifts) for lecturer
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Note: The Monitoring Report will be duly submitted to the relevant environmental authority, ECD, on a semi-annual basic (every six months). At the moment Cadmium + Thallium, dioxide/furans dust, mercury and heavy metals of NEQEG code no. 2.3.6.1 cannot be measured by hired technicians and they are not familiar with these parameters and the units mg/Nm³. The company will do its best to solve this issue and report it in semi-annual report later.



LEGEND

- | | | | |
|--|---|--|---|
|  Monitoring points of air quality and noise level |  Monitoring points of vibration |  Monitoring points of soil quality |  Monitoring points of OHS |
|  Monitoring points of water quality |  Monitoring point of solid waste |  Monitoring points of hazardous waste |  Monitoring points of effluent |

Figure: 57 – Satellite image showing monitoring points of Operation Phase

Commitment

Young Investment Group Industry Co. Ltd has made a commitment to take all the mitigation measures mentioned in this chapter, whenever and whenever necessary.

Daw Hla Myat Thu

Director

Young Investment Group Industry Co. Ltd

7. CUMULATIVE IMPACTS ASSESSMENT

Definition

Cumulative environmental effects can be defined as effects on the environment which are caused by the combined result of past, current and future activities. Over time, direct or indirect human activities combine to collectively impact the environment.

Cumulative impacts are those that resulted from the successive, incremental and/or combined effect of an action, project or activity when added to other existing planned and/or reasonably anticipated future ones.

7.1 Methodology and approach

General process or steps for implementing CIA involve 5 steps:

- Step 1 - Scoping Phase
- Step 2 - Establish information or baseline status of VESC
- Step 3 - Assess CI on VESC
- Step 4 - Assess significance of predicted CI
- Step 5 - Management of CI; plan design and implementation

As regards the processes for CIA these could be put in this way:

CIA is:

- a) a process of analyzing the potential impacts and risks of proposed project in the context of potential effects of human activities and natural environmental and social external drivers on the chosen VESC over time
- b) a process of proposing concrete measures to avoid, reduce, or mitigate such CIs and risks to the extent possible

The approach is simple, pragmatic and straight forward.

The management for implementation of negative impacts during the Construction, Operation and Decommissioning/Mine closure Phases are actually integral parts of Cumulative Impacts Management (CIM). The logic is that if effective mitigation measures over the years, that is, during the Construction, Operation and Decommissioning/Mine closure Phases were implemented the cumulative impacts will be minimized or reduced.

Responsibility for CIM

The project proponent is responsible for the management of cumulative impacts due to the implementation of the project.

Shared responsibility for management of Cumulative Impacts (CI) is necessary when a series of projects are operating in an area.

7.2 Cumulative Impact Assessment

7.2.1 Identification and assessment of the potential cumulative impact on the component in the surrounding environment and the project contribution to such impact

Simultaneous cumulative impacts or combined cumulative impact from other sources

There are no other project in the area and, therefore, there will be no simultaneous cumulative impact or combined cumulative impact.

However, when the line 2 factory (capacity 10,000 tons/day) is in operation there will be simultaneous cumulative impact.

The project contribution to cumulative impact

The project contribution to the cumulative impact will be the loss of 513.36 acres of habitat due to the clearing of vegetation for the construction of factory complex and limestone quarry.

Another impact will be the loss of non-living natural resource of the area:

- 2,306,800 tons of limestone per year (4,613,600 tons for two lines)
- 259,900 tons of clay per year (519,900 tons for two lines)
- 100,000 tons of iron ore per year (200,000 tons for two lines)
- 92,800 tons of gypsum tons per year (185,600 tons for two lines)
- 218,000 tons of coal per year (185,600 tons for two lines)

(Multiply these figures by 30 years and the results are will be very huge indeed). (E.g. 69,204,000 tons of limestone for one line only).

7.2.2 Determination of the leverage and influence that the project may have over the significant and project related cumulative impact

In developed and industrialized countries the subjects of CIA and CIM have developed to an advanced phase. But actually these subjects are the works of scholars or pure academicians that involve the application of a variety of computer programmings, complex mathematical models, computer modelling or a mathematical formulae and statistics calculations and manipulations. These are outside the domain of ordinary people including the businessmen (the project proponent/and the EIA/IEE consultants).

In this Young Investment Group Industry Co., Ltd cement factory and limestone mining/quarry context a very simplified way of addressing CIA is mentioned.

(a) During the Construction Phase

Cumulative impacts can be detected even during the short and temporary Construction Phase.

The clearing of vegetation for the construction of access road and for the construction of factory in the early phase of construction happened more or less at the same time. This can be termed as simultaneous or combined cumulative impact on the habitat. Although relatively short in duration the impact is significant. However after completion of construction work there will be no more impact.

If the short duration of 2 years of Construction Phase is divided and subdivided into months, weeks and days then there are month after months, week after weeks and day after day impacts of construction work. These impacts can be termed cumulative impacts (incremental or successive cumulative impacts) during the relatively short Construction Phase.

Solid wastes of all kinds, especially construction tailings, debris, domestic wastes and trash from office, kitchen etc, if not managed and regularly disposed of will accumulate over the months (incremental cumulative impact).

Impacts during the Construction Phase are temporary (2 years) and can be mitigated effectively.

(b) During the Operation Phase

It is during this long Operation Phase that certain cumulative impacts are magnified and some are non-mitigable and irreversible.

(i) Carbon emission

The first and foremost cumulative impact is the emission of CO₂ into the atmosphere. Green House Effect that leads to global warming is the result of accumulation of CO₂ into the atmosphere from different sources all over the world.

As mentioned earlier the production of 1 ton of Portland cement generates 0.7 to 0.9 ton (dry and wet process) of CO₂ into the atmosphere. In this Young Investment Cement Plant context that means 5000 tons of cement multiplied by 0.7, and equivalent to 3500 tons of CO₂/day. Multiply this by 300 (300 working days/year) and then again by 30 years and the result will be staggering (31,500,000 tons CO₂). (The scenario if mitigation measures are not taken). Although cement factories applying modern technology have improved a lot in reducing carbon emission effective minimization of emission especially CO₂ has yet to be achieved.

CO₂ is the main gas that leads to greenhouse gas and global warming and eventually to climate change. NO_x, Ozone, methane and water vapour are also greenhouse gas.

(But when compared to the emission by four top global emitters, namely, China, USA, India and Russia as mentioned earlier the emission from this cement plant is negligible. The quantity emitted will be just like the small quantity of smoke emitted from the burning a joss stick!) However, the company will do its best to tackle this issue and will do its best to mitigate this impact and will continue to do so. Every factory has the duty to reduce carbon emission by all means.

(ii) Destruction of forest/habitat

Another significant cumulative impact is the destruction of forest and habitat. As mentioned earlier forest has to be cleared for the construction of access road and for the construction of the factory and facility. This impact ceases after construction. But the clearing of forest has to be continued for the preparation of quarry sites. When all the limestone is quarried out the quarry has to move to another site and more clearing of forest has to be done. After 2 or 3 decades the cumulative impact on the flora will be very significant.

It can be simply stated that 513.16 acres of habitat (project site) will be in one way or another lost or destroyed.

However, since flora/forests are living natural resources the negative impact can be reversible.

The compensatory planting of trees and the reforestation of the affected areas and affective/rehabilitation will surely tackle most of this issue. Biological or living resources are renewable to a great extent.

(iii) Loss of non-living natural resources

Another significant cumulative impact is the loss of non-living resources, limestone, clay, and iron ore. The annual requirements for limestone, clay and iron ore are 2,306,800 tons, 259,900 tons and 100,000 tons respectively. These will be extracted from this area and therefore these resources will be lost for ever (Gypsum and coal are procured from elsewhere). When these figures are multiplied by 30 years the result will be staggering (e.g. 69,204,000 tons of limestone). These raw materials are non-living ones and are not renewable. The impact and loss is irreversible and inevitable – the only plausible way to try to achieve sustainable extraction of these non-living resources as practical as possible.

(iv) Accumulation of overburden, pits, dents, etc.

Another significant cumulative impact is accumulation of great mounds of overburden and pits, and dents here and there in the area after the completion of quarry works. If not well-managed in the first place this cumulative (incremental or successive) impact can be serious. Ugly mounds of overburden, and pits and dents will remain all over the places.

But this cumulative impact can be effectively mitigated. Backfilling of pits and dents with overburden and top soil, leveling of ground, compensatory planting of trees can tackle this issue (already mentioned earlier). The company will not wait until the completion of the long Operation Phase. When work at a quarry site is finished restoration of the soil, replanting of trees and rehabilitation of the ecology of the effected spots will be duly undertaken without hesitation.

(This will be reported in other EIA report concerning mining).

(v) Minor accumulative impact

Waste in the form of cement/clinker dust, fly ash and down ash are generated. But on the whole the quantity generated is small: the production of 1 ton of Portland cement generates only 20-50 g of dust and at most 1 kg of waste, it is learnt. This can be mitigated/quite effectively (already mentioned earlier). However if not well-managed the accumulative impacts of dust and ash over the long years can be quite substantial.

7.2.3 Description of measures to mitigate the project contribution to the cumulative impact

It is not realistic to let impacts accumulate for many years and then take mitigation once later. The best way is to take preventive measures in the first place; that is to take timely mitigation measures for each and every impact regularly, weekly, monthly, yearly and do not let impacts to accumulate.

Emission of PM₁₀, PM_{2.5}, SO₂, NO_x can be mitigated and if mitigation measures are duly taken regularly there can be no accumulating of PM₁₀, PM_{2.5}, SO₂ and NO₂. (It is not practical to mitigate CO₂; the only plausible way is creation of green belt in the vicinity to sequester CO₂).

The Cumulative impact on habitat can be mitigated and reversed. Undertake compensatory replanting of trees (reforestation) in all disturbed area. The habitat can be restored; but it will take time (quite a long time).

The loss of non-living natural resource e.g. limestone, clay, laterite cannot be mitigated or reversed. Since they are non-living resources they cannot regenerate like plants; they will be gone for ever. The only plausible mitigation is not to over exploit these resources; do not extract them more than necessary; sustainable extraction of these non-living resources is a must.

Overburden, pits, dents – If not manage large mound of overburdens and ugly pits and dents will remain after Operation Phase. But these can be mitigated in a timely manner. Backfill pits and dents with overburden and the issue are effectively tackled. There can be no accumulation of overburden, pits and dents. (This will be described in another EIA report on mining for production of cement).

Commitment

The project proponent, Young Investment Group Industry Co. Ltd, is committed to taking effective mitigation measures and management measures for solid wastes and liquid wastes in a timely manner so that there will be no incremental(Successive) cumulative impact over the years.

Daw Hla Myat Thu

Director

Young Investment Group Industry Co. Ltd

8. ENVIRONMENTAL MANAGEMENT PLAN

Objectives

Environmental Management Plan (EMP) is the key to ensure that the environmental quality of the area does not deteriorate due to the implementation of a project. EMP involves the management of overall environmental issues, including the physical, biological, socio-economic, cultural and visual issues.

The negative impacts and subsequent mitigation measures to be taken are integral parts of EMP. EMP has to be based on all impacts and their subsequent mitigation measures to be taken, big or small. Therefore, EMP is a frame work for the implementation and execution of mitigation measures.

The objectives of EMP are:

- To ensure that mitigation measures are implemented.
- To establish systems and procedures for this purpose.
- To monitor the effectiveness of mitigation measures.
- To ensure compliance with environmental laws and regulations.
- To take any necessary actions when unforeseen impacts occur,

8.1 Project description by project phase

This has been already described earlier in Chapter 4. This will be summarized as follow:

During the Preconstruction Phase

The main tasks during this phase are planning and paper work.

Paper works involve obtaining approval and permits from different governmental departments.

Planning and design works involve planning for construction of the cement factory and associated buildings and structure. The engineers from a Chinese contractor firm and company's engineer are deployed for the drawing of layout plan and designs for the factory and all associated buildings and structures (including office, housing for staff, basic infrastructure for water and electricity). Also selection of sites for mining of limestone, clay, iron ore and other raw materials and procurement plan for all other raw material – e.g. gypsum, coal, plan for procurement of a variety of building materials and procurement of eco-friendly machinery, equipment and vehicle, required for the long term operation of the project. This phase will last for (1) year, (estimated).

During the Construction Phase

The main task is the construction of the cement factory complex and other associated buildings and structures, mentioned above. Engineers from a Chinese contractor firm and the company's engineers are involved in the construction of the cement factory and all other associated buildings and structures.

Another task is mine development works at Mya Leik Taung Mountain for mining of limestone and extraction of clay and laterite at an adjacent site (selection of sites for mining an extraction and construction of access road, level roads, etc.). There will be a separate EIA report for limestone.

This Construction Phase will last for 2 years.

During the Operation Phase

After construction the factory will be test run under the supervision of Chinese engineers. After that the factory is managed and run by the company's engineers. (Chinese engineers will be hired from time to time as required).

The main works during this Operation Phase will be the sustainable Operation of the factory, the production of Portland cement and the repairs works. Cement is not exported but only for local markets.

Another main work is the mining and extraction of raw materials (limestone, clay, and laterite) from the nearby mining/extraction sites and the regular procurement of gypsum, coal and fuel oils as required.

It is expected that the Operation Phase will last for 25 years (or extendable).

During the Decommissioning Phase/Rehabilitation Phase

During this phase the cement factory will be decommissioned. Another main task is mine closure at mine site (There is a separate EIA report for mine closure).

A decommissioning contractor and party will be hired for decommissioning work and for tidying up the place. Decommissioning works involve:

- Factory isolation and shutdown
- Dismantling and demolition of the factory complex and all other buildings and structures.
- Materials (building materials) that can still be used will be reused or put up for sale; there that are no longer useable will be disposed at the landfill.

- Some useable machinery will be put up for sale; some that are no longer useable will be made into scrap and sent to smatter contaminated soil, if any, will be removed.
- The factory compound will be transformed into a green belt (planting trees).
- Soil, air and water will be tested for the last time, to ensure that no contaminates left.

Since this phase will come 25 plus years from now the company has not decided yet whether to reuse the site or not.

8.2 Project's environmental, socio-economic and, where relevant, health policies and commitments, legal requirements and institutional arrangements

Environmental, socio-economic policy/principle commitment, legal requirement and institutional arrangement ECD are already described in Chapter-3. As this is not a standalone EMP report these will not be repeated here.

Only Health policy and institutional arrangement will be described. (The project proponent will adhere to the environmental, socio-economic policy of the government).

Health policy

The health policy of the Nation is "Health for All".

The policy guidelines for health service provision and development have been provided in the constitution. **Article-28** of the constitution of the Republic of Union of Myanmar (2008) States that:

The Union shall:

- i) earnestly strive to improve education and health of the people

Article 367:

Every citizen shall, in accord with the health policy laid down by the Union, have the right to health care.

National Health Policy (1993)

The National Health Policy was developed with the guidance of the National Health Committee in 1993.

The National Health Policy has placed "Health for All" goal as a prime objective. There are 15 main points regarding the National Health Policy (1993). The first main point No.1 is:

- to raise the level of health of the country and promote the physical and mental well-being of the people with the objective of achieving "Health for All"

The main point, No.9 concerns environment which states:

- to intensify and expand environmental health activities including prevention and control of air and water pollution

Health Legislation

Certain portion of health legislation also addresses environmental sanitation and communicable disease prevention, as far as environmental affair is concerned. That includes the control of disposal of human and other wastes, concerns for water purity and hygiene of housing and food sanitation.

Certain health legislation that are relating in one way or another, to environmental affairs are:

- The Public Health Law (1972)

Which includes environmental sanitation and cleanliness of food, among others

- Prevention and control of communicable Diseases Law (1995) (Revised 2011)

This law describes measures to be taken in relation to environmental sanitation, among others.

- The control of smoking and consumption of Tobacco Product Law (2006)

This law describes the creation of tobacco smoke free environment, among other. This is of relevant at the work place and project site where many employees are working.

Health Development Plan and Myanmar Health Vision 2030

This long term plan has been drawn up to meet any future health challenge. This plan has 9 main objectives and one of them is:

- to develop a health system in keeping with the changing political, socio-economic and environmental situations

National Environmental Health Agenda

Environmental Health is actually one of the integral parts of Environmental Protection and Conservation aspects. EIA, IEE and EMP works normally encompass the physical, biological, socio-economic, cultural and visual components of the surrounding environment. The third component, that is, socio-economic, includes public health component, (mortality and morbidity, diseases, accident and injuries etc.).

Environmental, Health and Safety (EHS)

The International Finance Corporation (IFC), a division of World Bank, has prescribed EHS general guidelines for general industrial practices. It provides guidance to users on EHS issues in doing their business.

The applicability of the EHS guideline shall be tailored to the hazards/risks or impacts identified as the result of EIA.

The IFC's EHS General Guidelines encompass Environmental Health and Safety (EHS), Occupational Health and Safety (OHS) and Community, Health and Safety (CHS).

Environmental health and safety (EHS)

EHS covers the following:

- a) air emission and ambient air quality
- b) energy conservation
- c) waste water and ambient water quality
- d) water conservation
- e) hazardous materials management
- f) waste management
- g) noise management and
- h) contaminated land management

Occupation Health and Safety (OHS)

The Occupation Health and Safety guideline by IFC encompasses:

- general facility design and operation
- physical hazards
- chemical hazards
- biological hazards
- radiological hazards
- Personal Protective Equipment (PPE)
- special hazard environments
- communication, training and monitoring

Community Health and Safety (CHS)

The Community Health and Safety guideline by IFC encompasses:

- water quality and availability
- structural safety of project infrastructure
- life and fire safety L&FS
- traffic safety
- transport of hazardous materials and disease prevention
- emergency preparedness and response

Commitment

The project proponent, Young Investment Group Industry Co., Ltd has made a commitment for doing an environmentally sound business and it will strictly comply with the NEQEG (emission) guideline values (2015) prescribed by ECD.

Moreover, the project proponent will abide by the laws described earlier in Chapter 3, (3.2.2).

The project proponent will duly implement all mitigation measures for each and every impact mentioned in this report.

The company will avoid by all means any impact on the social economic component of the surrounding environment as far as possible.

Daw Hla Myat Thu

Director

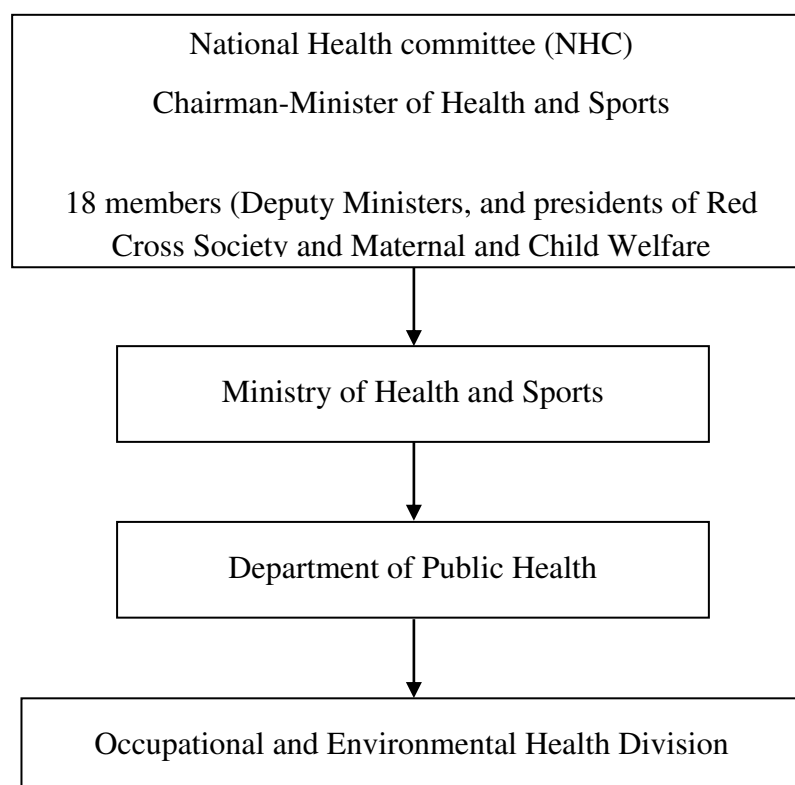
Young Investment Group Industry Co. Ltd

Legal requirements

This has been already described in detail earlier in Chapter-3, including among others, applicable laws and rules, requirements, national and international standards and guidelines. These will not be repeated here.

Institutional Arrangement

Institutional Arrangement (organization) of NHC



The National Health Committee (NHC) is an umbrella organization comprising 18 members from 9 ministries and one member of Nay Pyi Taw Council, and presidents of Red Cross Society and Maternal and Child Welfare Association.

The Chairman of NHC is the Union Minister of Health and Sports while the Vice Chairman is the Union Minister of Labour. 9 deputy ministers under 9 ministries, a member of Nay Pyi Taw Council, the president of Red Cross Society, and the presidents of Maternal and Child Welfare Association are also members of NHC.

The Deputy Minister of Health and Sports is the secretaries while the Director General of Department of Health Planning, is the Joint secretary.

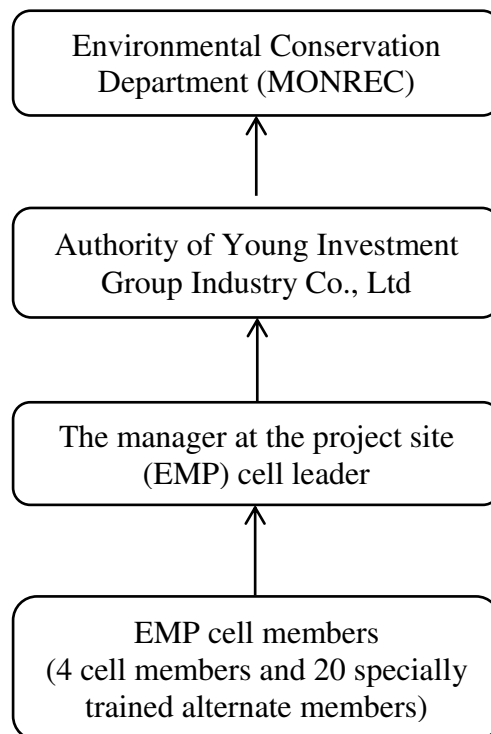
The Occupational and Environmental Health Division (OEHD) under the Department of Public Health is the focal agency involves in environmental and health affairs.

The Occupational and Environmental Health Division is involved in implementing Environmental Health Programme in the country.

At the moment it is involved in:

- Environmental monitoring: on air quality and water quality
- Medical monitoring: health assessment on workers (periodic medical examination, performing physical examination, chest X-ray, biomarker survey on workers)
- Work place assessment: eg- on air quality, waste (solid) and waste water, heat stress and light, noise level, soil quality, water sanitation and hygiene etc. in certain factories.
- Assessment of environmental health probably related to climate change and general health impact assessment.

The institutional arrangement for implement of EMP, MP and mitigation



EMP cell members and alternate member will be fully involved in execution of EMP. EMP cell leader will report to the company's authority. The company's authority will report to ECD on a regular basis, preferably every six months (semi-annually).

8.3 Summary of impact and mitigation measures

Mitigation is an integral part of EMP and therefore, EMP has to be based on each and every impact and subsequent mitigation measure. (EMP and mitigation are the different side of the same coin.

These have been already described in technical detail earlier in Chapter-6, (6.2.1.1, 6.2.1.2, 6.2.1.3, 6.2.1.4). Mitigation measures to be put in place for all impacts are also described in meticulous details in Chapter-6. These will not be repeated here as this is not a standalone EMP report. Only enumeration of the impacts/potential impact is made as follow.

Impacts and mitigation measures is summarized in tabulated form below:

During the Preconstruction Phase

Sr No.	Impact/potential impact	Mitigation
1	Potential polarization of locals into pro-project and anti-project groups due to instigation by activities and/or radical environmentalists.	<ul style="list-style-type: none"> - no quick fix measures for this potential social impact - build good relation with the local community - implement CSR programme
2	The potential hiking of price of land and property	<ul style="list-style-type: none"> - not mitigatable (no remedy for inflation) - staff of the company must not get involve in land price speculation

During the Construction Phase

Sr No.	Impact	Mitigation
1	Impact on air environment	<ul style="list-style-type: none"> - Comply with ECD's NEQ emission guidelines - Plan in the Pre-Construction Phase for the procurement of equipment, vehicles that emit less smoke (to be certified for emission compliance) - Keep equipment and vehicles well-maintained, well-operated and well-lubricated to reduce smoke emission - Use machinery and vehicle with low emission rate; use fuel with low sulphur content - Avoid open burning of debris - Spray water for suppression of dust - Restrict vehicular movement; maintain road clear of mud and dirt - Provide PPE to workers who are exposed to smoke or dust for long period

2	Noise and vibration	<ul style="list-style-type: none"> - Plan in the Preconstruction Phase for procurement of equipment, and vehicles that emit lower noise level - Comply with ECD's NEQ guidelines for noise level - Avoid construction work at night - Provide PPE to workers exposed to prolonged high noise level - Manage vibration of machine, equipment and vehicle; - Limit the speed of vehicles
3	Impact on land environment	<ul style="list-style-type: none"> - During earth work the top soil should be separately stockpiled from other sub-surface soil or rocks - Top soil should not be used for maintaining access road or for building - Stockpiles of top soil should be grassed or allowed to naturally vegetate for stabilization and prevent erosion - During rehabilitation top soil should be effectively used to promote the natural growth of vegetation; - Oil spilled should be cleaned up immediately; do not wash down with water but used absorbents or saw dust - Vehicles and machinery should be adequately maintained to prevent fuel leaks resulting to soil contamination - All waste materials (earth, rocks) resulting from construction work should be disposed of at a designated spot - Solid waste and liquid waste from field camp should be also disposed of at designated spot - Educate and train the workers for good house keeping practice; do not litter; do not pollute the area - Avoid the destruction of soil profile and soil structure as far as possible
4	Impact on water environment	<ul style="list-style-type: none"> - Avoid water bodies as far as possible when constructing or upgrading area roads - Storage of fuel oil as well as used fuel oil should be done in a designated bunded side until removal - Maintain vehicles and machinery adequately to prevent spillages resulting in surface water contamination - When handling fuel oil avoid accidental spillages into the surface water; should spillages occur implement appropriate clean up immediately - Avoid disposing of waste (both liquid and solid) into water bodies; only release waste water if quality is acceptable or after treatment - Top soil should be allowed to naturally vegetate in order to stabilize soil particles and thus preventing erosion and limiting siltation to surface water

5	Impact of waste	<ul style="list-style-type: none"> - Avoid open burning of debris - Educate workers for good housekeeping; do not litter - At the end of Construction Phase put up construction spoils, left over materials for sale - Avoid spillage of fuel oil-; should spill occur immediately clean by means of absorbent or saw dust (do not wash down with water) - Plan for management of temporary latrines for worker camps; regularly spread soil or ash into the pit; back fill all latrines after completion of Construction Phase - Prevent spill of fuel oil and chemicals; clean up spill with absorbent promptly (do not wash down with water) - Properly instruct workers with respect to handling of fuel and chemical and clean up of spills - Bund fuel or chemical depot to prevent spreading of spill - Avoid spillage and percolation of any waste water into ground water - Manage the hygienic condition of the temporary latrines and back fill the pits when no longer use
6	Impact on biodiversity	<ul style="list-style-type: none"> - Do not clear vegetation than necessary for the construction of access road; restrict the removal of vegetation; avoid as far as possible the cutting of big trees - Control and minimize dust and eventual disposition of dust on leaves on plants restricting photosynthesis - Restrict the collection of fire wood; do not cut trees for fuel wood but collect fuel wood from fallen trees, dried logs or branches or use charcoal for cooking - Avoid open burning of debris - Educate workers for fire awareness and protection; prohibit the discard of burning cigarette butts carelessly; get rid of all debris that can cause fire - Promote environment awareness to workers - Restrict vehicular movement to the access road to prevent habitat disturbance of birds and animals - Prohibit the hunting and/or trapping of wild animals big and small including rodents, birds, reptiles and amphibians by workers - Avoid the use of excessive bright light for long hours at night to prevent the aggregation and eventual death of large number of insects (offensive bright light in the forest at night will also scare away wild animals from their natural foraging or breeding ground)

7	Occupational health and safety issue	<ul style="list-style-type: none"> - Organize and provide first aid training and fire prevention and fighting training - Provide adequate First Aid Kit, and Fire extinguishers; keep water tanks always full for fire-fighting - Phone numbers and address of Red Cross Society, Ambulance service, Fire Brigade, Police station, Mandalay Hospital etc. must be displayed so that everyone could easily see - Create safety condition for work places - Educate and train workers for good working practice, good engineering practice, good safety practice and good house keeping practice - Plan and implement prompt admission of seriously sicked and injured worker to nearest hospital. - Prevent and avoid accidents and try to achieve zero accident at work places - Educate and train them for health education and hygiene
8	Potential social issue	<ul style="list-style-type: none"> - Educate and discipline the workers; apply punitive measures such as suspension of the wrongdoer - Educate the workers on appropriate behaviour in the local community pertaining to local customs and etiquette for healthy community interaction - Strictly prohibit the drinking of alcohol in the site - Apply punitive measures for the wrong doer - Maintain the good on-going relation between the company and the locals - Conduct public consultation so that the locals will have a positive perception on the project - Plan for the management of STD - Organize and educate workers - Made condoms readily available for workers - Separate housing for men and women employees - Ask the construction contractor to discipline his workers - Apply punitive measures for sexual offences - Educate workers for health education and hygiene
9	Potential security issue	<ul style="list-style-type: none"> - Effective walling of the compound - All accesses must be controlled; set up security gates, adequate guards - Do not let the workers (mostly construction workers) enter the neighbouring village, without preauthorization; do not let workers mingle freely with locals - Store building materials under lock and key as far as possible - Ask the building contractor to discipline his workers - Apply punitive measures, such as suspension or termination of employment if necessary

During the Operation Phase

Sr No.	Impact	Mitigation
1.	Impact on air environment	<ul style="list-style-type: none"> - Comply with ECD's NEQ emission guideline - Do not clear the vegetation (grass) and leave the land have more than necessary - Consolidate and compact all area to prevent generation of dust due to wind - Spray water adequately to suppress dust - Reduce the speed of vehicle to reduce dust generation - Restrict vehicular movement; maintain road, clear of mud and dirt - Avoid open burning of debris or solid waste - Keep equipment and vehicles well- maintained to reduce smoke - Use fuel with low emission rate (eg. fuel with low sulphur content) - Install covers on conveyor belt to minimize dust generation - Install 58 bag filters to mitigate PM (the company will do this) - Apply complete combustion to reduce SO₂, NO_x and other - Regularly collect down ash and cement dust for reuse - Minimize by all means the generation of dust (PM) at the conveyor line, at clinker (cement dust, clinker dust) and also at the cement packaging department; also at storage and haulage of cement bags - Provide PPE (eg. face masks, mouth and nose covers, and gas masks) to workers exposed to long hours of dust and smoke; fit excavator with air conditioned cabin for operators. - Conduct regular general medical check-up for all workers annual. - Also conduct regular specific medical check-up for workers exposed to long hours of dust emission; especially for respiratory tract and lung ailments. In addition conduct lung function testing for them at least every 6 months (semi-annually) with the aid of medical specialist.
2.	Noise and vibration	<ul style="list-style-type: none"> - Comply with ECD's NEQ noise level guidelines - Restrict or limit vehicular and heavy machinery movements - Plan for appropriate choice of machinery and vehicles (that emit low noise level); method of working, efficient material handling - Well-operated and well-maintained vehicles and machinery generate lower noise level and prevent undesirable noise level - Develop green belt (plant trees) around the mining site and factory; trees abate noise and serve as noise sink (pollution sink) - Create smooth road surface as far as possible to mitigate vibration due to vehicular and heavy machinery movement

		<ul style="list-style-type: none"> - Create suitable foundation design for machinery and equipment to mitigate vibration - Provide adequate PPE eg. ear muffs, ear protectors to workers exposed to long hours of high noise level; fit excavator, bulldozer with air conditioned cabin for operators - Conduct regular noise monitoring to ensure that the levels are within noise exposure standard (not higher than 85-90 dBA)
3.	Impact on land environment	<ul style="list-style-type: none"> - Plan for effective management for systemic stockpiling of mined out limestone, minimize impacts on the environment - Do not clear vegetation more than necessary for stockpiles - Keep top soil and overburden separately - Manage for the stockpiling of lime stone; no spill over, no sliding, no erosion, no blocking of natural drainage system; no entering into river, cultivated areas and village area - Never choose a slope as a dumpsite but level the slope first for stabilization - Let the grass or herb grow on the overburden for stabilization biologically (spread a thin layer of top soil on overburden) - If possible construct retaining wall to stop erosion or sliding; - avoid dumping of solid wastes on open ground - avoid dumping of liquid wastes on the ground - use landfill
4.	Impact on water environment	<ul style="list-style-type: none"> - There is a river nearby ;manage so that activities will not impact the surface water - Manage for the stability of top soil and overburden to prevent erosion and sliding and siltation; not to impact surface water flow dynamic or alter water courses and not to impact on aquatic biodiversity - Fuel oil depot should be away from a river; the depot should be bunded to protect surface water from oil spill - When handling fuel oil avoid accidental spillages into surface water; should spillage occur implement appropriate clean up immediately - Avoid disposing of waste (liquid and solid) into water bodies - Manage water conservation; reduce water consumption; if possible use recycle water for dust suppression and watering plants; harvest rain water - Plan and manage to prevent the contamination of soil and eventually groundwater - For storage of fuel drip trays and designated bunded site should be used to protect soil (and hence ground water) from hydrocarbon

		<ul style="list-style-type: none"> - Adequately maintain vehicle and machinery to prevent spillages resulting in groundwater contamination - Avoid spillage during the handling of fuel oil - Should accidental spillages occur implement appropriate clean up immediately; do not wash down spill with water; use absorbents or saw dust for clean up
5.	Impact of waste	<ul style="list-style-type: none"> - Track all wastes generated, especially cement dust, ash and all other domestic wastes - Instruct workers for proper handling and disposal of wastes eg. at the landfill - Follow the 5 Rs principle: reduce, reuse, recover, recycle and redesign, wherever possible - Separate solid waste into categories, use separate bins, disposed at approved landfill - Draw up a plan for the management of waste water - Reduce and minimize the use of water; - Educate and train workers for conservation of water - Wash vehicles and equipment in designated area - No disposal of waste water outside (on land or into water body) - Treat all waste water before discharge - Educate and train workers for good house keeping practices
6.	Potential impacts on traffic	<ul style="list-style-type: none"> - Draw up a traffic management plans (even though the traffic was light; road users were mostly motorcyclists and pedestrians) - Schedule the logistics especially for trucks - Set up speed limit - Avoid overloading truck - Cover haulage (cement bags, coal, gypsum etc) with tarpaulin - Educate the driver (especially heavy trucks drivers) for driving at reduced speed and adhere to the principle of defensive driving - Try to achieve zero road accident
7.	Occupational health and safety issue	<ul style="list-style-type: none"> - Plan and manage for safe working environment - Try to achieve zero accidents at work place - Educate and train workers for good working practice, good safety practice and good health and hygiene practices - Limit the exposure to heat at kiln (minimum exposure) as practical as possible; remotely regulate and control - Provide adequate PPEs for workers who are exposed to heat, dust, smoke, loud noise etc. - All workers must pass a medical examination in the first place before being employed. - Implement safe and effective procedures for storage, transportation and handling of hazardous materials

		<ul style="list-style-type: none"> - Have detail plan for prevention of fire and emergency - Organize basic First Aid Training and Fire Fighting Training - Provision of firefighting equipment - Set up a factory clinic - Provision of First Aid Kits, medicines and drugs - Display addresses and phone numbers of Fire Bridge, Ambulance Service, Red Cross Society, Hospital and Police Station so that every can see easily - Take out insurance for the cement plant and also fire insurance
8.	potential social issue	<ul style="list-style-type: none"> - Draw up a plan for management of ill social behaviour and social illness - Educate workers to be good workers; dutiful and well disciplined - Proper training on work place regulation, code of conducts; - Educate workers on appropriate behaviours when dealing with locals; maintain healthy community interaction - Apply punitive measures such as suspension of the wrong doer - Strictly prohibit the drinking of alcohol during working hours - Deal with employees on a fair and square basis - Avoid unhealthy relationship between employer and employees eg. no case of over worked and underpaid - Maintain good relation with the locals.
9.	Potential security issue	<ul style="list-style-type: none"> - Deploy adequate security personnel day and night; implement strict security - Check all entering and leaving of the factory premise - Provide uniforms and ID for all workers for easy identification - Security should be both for the cement factory and premise and the facility
10.	Visual impact	<ul style="list-style-type: none"> - The company will keep in mind for visual appeal of the buildings and structures. - Eye pleasing paints will be selected (bright red and yellow colour will not be selected). - Blue or green roofings will be selected. - Will use only yellow dim light instead of white bright light. - Plant fast growing trees around the factory; create green zone.

During the Decommissioning/Rehabilitation Phase

Sr. No.	Impacts	Mitigation
1.	Occupational health and safety issue	<ul style="list-style-type: none">- Plan and manage for effective decommissioning of site.- Hire decommissioning contractor to do the work.- Dispose materials that are no longer useable; redeploy or put up for sale those that are useable.- Restore the ground and soil profile.- Revegetate and rehabilitate the ground; plant trees.- Remove and clear all debris and tidy up the place.- Backfill all dents, pits and depressions; level the ground and restore the soil
2.	Potential residual impacts	<ul style="list-style-type: none">- Plan and manage for effective decommissioning and rehabilitation.- Clear and remove all residuals, if any.- Remove all soil contaminated by fuel oils or chemicals; if any.- Test the air, water and soil for the last time- Test the soil; ensure that no contaminants remain.- Also test the stream water for possible pollutant.- Restore the soil to its natural condition.- Revegetate and rehabilitate the site.

8.4 Overall budget for implementation of the EMP

Since EMP involves the management of all environmental issues there have to be adequate budget for the implementation of EMP.

This budget will be only for the implementation of EMP but it will cover the procurement of certain devices, and equipment for uses in monitoring and certain materials for uses in emergency aspects eg. PPEs first aid facility medicines etc.

In order to effectively execute EMP and MP the company has set up a fund for the implementation of EMP and MP (in addition to a separate fund for the implementation of CSR). 0.5 percent of the project budget equivalent to USD 1,280,536 is set aside for EMP fund which will cover the initial costs and the recurring expenses for the effective implementation of EMP and MP.

8.4.1 Fund for EMP

The sub-budgets allotted for each programme under EMP are as follows:

- Cost for organizing EMP - 2% of EMP fund (USD 25,610)
- Cost for execution and dissemination of EMP in the form of:
 - (c) Taking mitigation action - 25% of EMP fund (USD 320,134)
 - (d) Monitoring action - 25% of EMP fund (USD 320,134)
- Cost for procurement of equipment and materials - 20% of EMP fund (USD 256,107)
- Cost for capacity building and training - 7% of EMP fund (USD 89,637)
- Cost for emergency/contingency (allotted for probable emergency cases) - 10% of EMP fund (USD 128,053)
- Cost for documentation and reporting - 8% of EMP fund (USD 102,442)
- Miscellaneous (casual fees for two villagers, who are members of EMP cell) - 3% of EMP fund (USD 38,416)

Labour cost will be kept at a minimum. Only staffs will be involved in the implementation of EMP. Staff will be first trained for this EMP purpose.

Most of the EMP fund will be used up for the procurement and operation of equipment and materials that are essential for the execution of EMP. eg. firefighting equipment such as fire extinguishers, water jet pumps and other accessories; Personnel Protective Equipment (PPEs) such as out fit, helmet, boot, gloves, goggles, mask, ear plug/ear muff, etc. And also portable equipment for casual measurement of water and air one water pond for firefighting shall be also constructed. In addition adequate First Aid Kits with adequate medicine and drugs and other First Aid Kit accessory will have to be purchased.

Most of the EMP fund will be used up for the implementation of mitigation measures (which an integral part of EMP) and implementation of MP (which is also integral part of EMP). Mitigation and Monitoring have to be carried out almost on a routine basis or daily basis, and that is why a large percentage of EMP has to be used. Sometime experts and/or technicians have to be hired since certain physical and chemical parameters cannot be tested or measured by the staffs of the company.

For capacity building and for training for emergency trainers from Fire Brigade and trainers from the Red Cross Society will have to be hired.

The cost for emergency/contingency programme is difficult to estimate. Unfortunately if a major accident happens this fund has to be considerably increased.

The above mentioned cost estimation is based on the current unit price. Because the project will be implemented over many years (even decades) price fluctuation and inflation will be unavoidable. A contingency amount shall be prepared for any unavoidable event in the future.

8.4.2 Organization to implement EMP

Finally, to effectively carry out the EMP works a small nucleus organization, the EMP cell, will be formed.

EMP cell

An EMP cell (a small nucleus organization) is formed for the effective implementation of EMP and MP. The cell members include the manager, who doubles as the EMP cell leader, 2 engineers, and 2 technicians. This EMP cell is also the monitoring committee. Two local villagers are added to this monitoring committee.

Young Investment Group Industry Co., Ltd will form the EMP cell as follows:

Sr. No.	Name	Designation	Responsibility
1.	U Nyi Nyi Tun	Head of cement factory	EMP cell leader
2.	U Pyi Thein Kyaw	Deputy General Manager	EMP cell member
3.	U Zaw Thein	Engineer	EMP cell member
4.	U Maung Htwe	Technician	EMP cell member
5.	U Aung Kyi	Technician	EMP cell member
6.	U Kan Sa	Member of village administrator, Nat Yay Kan village	EMP cell member
7.	U Maung Than	Member of village administrator, Kandwin village	EMP cell member

Later 15 staffs will be added to the list of the EMP cell members, as alternate members. They will be specially trained for implementation of EMP involving taking mitigation measures, conducting monitoring and other EMP duties.

The monitoring works will cover the Construction Phase, Operation Phase and Decommissioning Phase of the project life. The EMP cell leader (monitoring committee leader) and members are responsible for execution of the EMP and monitoring programme.

They will be specially trained for doing this. As for monitoring specific parameters eg- air quality, water quality and soil, technicians or experts from Yangon shall be hired to do the analysis works.

It is not pragmatic for the EMP members, especially the five employees, of the company to get involve solely in EMP and MP activities because their main task is running the cement factory work while EMP and MP activities are actually supplementary works. The company shall not be in a position to set aside 20 well-paid employees just to engage in EMP or MP work alone; it will otherwise result in under-staffed situation for the project. Therefore the EMP cell leader and members have also to get involve in the routine operation work as far as possible. An additional 5 employees will be deployed as assistant to EMP cell members, where necessary.

1. U Nyi Nyi Tun (Head of cement factory)

- (i) He will doubles as EMP cell leader.
- (ii) Overall environmental officers; responsible for all social and environmental issues arising from the activities at the factory.
- (iii) Monthly meeting with all EMP cell members and 15 specially trained workers.
- (iv) Gather monthly information/data from 4 full time EMP cell members (2 villagers excluded).
- (v) Writing monthly report and submit the report to the company's authority.
- (vi) Submit a special quarterly report to the company's authority.

2. U Pyi Thein Kyaw (Deputy General Manager)/EMP cell member

- (i) Designated as environmental security officer.
- (ii) Responsible for all environmental issues arising from the activities at the factory.
- (iii) Supervision of EMP activities including monitoring works and execution of mitigation measures.
- (iv) Also participate (personally involve) regularly in EMP, MP and mitigation works.
- (v) Provide monthly data/information to EMP leader (Myanmar).

3. U Zaw Thein (Engineer)/EMP cell member

- (i) Designated as work place security officer.
- (ii) Responsible for all social issues arising from the activities at the factory.
- (iii) Co-supervision of EMP activities including monitoring works and execution of mitigation measures.
- (iv) Regularly supervize activities at work places.
- (v) Also participate regularly in EMP, MP and mitigation works.
- (vi) Provide monthly data/information to EMP cell leader.

4. U Maung Htwe (Technician)/EMP cell member

- (i) Designated as liaison officer for dealing with locals
- (ii) Responsible for social issues, if any, coming from the local community.
- (iii) Co-supervision of EMP, monitoring works undertaken by 8 trained workers.
- (iv) Also participate in EMP, and MP works.
- (v) Provide monthly data/information to EMP cell leader.

5. U Aung Kyi (Technician)/EMP cell member

- (i) Co-supervision of EMP, especially mitigation works undertaken by 7 trained workers.
- (ii) Also participate in EMP especially all mitigation measures taken.
- (iii) Supervize and participate in monitoring of water, fuel and electric energy consumption; regulate consumption.
- (iv) Provide monthly data/information of EMP cell leader.

6. U Kan Sa (Village Administrator of Nat Yay Kan village)/EMP cell member

- (i) Appoint to monitor the transparency regarding the activities at the factory
- (ii) Work as part-time in environmental monitoring works (no fixed working days or hours).
- (iii) Monthly regular visual inspection of activities.
- (iv) Provide information about the factory to fellow villagers on a regular basis every 2 or 3 months.

7. U Maung Than (Village Administrator of)/EMP cell member, part time

- (i) Appoint to monitor the transparency regarding the activities at the factory
- (ii) Work as part-time in environmental monitoring works (no fixed working days or hours).
- (iii) Monthly regular visual inspection of activities.
- (iv) Provide information about the factory to fellow villagers on a regular basis every 2 or 3 months.

8. 15 specially trained workers:

- 8 to be fully involved in monitoring work
- 7 to be fully involved in taking mitigation work.

The EMP cell members and 15 specially trained workers will also involve in regular works (production works) as practical as possible.

8.4.3 Occupational Hazards

Physical hazards

The most common risks are trips and falls caused by slippery floor, stairs and platform.

Other physical hazards involve contact with process machine (E.g. milling machine, moving machine, rotating machine etc.) and all kinds of occupational accidents at work places. That can lead to injury and deaths.

Accidental fire and explosion (e.g. from fuel depot, from kiln) are also major physical hazards.

Mitigation/Corrective measures

- The project proponent will take measures to prevent, control and mitigate all physical hazards and risks as practical as possible.
- First of all, workers will be educated and trained for good safety practice, good working practice, basic hazards awareness and site specific awareness and awareness regarding all physical hazards and risks.
- Create a safe working environment and a safe working place by all means.
- Try to achieve zero accident at all work places.
- Prevent potential occupational health issue by all means.
- Educate, train and supervise workers for the safety handling and operation of equipment; also safety storage, handling and uses of fuel oil chemical and hazardous materials, if any.

Dust

Dust is a kind of physical hazards and occupational hazards.

In the cement factory cement dust is a real health issue. Cement dust is generated at storage area, at preparation of raw material area, at final product packing area and also during transportation.

Dust is also generated at crusher site and also from vehicular movement inside the factory compound.

Prolonged exposure to dust or inhalation of dust can cause asthma, bronchitis, and respiratory tract ailment and lung diseases.

Mitigation/corrective measures

- Provide PPE, e.g. face mask (mouth and nose covers) for workers exposed to dust.
- Sweep the working area clean of dust.
- Provide good ventilation for work places.
- Spray water for suppression of dust.
- Cover truck with tarpaulin during transportation.
- Cover conveyor belt (tubular conveyor belt).

Heat

Heat is occupational hazards and physical hazards. Heat is generated from preheater unit and especially at kiln.

Worker exposed to heat can suffer from dehydration and other health problem.

Mitigation/Corrective measures

- Worker exposed to heat must be provided with heat resistance outfit, face shield, gloves and boots.
- However, as the operation of factory applies automation system heat may not be a serious issue; kiln will be remotely controlled
- There is no need for worker to work near hot equipment or machinery that generates intense heat.
- Because in automation system every movement or activity is remotely control the Central Control Room. (In old fashion cement factories worker have to work manually near hot equipment).

Noise and vibration

The main source of noise and vibration is at mining/extraction site. Another source of high level noise and low level vibration is at crusher site (crushing, grinding) which is long duration. Relatively high noise levels are also generated raw mill, cement mill also from operation of heavy machinery vehicular movement.

Workers exposed to high noise level for long hours can suffer from hearing impairment or even deafness.

Vibration can cause hand-arm vibration and body vibration effect. Severe vibration can cause damage to buildings.

Corrective/mitigative measures

- Provision of PPEs for workers, e.g. ear plugs, ear muffs; heavy machinery (excavators, dozers, loaders etc.) operators will work in refrigerated cabins. Which are also sound proofs.
- Vibration resulting from activities of heavy machinery and heavy trucks can be mitigated to some extent only.
- Noisier machinery (e.g. crusher) will be isolated to mitigated noise.
- Installation of silencer and vibration abator (absorber) where necessary, where possible.
- Ensure that foundations for machinery/equipment are stable for the long run.
- Install vibration absorber on machine that vibrate violently.

Radiation

Effect of radiation is not envisaged as no radioactive substances are used in cement manufacturing. However, there is the likelihood of occupational exposure to radon due to the handling and uses of limestone as raw materials for manufacturing cement. (Radon is found in limestone rock, it is learnt).

(The project proponent is not in a position to conduct radiation dosimetry and any radiation assessment.).

Chemical hazards and other hygienic issues

No chemical are used for the manufacturing of Portland cement, therefore, potential chemical hazards are not envisaged.

However, small quantities of a variety of chemical are used for quality control testing in the factory's laboratory. As all these chemicals are only for laboratory testing (laboratory uses) the quantity is very small and cannot pose any considerable hazards. After each testing/titration the glass wares are washed down waste water in the laboratory sink and flow down the drain.

Potential hazards such as inhalation of dust, exposure to high level noise and exposure to heat are already mentioned above.

No hygienic hazards or issue are anticipated. Workers are provided with adequate lavatory facility, bath and washing area; provided with adequate potable drinking water, healthy food and clean eating area, and also provided with healthy living spaces and healthy working area. Moreover, workers are educated for good health practice and good hygiene practice.

8.5 Management and Monitoring Sub-Plan by project phase (EIA procedure, Notification No.616/2015, by ECD, Section 63, 8 (8.5))

Both management plans monitoring plan are of paramount importance for the successful implementation of EMP.

The objectives are:

- To measure impacts that occur during the operation the project
- To ensure compliance with statutory requirements
- To determine the effectiveness of mitigation measures and other measures, and
- To assist in the implementation of EMP

Issues or components

Management and monitoring sub-plan encompasses the following issues or components to be managed and monitored.

- Noise and vibration; waste; hazardous waste; waste water and storm water; air quality; odour; chemicals; water quality; erosion and sedimentation; biodiversity; occupational health and safety; community health and safety; cultural heritage; employment and training; emergency response, traffic safety; and aesthetics.

(From EIA procedure, Notification No.616/2015, Section 63, 8 (8.5))

8.6 Contents for each sub-plan (Management and Monitoring sub-plan, MMSP)

In this section (8.6) the content and description of each sub plan that addresses the above-mentioned issues such as noise and vibration, waste, hazardous waste, waste water and storm water and so on are given.

8.6.1 During the Construction Phase

The content for each sub-plan are summarized as follow.

1. Noise and vibration

Objectives

- To reduce/mitigate noise and vibration levels; to create safe working places for workers;
- Not to cause nuisance and disturbances to the local people.

Legal requirement

- Comply with NEQEG (emission) guideline, 2015; code No.1.3

Overview maps, layout maps, images, aerial photos, satellite images

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase.

Management action

- Plan in the Preconstruction Phase for procurement of equipment, and vehicles that emit lower noise level.
- Procure these eco-friendly machinery, equipment, and vehicle.
- Comply with ECD's NEQEG guidelines for noise level.
- Test/monitor air quality regularly
- Install silencers and mufflers.
- Avoid construction work at night.
- Provide PPE to workers exposed to prolonged high noise level.
- Manage vibration of machine, equipment and vehicle.
- Limit the speed of vehicles.

Monitoring Plan

Parameter to be monitor : dBA during day and night time.

Monitoring points - Coordinates:

- Project site : N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0"
- At Nat Yay Kan village : N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5"
- At Kandwin village : N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"

Frequency : Semi-annually (have to hire technicians). Also monitor effectiveness of mitigation measures taken.

Budget and responsibilities

Ks 300,000 (once off cost)

Responsibilities – hired technicians and EMP cell members.

2. Waste

Objective

- To mitigation waste especially construction waste during the Construction Phase.
- Not to pollute environment and not to let residual/remain after construction.

Legal requirement

- Comply with Environmental Conservation Law, 2012 (Section 14, 15, 32); Environmental Conservation Rules, 2014 (Rule 69), to discharge wastes in accord with environmentally sound method.

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase.

Management action

- Manage construction wastes, construction tailing as far as possible.
- After completion of construction works tidy up the site.
- Put up for sale construction materials that are useable, those are left over.
- Discard those that are not useable at the approved land fill of the factory.
- Manage vegetal waste (tree trucks, branches, leaves generated from clearing of forest); give away vegetal waste (trees) to local for fire wood; discard the remainder at approved landfill or incinerate.
- As regard domestic waste at camp regularly collect them in bins and dispose at landfill (or dumping site).

Monitoring Plan

- Monitor the generation of construction waste and domestic waste at the site on a regular basis.
- Monitor the mitigation actions for waste on a regular basis.

Monitoring point: – the whole area of the site.

Frequency: – weekly

Budget and responsibilities

Free of charge. (All EMP cell leader and EMP cell members are well-paid employees of the factory; no extra fees for them; no EMP contractor exist in Myanmar yet for hire).

Responsible

EMP cell leader and EMP cell members.

3. Hazardous waste

Note: No real hazardous waste generated during the Construction Phase.

- Used fuel oils are collected in old drums and gave away to local recyclers.
- Old lamps, bulbs and batteries discarded at landfill.

4. Waste water and storm water

Objectives

- To control, manage and mitigate waste water and storm water;

Legal requirement

- Comply with NEQEG guideline (2015), Code No.1.2 (for waste water, storm water runoff, effluent etc.)

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase.

Management action

- Create systematic drainage at the site to manage waste water; ensure that it does not enter the stream; also to manage storm water.
- Create suitable drainage at site to manage storm water.
- Keep natural drainage of the slope intact; do not block or alter as far as possible. (Ensure that the construction of series of access road, in-mine road, ramps does not damage the natural drainage as far as possible.)
- Avoid indiscriminate discharge of waste water/used water onto the open ground or into the stream.

Monitoring Plan

Parameter to be monitored: BOD, ammonia, arsenic, cadmium, COD, chlorine, chromium, copper, cyanide, fluoride, heavy metals, iron, lead, mercury, nickel, oil and grease, pH, phenols, selenium, silver, sulphide, total coliform, bacteria, phosphorous, nitrogen, TSS, zinc.

Monitoring Point –

- At the drainage, coordinates: N. Lat. 21° 45' 10.48", E. Long. 96° 16' 33.77".

Frequency – Semi-annually (have to hire technicians for analysis).

Also monitor effectiveness of mitigation measures taken.

Budget and responsibilities

Budget: Ks 100,000 (once off cost)

Responsibilities: hired technicians and EMP cell members.

5. Air quality

Objectives

- To prevent air pollution due to construction activities.
- To mitigate/reduce air emission and control air quality as practical as possible.
- To create a healthy environment for all in the area.

Legal requirement

- Comply with NEQEG guideline 2015; Code No.1.1, 2.3.6.1

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase.

Management action

- Comply with ECD's NEQEG emission guidelines.
- Plan in the Pre-Construction Phase for the procurement of equipment, vehicles that emit less smoke (to be certified for emission compliance) and procured them.
- Test/monitor air quality regularly.
- Keep equipment and vehicles well-maintained, well-operated and well-lubricated to reduce smoke emission.
- Used machinery and vehicle with low emission rate; use fuel with low sulphur content.
- Avoid open burning of debris.
- Spray water for suppression of dust.
- Restrict vehicular movement; maintain road clear of mud and dirt.
- Limit open stockpile of earth, sand etc.
- Stop loading/unloading of earth, sand for a moment while strong wind is blowing.
- Provide PPE to workers who are exposed to smoke or dust for long period.

Monitoring plan

Parameters to be monitored: NO₂, SO₂, PM₁₀, PM_{2.5}, O₃ for air quality;

Monitoring point –

- At construction site, (project site) : N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0".
- At Nat Yay Kan village : N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5"
- At Kandwin village : N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"

Frequency – Semi-annually (have to hire technicians).

Visual inspection of ambient air condition: weekly,

Also monitor effectiveness of mitigation measures taken.

Budget and responsibilities

Budget: Ks 5,100,000 (once off cost).

Responsibilities: hired technicians and EMP cell members.

6. Odour

Note – No bad odour is generated during Construction Phase.

7. Chemicals

Note – No chemicals are used during the Construction Phase.

8. Water quality

Objectives

- To prevent pollution of surface water (ground water cannot be detected and sourced).
- To control/manage water quality and quantity.
- Not to cause any negative impact on water resources of the local community.

Legal requirement

- Comply with National Drinking Water Quality Standard, 2019.

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase.

Management action

- Avoid water bodies as far as possible when constructing or building roads
- Test/monitor water quality regularly

- Storage of fuel oil as well as used fuel oil should be done in a designated banded side until removal
- Maintain vehicles and machinery adequately to prevent spillages resulting in surface water contamination
- When handling fuel oil avoid accidental spillages into the surface water; should spillages occur implement appropriate clean up immediately.
- Avoid disposing of waste (both liquid and solid) into water bodies.
- Top soil should be allowed to naturally vegetate in order to stabilize soil particles and thus preventing erosion and limiting siltation to avoid pollution of water by all means.

Monitoring Plan

Parameter to be monitored: Total coliforms, Fecal coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron, P^H, Sulphate, Total Dissolved Solids

Monitoring Point

- Myitnge River, coordinates: N. Lat. 21° 46' 38.3"; E. Long. 96° 16' 30.3"
- Nat Yay Kan village, coordinates: N. Lat. 21° 44' 35.9"; E. Long. 96° 14' 52.0"
- Kandwin village, coordinates: N. Lat. 21° 46' 53.1"; E. Long. 96° 14' 15.0"

Frequency: Semi-annually (have to hire technicians)

Visual inspection of water condition: weekly

Also monitor effectiveness of mitigation measures taken.

Budget and responsibilities

Budget: Ks 600,000 (once off cost)

Responsibilities: hired technicians and EMP cell members.

9. Erosion and sedimentation

Objectives:

- To avoid, prevent, manage and mitigate potential soil erosion and sedimentation.
- To maintain natural ecology as far as possible.

Legal requirement

- Comply with Environmental Conservation Law (2012) and Environmental Conservation Rules (2014); not to cause destruction of soil structures and profile, and conservation of soil ecology.

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase (in retrospect).

Management action

- Implement erosion control/management when the natural slope is more than 20°.
- Minimize length and steepness of slope (conduct land cutting, land filling and land construction).
- Minimize the area of bare soil exposed as practical as possible (do not clear the vegetation more than necessary leaving large area of bare land).
- Run-off from areas adjacent to the site will be diverted around disturbed areas (construction of small diversion canal/drainage).
- Control sediment (build sediment trap or dam where necessary).
- Prevent sliding and erosion of soil stockpile as far as possible: let grass and vegetation grow on stockpile for stabilization.
- Ensure that the slope of a stockpile is not more than 37°.
- Ensure that run-off from the site is discharged at non-erosive velocities; discharge will be to location that do not adversely impact the natural waterways (river).

Monitoring plan

- Regular visual inspection of ground and soil condition only.

Monitoring point:

- Inside the project site, coordinates: N. Lat. 21° 45' 0.74", E. Long. 96° 16' 28.47".

Frequency: Weekly during rainy season and monthly during dry season.

Also monitor the effectiveness of mitigation measures taken.

Budget and responsibilities

Budget: Free of charge (All EMP cell leader and EMP cell members are well-paid employees of the factory; no extra fees for them; no EMP contractor exist in Myanmar yet for hire).

Responsible

EMP cell leader and EMP cell members.

10. Biodiversity

Objectives

- To protect and conserve the biodiversity of the area as far as possible.

Legal requirement

- Comply with Conservation of Biodiversity and Protected Areas Law, 2018; not to impact or destroy natural habitat and biological ecosystem.

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phas.

Management action

- Do not clear vegetation more than necessary for the construction of access road and site.
- Prevent the spillages of hydrocarbons which has negative impact on plants especially on the root system
- Restrict the collection of fire wood.
- Fire for cooking should only be made in dedicated spot cleared from vegetation.
- Avoid open burning of debris.
- Educate workers for fire awareness and protection.
- Identify sensitive species and habitats and try to avoid such spots as far as possible.
- Promote environment awareness to workers.
- Try to stop illegal logging; inform the authority if there is any.
- Implement rehabilitation to promote natural vegetation establishment after completion of construction works and also around the site.
- Ensure that construction works have minimal disturbance on wildlife.
- Restrict vehicular movement to the access road to prevent habitat disturbance of birds and animals.
- Prohibit the hunting and/or trapping of wild animals.
- Prevent the potential injury or death of wildlife due to vehicular movements especially during nigh time.
- Avoid the use of excessive bright light for long hours at night to prevent the aggregation and eventual death of large number of insects (offensive bright light in the forest at night will also scare away wild animals from their natural foraging or breeding ground).

Monitoring plan

- Monitor the situation of flora and fauna in the surrounding area (both natural and artificial flora and fauna).

Monitoring point

The whole surrounding area where flora and fauna exist.

Frequency: quarterly (during dry, wet, cool season).

Also monitor effectiveness of mitigation measures taken.

Budget and responsibilities

Budget: Free of charge (All EMP cell leader and EMP cell members are well-paid employees of the factory; no extra fees for them; no EMP contractor exist in Myanmar yet for hire).

Responsible

EMP cell leader and EMP cell members.

11. Occupational Health and Safety (OHS)

Objectives

- To prevent workers from any occupational health risks and accidents;
- To create a safety working atmosphere for workers.
- To provide free Medicare for all workers.

Legal requirement

- comply with Occupational Health and Safety Law, 2019; Prevention and Control of Communicable Diseases Law, 1995;
- To ensure for a healthy and productive workforce for successful implementation of the project.

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase.

Management action

- Creation of a safe working place and working condition.
- Facilities will have adequate space for all kinds of activities, e.g. excavation, transportation, crushing, site for stockpiles, etc.

- Provision of adequate lavatory facility, bath and washing area; provision of adequate potable drinking; provision of health living spaces and clear eating areas, provision of first aid at all times for workers (the company has its own clinic).
- For practical purpose provide First Aid Training for some workers with the assistance of Township Red Cross society; will provide adequate first aid facility including first aid kits, medicines and drugs.
- Provide training for Occupational Health and Safety; training for good safety practice, for personal safety (preventing accidents, injuries), basic hazards awareness, and site specific hazards, (especially at mining sites).
- Provide training on safety handling and operation of machinery equipment, safety storage and handling of fuel oils.
- Will provide adequate PPEs to workers where and when necessary to ensure the basic health protection and safety of workers.
- Provide safe work procedure for all electrical works.
- Avoid/prevent premature explosion or any undesirable explosions by all means (strictly follow the rules and procedures).
- Educate and train drivers, particularly heavy truck drivers for safety driving and defensive driving; ensure that the access road is not bumpy and safe for driving.
- Try to achieve zero accidents in excavation, hauling and transportation activities including traffic.
- Ensure that workers are not subject to excessive repetitive motions, over exertion and excessive manual handling; if possible will use mechanical labour rather than manual labour as practical as possible to reduce fatigue, strain and injury on workers.

Monitoring plan

- Regular monitoring and inspection of all work places and working condition during the Construction Phase.
- Regular inspection of factory's clinic; monitor log book of clinic and look for records of accidents, injuries, sickness; number of patient treated at clinic and admitted to township hospital.
- Monitor/inspect medicines and drugs kept at the clinic store, First Aid Kits and other; replenishment of medicines and drugs.

Parameter to be monitored: working condition, especially at factory construction and development site.

Monitoring point : project site, Coordinate: N. Lat. 21°45'17.60"; E. Long. 96°16'29.79".

Frequency : daily and weekly.

Also monitor effectiveness of mitigation measures taken.

Budget and responsibilities

Budget: Ks 1,500,000 cost of provision of medicines and drugs and First Aid facility for the Construction Phase. (This is from the allotted EMP fund where 10% of the fund under emergency programme).

Responsibilities

Two employees that have First Aid training and EMP cell member (two permanent nurses will be employed at the start of the Operation Phase).

12. Community Health and Safety

Objectives

- To ensure that the construction activities do not have any adverse effect on the health and safety as well as social well-being of the local people.

Legal requirement

- Comply with Myanmar Public Health Law, 1972; and Prevention and Control of Communicable Diseases Law, 1995, the Environmental Conservation Law, 2012, and the Environmental Conservation Rules, 2014.

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase.

Management action

- Control smoke and dust as practical as possible;
- Avoid open burning of debris and trash so that smoke will not reach the village; educate the driver to lower speed when passing through the village (the reduction of speed from 40 km to 35 km can reduce dust to 50%, it is learnt).

- Ensure that noise from construction activities do not cause any undesirable impact on the social and health of the local people.
- Local should be able to file complaints regarding dust, noise and vibration.
- Ensure that the water ponds do not become breeding ground for mosquitoes; regularly changing of water; application of mild chlorination; annihilation of mosquito larvae by all means; educate workers to use mosquito's nets at night and provision of mosquito nets.
- Also ensure that domestic solid wastes, liquid waste water and drainage do not become breeding ground for flies, mosquitoes and insect for prevention of vector borne diseases and water borne or water related disease.
- Prevent the occurrence and spread of infectious and communicable diseases by all means; undertake health awareness and educations initiative (health education campaign) in local community as far as possible.
- Avoid/minimize by all means, vector borne, water borne (water based, water related) disease and communicable diseases that would result from project activities. Liaise with Township Health Authority regularly.
- Avoid/minimize by all mean spread of diseases from workers. Educate long distance truck driver regarding sex education; example for use of prophylactic condom; prevent spread of STD, HIV/AIDS.
- Educate workers regarding code of conducts, social conducts, etiquette and local culture and tradition.
- Educate drivers for safe driving and defensive driving and to comply with rules and regulation regarding traffic; also conduct road safety education campaign for the local community, if possible; local should be able to file complaint regarding traffic.
- Comply with law and regulation relevant to transportation of hazardous materials such as fuel oils; also plan for measures for preventing and/or mitigation the consequence of accidental release/spill of hazardous materials (fuel oil); avoid/minimize community exposure to hazardous materials.
- Develop emergency preparedness and emergency response plan and contingency plan (action plan) for effective implementation when necessary; provide operation manuals for external emergency plan and internal emergency plan for all workers. Conduct rehearsals or drills for such plan. Cooperation with local community and authority in preparation of emergency plan.

Monitoring plan

- Monitor the overall health condition of the local people of the 2 nearby village during the Construction Phase.
- Occasional inquiry of the health issue at two nearby villages, namely, Nat Yay Kan and Kandwin; providing health education, giving health education lectures.

Parameter to be monitored: overall health situation of the locals.

Frequency: at least once during the Construction Phase.

Budget and responsibilities

Budget: Ks 1,000,000 – cost for fees or courtesy gifts to the Township Health Department personnel, who will be required to give health education speeches and lectures (the expense will be from the allotted EMP fund).

Responsibilities

EMP cell members and personnel from Township Health Departed (who will be requested to provide assistance in execution of Community Health and Safety programme.

13. Cultural heritage

Objectives

- Not to have any adverse impact on the cultural/religious heritage (monasteries, pagodas and churches) in the area due to construction activities.

Legal requirement

- Comply with "The Protection and Preservation of Cultural Heritage Law", 2019; "the Protection and Preservation of Ancient Monument Law 2015"; protect the religious components of the surrounding area.

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase.

Management action

- Ensure that the construction activities have no negative impact on the village monastery and pagoda.
- Also ensure that there are also no negative impacts on the village Buddhist monastery and pagoda.

- Pay obeisance visit occasionally to the abbot monks, offer cash and kind.
- Also pay courtesy visit to the pastors and offer cash and kind.
- Provide donation and charity to monasteries and churches during religious festival days.

Monitoring plan

Monitoring site : the said two Buddhist monasteries and two churches.

Frequency : occasionally, especially during religious festival days.

Budget and responsibilities

Budget: Ks 2,500,000 (appropriate Ks 2,500,000 per year for donations and charities for the above monasteries and churches). The money is from CSR programme fund, not EMP fund.

Responsibilities – The factory manager and EMP cell members.

14. Employment and Training

Objectives

- To prioritize employment of the locals as practical as possible; to organize induction training and long term professional training.

Legal requirement

- Comply with Employment and Skill Development Law, 2013.

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase.

Management action

- Plan for human resource development.
- Prioritize employing locals as far as possible.
- Organize new task employees for job training.
- Also provide systematic induction training for new workers to enable them to do their jobs efficiently.

- Induction training will cover: general training; skill training for efficiency and mandatory training relating to health and safety (e.g. safety operation of machinery and handling of hazardous materials).
- Educate and train them for good working practice, good safety practice, good health and hygiene practice and good environmental awareness practice until all these practices are ingrained in their mind sets and become good habits.
- Educate and train them for familiarization with negative impacts and subsequent taking of mitigation measures.
- Educate and train them for basic eco-friendly behaviours e.g. good house-keeping practice, do not litter, do not dirty your place, minimize the use of water, fuel.

Monitoring plan

Monitoring sites: all work places (inspect/monitor training programme; training in process; training course; work efficiency of workers).

Also monitor effectiveness of training programme.

Frequency: from time to time; or monthly, or every training session.

Budget and responsibilities

- Free of charge (the company's senior staff members, senior technician and experienced staff will educate train and supervise new workers).
- However, appropriate Ks 2,000,000 as fees and courtesy gifts for trainers and educators from relevant governmental departments.

Responsibilities

- The factory managers, seniors staffs and EMP cell members.

15. Emergency response

Objectives

- To maintain emergency preparedness and response to any emergency in a systematic and effective way.
- To execute emergency response plan, emergency procedure plan, rescue operation plan, contingency plan and aftermath plan, all in a systematic manner.

Legal requirement

- Comply with Fire Brigade Law, 2015; Factories Act 1951 (Amended 2016), and Occupational Health and Safety Law, 2019.

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase.

Management action

- Prepare Emergency Response Plan (ERP) and team to prevent fatalities and injuries, to reduce damage and to protect environment and community execute the plan.
- Prepare emergency preparedness plan and execute the plan.
- (Emergency Response Plan will cover emergency resources, emergency preparedness and training, emergency response procedures, administration of the plan, communication and procedures, and debriefing and post-traumatic stress procedures.)
- For practical purpose provide training for fire fighting, training for First Aid and Rescue.
- Provide facilities (e.g. fire fighting equipment, suit, first aid kits, and emergency vehicle.
- Display phone numbers of Fire fighting Department, Ambulance Services, Red Cross Society, Hospital and Police Station.

Monitoring plan

- Monitor fire fighting training activities during training session.
- Monitor First Aid training activities during training session.
- Monitor rehearsal or mock drill session for emergency response.
- Monitor construction activities on a weekly basis.
- Inspect the construction site for emergency preparedness.

Frequency : monitor activities during all training sessions.

: monitor construction activities at least once a week.

Budget and responsibilities

Ks 5,000,000 set aside for execution of emergency response plan. In case of major accident like major fire budget for emergency will be used mainly for compensation for injured, sicked and dead employees; and will use for rehabilitation of injured and disabled employees.

No other fees or charges as this emergency response plan will be executed by EMP cell members who are all well-paid employees.

Responsibilities

EMP cell leader, EMP cell members and staff trained for emergency response.

16. Traffic safety

Objectives

- To ensure for traffic safety in the area, particularly along the 10 miles access road constructed by the company.
- To avoid/prevent traffic congestion along the access road and particularly at the intersection of the access road and the high way.
- To aim for zero road/traffic accident.

Legal requirement

- Comply with "Vehicle Safety and Motor Vehicle Management Law," 2020; the High Way Law, 2000; and all regulation regarding road traffic.

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase.

Management action

- Ensure that the construction of the access road (hard top road) by the company is up to standards (a two lanes road).
- Traffic is light (used only by vehicles of the company and local motorcyclists) but safety plan is necessary.
- Set up warning signage and speed limits at appropriate spots.
- Educate and train company's drivers for compliance with road and traffic regulation.
- Educate heavy trucks drivers for slow driving and defensive driving.
- Do not over load the trucks.
- Cover truck haulages (building materials) with tarpaulin.
- Try to achieve zero road accidents.
- Keep a log book for each vehicle.
- Ensure that driver is not over-worked, set up rotating system for drivers.

Monitoring plan

- Inspect the condition of the vehicles fortnightly
- Monitor traffic on the access road on a fortnightly basis.
- Monitor the daily arrival and departure of vehicles at the construction site.
- Monitor the log book for each vehicle on a weekly basis.

Monitoring point : at one point on the access road and outside the site.

Frequency : daily, weekly, fortnightly as mentioned above.

Budget and responsibilities

Free of charge. The EMP cell members who are well-paid employees will do the work free of charge.

The costs for vehicles repairs or maintenance will be borne by the main budget, not from the EMP fund.

Responsibilities : EMP cell leader and cell members.

17. Aesthetics, potential visual issue

Objectives

- To ensure that the result of the construction works will not have any lasting visual/aesthetic issue.
- To ensure that the buildings and structures constructed are not in prominent contrast with the surrounding but in harmony with the environment as far as possible.
- To avoid/prevent sight pollution/visual pollution.

Legal requirement

- Comply with Environmental Conservation Law, 2012 and Environmental Conservation Rules, 2014; not to destroy the environment; preserve the natural beauty of the area as practical as possible.

Overview maps, layout maps, images, aerial photos, satellite images

- There are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub plan will be implemented during the Construction Phase.

Management action

- Plan and manage for construction of the factory complex and all buildings and structures that focus on aesthetics appeal.
- Systematic plan for orientation of all buildings and structure (not in awkwardly and unkempt fashion)
- The size and shape of buildings and structures should be of size and shape acceptable to the eyes (not unsightly buildings and structures).
- Use paints with colours that are pleasant for the eye sight; (not bright colours e.g. brilliant red and yellow that are not pleasant for the eye sight).
- Avoid using deflective roofing's that are offensive to the eyes during sunlight hours; paint the roofs with green or blue colour.
- Try to keep the buildings and structures in harmony with the surrounding (not to stand out prominently in contract with the surrounding).
- Plan for creation of green lawns.
- Plan for planting of fast growing trees.
- Clear and tidy up the site after Construction Phase (do not leave construction waste, tailing and debris which are unsightly).

Monitoring plan

- Monitor construction work weekly
- Conduct daily monitoring when the building and structures are near completion to ensure that they are according to shape and form as planned.
- Conduct daily monitoring on the finishing works and painting work to ensure that suitable paint colour are applied.
- Monitor the installation of lighting facilities (lamps, bulbs) to ensure that proper lighting is achieved; and ensure that lighting at night is not excessive and offensive to the eyes.
- Monitor the installation of roofing of green or blue colour (not reflective roofing) to ensure not light reflection which is not offensive to the eyes.

Budget and responsibilities

Free of charge. EMP cell leader and EMP cell members, who are well-paid staffs, will undertake the management and monitoring works.

Responsibilities – EMP cell leader and EMP cell members.

8.6.2 During the Operation Phase

These are summarized as follow:

1. Noise and vibration

Objectives:

- To mitigate/reduce noise and vibration levels; to create a safety work place; not to cause nuisance to the local.

Legal requirement:

- Comply with NEQEG (emission) guideline, 2015; Code No.1.3.

Overview maps, layout map, images, aerial photo, satellite image

These are shown below.

Implementation schedule:

The sub-plans will be implemented during the Operation Phase.

Management action

- Procure eco-friendly machinery that emits low noise level in the first place.
- Restrict vehicular movement to reduce noise and vibration.
- Implement mitigation measures for impact/potential impact.
- Keep machinery and vehicles well-maintained and well-lubricated to reduce noise level.
- Develop green belt as noise pollution sink (abate noise).
- Ensure that foundations for machinery are stable to reduce vibration.
- Create smooth road surface to mitigation vibration by trucks movements.
- Provide PPE, ear muffs, where necessary.
- Conduct daily inspection of noise condition.
- Implement GRM, so that locals can file complaints regarding noise and vibration.
- Regularly monitor effectiveness of mitigation measures taken.

Monitoring plan

Parameter to be monitor : dBA during day and night time

Monitoring points

For noise

- Inside the factory : N. Lat. 21°45'17.60"; E. Long. 96°16'29.79".
- At Nat Yay Kan village : N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5".
- At Kandwin village : N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"

For vibration

- Inside the factory : N. Lat. 21° 44' 46.2"; E. Long. 96° 16' 39.0"
- At Nat Yay Kan village : N. Lat. 21° 44' 33.9"; E. Long. 96° 15' 01.7"
- At Kandwin village : N. Lat. 21° 46' 52.7"; E. Long. 96° 14' 14.7"

Frequency – Semi-annually (have to hire technicians)

Also monitor effectiveness of mitigation measures taken.

Budget and responsibilities

Ks 900,000 (once off cost)

Responsibilities – hired technicians and EMP cell members.



LEGEND

 Noise level

 Vibration

Figure – 58: Satellite image showing points of management and monitoring sub-plan for noise and vibration

2. Waste

Objectives:

- To mitigate/reduce industrial and domestic wastes; not to pollute the environment; to create a healthy environment.

Legal requirement

- Comply with Environmental Conservation Law, 2012 (Section 14, 15, 31) and Environmental Conservation Rules, 2014 (Rule 69) (to discharge wastes in accord with environmentally sound method).

Overview maps, layout map, images, aerial photo, satellite image

- These are shown below.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Educate and train workers for the proper handling of wastes; educate them for good housekeeping and minimization of waste as practical as possible.
- Separate wastes into recyclable and non-recyclable ones; dispose only those that are non-recyclable.
- Landfill wastes that cannot be recycled or reused.
- Avoid dumping of waste on ground and into the river.
- Avoid open burning of solid wastes.
- Monitor waste management monthly.
- Monitor effectiveness of mitigation measures taken.
- Implement GRM (locals can file complaint regarding solid wastes).

Monitoring plan

- Monitor (visual inspection) of waste regularly
- Monitor landfill
- Monitor record book or log book of solid wastes (industrial and domestic) generated weekly or monthly; quantity and mode of collection; tackle issue, if any promptly.

Monitoring point

- Monitor log book and at the company's landfill, coordinates: N. Lat. 21°45'23.29"; E. Long. 96°16'18.18"

Frequency – weekly, monthly.

Also monitor effectiveness of mitigation measures taken.

Budget and responsibilities

Free of charge (all EMP cell leader and members are well-paid employees of the factory no extra fees for them; no EMP contractor exist in Myanmar yet, for hire).

Responsibilities – EMP cell leader and EMP cell members.



LEGEND

 Waste

Figure – 59: Satellite image showing point of management and monitoring sub-plan for waste

3. Hazardous waste

Objectives

- To control, and manage hazardous wastes, if any, to operate an ecofriendly business.

Legal requirement

- Comply with Environmental Conservation Law, 2012 and Environmental Conservation Rules, 2014.

Overview maps, layout map, images, aerial photo, satellite image

- These are shown below.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

Used fuel oils, engine oil, used filter bags, old lamps and batteries are considered hazardous.

- Collect used oil and engine oil in old drums and give away to recyclers.
- Discard used filters, old lamps; old batteries at the approved land fill of the company.

Monitoring plan

- Monitor the storage, handling and uses of fuel oils, inspect fuel depot regularly.
- Monitor the collection of used fuel oil engine oil in old drums and give away to recyclers.
- Monitor the collection of used filter bags, old lamps, batteries and their disposal at landfill.

Monitoring points

- At fuel depot, coordinate: N. Lat. 21°45'5.44"; E. Long. 96°16'35.61"
- Waste bins and landfill: N. Lat. 21°45'23.29"; E. Long. 96°16'18.18"

Frequency – weekly, monthly.

Also monitor effectiveness of mitigation measures taken.

Budget and responsibilities

Free of charge (all EMP cell leader and members are well-paid employees of the factory no extra fees for them; no EMP contractor exist in Myanmar yet, for hire).

Responsibilities – EMP cell leader and EMP cell members.



LEGEND

 **Hazardous Waste**

Figure – 60: Satellite image showing points of management and monitoring sub-plan for hazardous waste

4. Waste water and storm water

Objectives

- To control, manage and mitigation waste water and storm water; to create a healthy environment.

Legal requirement

- Comply with NEQEG guideline (2015); Code No.2.3.6.1.

Overview maps, layout map, images, aerial photo, satellite image

- These are shown below.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Educate and train workers in the handling, treatment and recirculation of waste water.
- Industrial/production waste water will be recirculated.
- Set up drainage system for domestic waste water and storm water.
- Domestic waste water (used water) from office, dormitory, kitchen, baths etc. will end up in waste water pond and dry up (no special treatment requirement).
- Domestic waste water (black water) from toilets will end up in septic tanks and soak pits.
- Avoid disposing of liquid waste into open ground by all means.
- Monitor waste water every six months (hire technicians).
- Conduct weekly visual inspection of waste water condition.
- Monitor effectiveness of mitigation measures taken, monthly.

Monitoring plan

Parameters to be monitored: pH, temperature increase, total suspended solids (compare with guideline values)

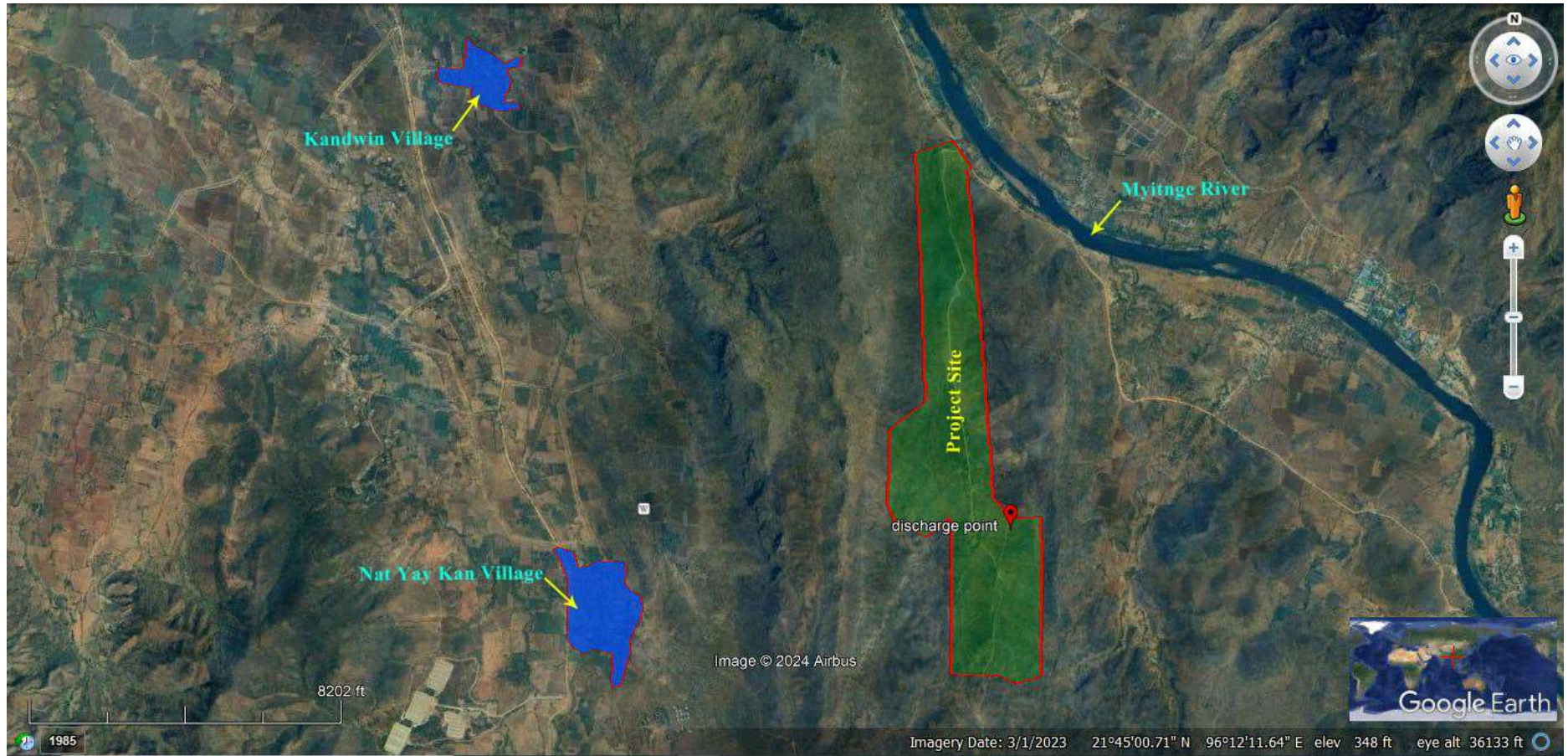
Monitoring points : at point discharge, coordinate: N. Lat.21°44'56.73"; E. Long. 96°16'42.43".

Frequency : Semi-annually (have to hire technicians).

Also monitor effectiveness of mitigation measures taken.

Budget and responsibilities: Ks 100,000 (once off cost).

Responsibilities : Hired technicians and EMP cell members.



LEGEND

 Waste water and storm water

Figure – 61: Satellite image showing points of management and monitoring sub-plan for waste water and storm water

5. Air quality

Objectives

- To prevent pollution of air environment
- To mitigate/reduce air emission and air pollution and control air quality as practical as possible; to create a healthy environment for all in the area.

Legal requirement

- Comply with NEQEG (emission) guideline (2015); Code No.1.1, 2.3.6.1, prescribed by ECD.

Overview maps, layout map, images, aerial photo, satellite image

- These are shown below.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Implement "closed equipment and closed storage design" in the first place to mitigate dust.
- Install bag filters (58 Nos.).
- Ensure complete combustion of coal.
- Avoid open burning of any trash, debris.
- Keep equipment, vehicles well-operated, well-maintained and well-lubricated to reduce smoke.
- Spray water for suppression of dust.
- Provide PPE, face mask where necessary.
- Plant fast growing trees to sequestrate CO₂ and trap dust.
- Conduct regular monitoring; hire technicians.
- Daily overall inspection of smoke and dust.
- Implement GRM so that locals can file complaint about smoke and dust.

Monitoring plan

- Parameters to be monitored: for air quality, NO₂, SO₂, PM₁₀, PM_{2.5}, O₃; for emission, cadmium, thallium, total organic compound (compare with NEQEG guideline).

Monitoring point

- At project site : N. Lat. 21° 44' 44.9"; E. Long. 96° 16' 40.0".
- At Nat Yay Kan village : N. Lat. 21° 44' 36.4"; E. Long. 96° 14' 57.5"
- At Kandwin village : N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 15.0"

Frequency – Semi-annually (have to hire technicians)

Visual inspection of condition: weekly

Also monitor effectiveness of mitigation measures taken.

Budget and responsibilities

Budget: Ks 5,100,000 (once off cost).

Responsibilities – hired technicians and EMP cell members.



LEGEND

 Air quality

Figure – 62: Satellite image showing points of management and monitoring sub-plan for air quality

6. Odour

Note: Odour is not an issue; no bad odour is generated. Odour, if any, cannot be measured yet. Theoretically odorant unit should be within 10.

7. Chemicals

Objectives

- To manage the storage, handling and uses of chemicals in an eco-friendly way, to avoid or prevent any chemical hazards.

Legal requirement

- Comply with Prevention of Hazards from Chemical Substances Law, 2013; abide strictly to safety transportation, storage, handling and uses of chemicals, safety equipment and PPE, uses of MSDS and Pictogram.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Manage for safety transportation and storage of chemical.
- Keep a separate chemical store (concrete floor, brick walling, iron roofing; structural integrity suitable as chemical store).
- Kept all bottles, containers, vases on shelves.
- Kept MSDS for some e.g. sulphuric acid, nitric acid, hydrochloric acid, acetic acid etc. provide pictogram.
- Manage for safety handling and uses of chemical.
- Deploy experienced lab technicians.
- Ensure the quality testing laboratory is of standards.
- Used chemical bottles and containers to be regularly disposed at the landfill.

Monitoring plan

- Monitor the chemical store monthly; ensure that both and containers are kept systematically; (MSDS sheets, pictogram).
- Monitor the factory quality control laboratory and activities taking place inside the laboratory; ensure that lab technicians are performing a good working practice and good safety practice.

Frequency – weekly/monthly.

Also monitor effectiveness of mitigation/corrective measures taken.

Budget and responsibilities

No separate budget for procuring chemicals for EMP purpose; all are borne by the main budget; no technicians have to be hired; all lab technicians are well-paid staff of the factory.

Responsibilities – EMP cell members and lab technicians.

8. Water quality

Objectives

- To prevent pollution of surface water (ground water cannot be detected and sourced).
- To control/manage water quality and quantity; not to pollute the water environment.
- Not to causes any negative impact on water resources of the local community.

Legal requirement

- Comply with National Drinking Water Quality Standard, 2019.

Overview maps, layout map, images, aerial photo, satellite image

- These are shown below.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Ensure no wastes (solid, liquid) are disposed/discharged into the Myitnge River.
- Apply recirculation water (cooling ponds) system.
- Create systematic drainage system in the first place.

- Wash equipment and vehicle in designated areas.
- Avoid disposal of any waste into stream and weir.
- Avoid accidental spills of fuel oil into the stream and weir by all means. (also avoid spills on ground; should spill occur do not wash down with water but use absorbents).
- Set up fuel drip trays and bund fuel depot to protect soil, and hence water.
- Maintain machinery and vehicles to prevent spills or leaks.
- Manage water conservation; reduce water consumption, educate workers for this.
- Test water quality semi-annually (hire technicians).
- Conduct weekly visual inspection of water condition.

Monitoring plan

Parameters to be monitored: Total coliforms, Fecal coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron, P^H, Sulphate, Total Dissolved Solids

Monitoring points:

- Myitnge River, coordinates: N. Lat. 21° 46' 38.3"; E. Long. 96° 16' 30.3"
- Nat Yay Kan village, coordinates: N. Lat. 21° 44' 35.9"; E. Long. 96° 14' 52.0"
- Kandwin village, coordinates: N. Lat. 21° 46' 53.1"; E. Long. 96° 14' 15.0"

Frequency – Semi-annually (have to hire technicians)

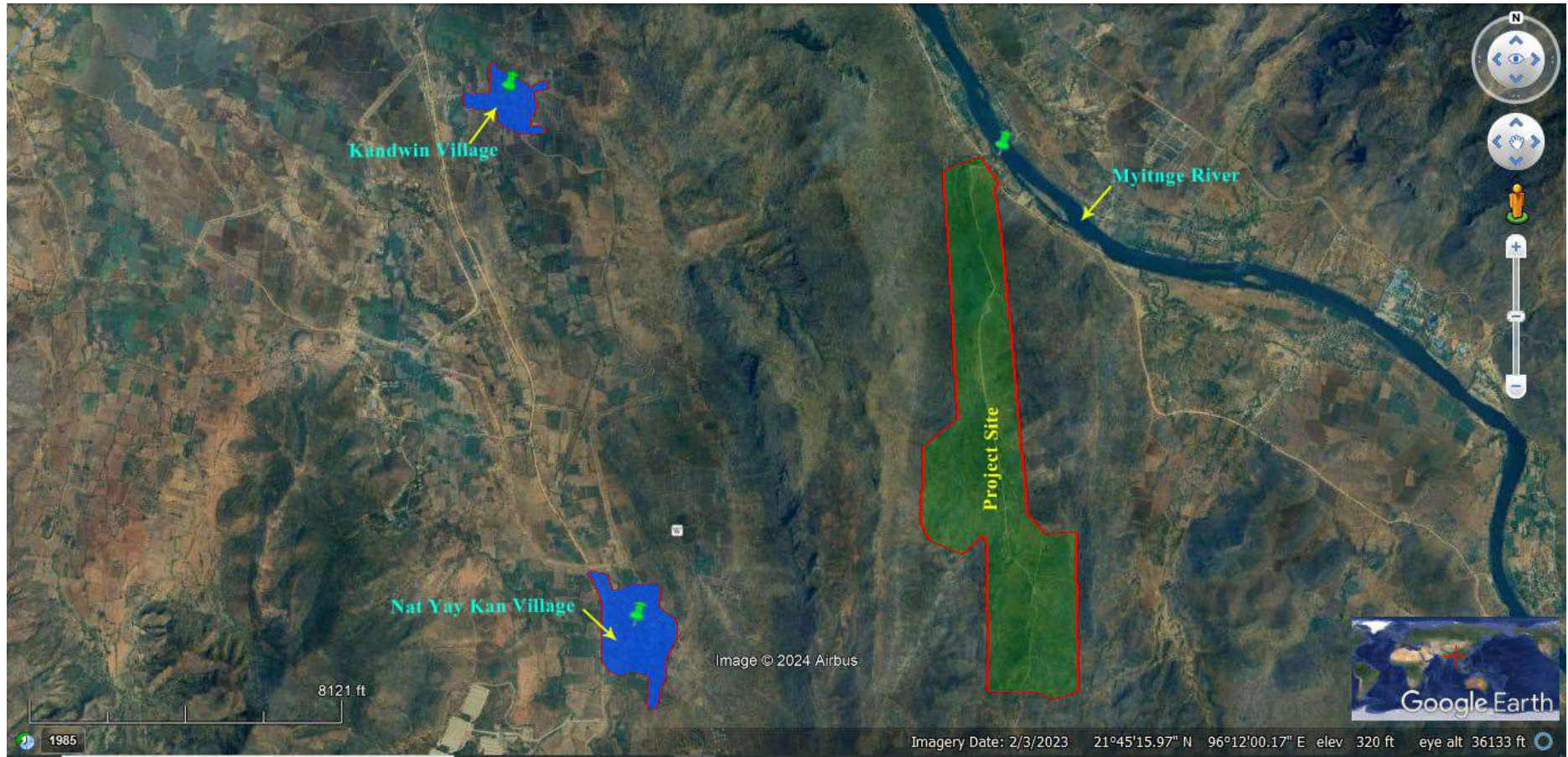
Visual inspection of water condition: weekly.

Also monitor effectiveness of mitigation measures taken.

Budget and Responsibilities

Budget: Ks 600,000 (once off cost)

Responsibilities: hired technicians and EMP cell members.



LEGEND

 Water quality

Figure – 63: Satellite image showing points of management and monitoring sub-plan for water quality

9. Erosion and sedimentation

Objective:

- To avoid, prevent, manage and mitigate potential erosion and sedimentation;
- To maintain natural ecology as far as possible.

Legal requirement

- Comply with the Environmental Conservation Law, (2012) and Environmental Conservation Rules, (2014); not to cause destruction of soil structure and profile, and conservation of soil ecology.

Overview maps, layout map, images, aerial photo, satellite image

- These are shown below.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Implement erosion control/management when the natural slope is more than 20° (actually not necessary).
- Ensure that activities do not impact soil structure.
- Minimize the area of bare soil exposed as practical as possible (do not clear the vegetation more than necessary leaving large area of bare land).
- Create sound drainage system; the factory compound has a network of drainage.
- Run-off from areas adjacent to the site will be diverted (construction of small diversion canal/drainage).
- Control sediment if necessary, inside the compound.
- Ensure that run-off from the site is discharged at non-erosive velocities; discharge will be to location that do not adversely impact the natural flow of the stream.
- Ensure that the soil profile of the site is stable and not easily eroded.
- Regularly monitor erosion (rainy season).

Monitoring plan

- Regular visual inspection of ground and soil condition only.

Monitoring point:

- Inside the factory premise, coordinate: N. Lat. 21° 45' 0.74", E. Long. 96° 16' 28.47"

Frequency – weekly during raining season (wet months); monthly during dry months.

Also monitored effectiveness of mitigation measures taken.

Budget and responsibilities

Free of charge (all EMP cell leader and members are well-paid employees of the factory no extra fees for them; no EMP contractor exist in Myanmar yet, for hire).

Responsibilities – EMP cell leader and EMP cell members.



LEGEND

 Erosion and sedimentation

Figure – 64: Satellite image showing points of management and monitoring sub-plan for erosion and sedimentation

10. Biodiversity

Objectives

- To protect and conserve the biodiversity of the area as far as possible.

Legal requirement

- Comply with the Conservation of Diversity and Protected Areas Law, 2018; not to impact or destroy natural habitats and biological ecosystem.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Plan for minimum disturbance to the flora and fauna.
- Do not clear vegetation more than necessary.
- Restrict the collection of fire wood.
- Avoid open burning of debris.
- Educate workers for fire awareness and protection; get rid of all debris that can cause fire.
- Identify sensitive species and habitats, if any, and try to avoid such spots as far as possible.
- Implement rehabilitation to promote natural vegetation establishment after Construction Phase.
- Restrict vehicular movement to the access road to prevent habitat disturbance of birds and animals.
- Prevent the potential injury or death of small wildlife due to vehicular movements especially during night time.
- Avoid the use of excessive bright light for long hours at night to prevent the aggregation and eventual death of large number of insects.
- Identify sensitive species which need to be avoided; if any, avoid the disturbance of animal habitat such as nest and breeding ground.
- Plant trees, create green belt; establish a plant nursery near the end of the Operation Phase for major rehabilitation of the site.

Monitoring plan

- Monitor the situation of flora and fauna in the surrounding area (both natural and artificial flora and fauna).
- Monitor the reforestation activities.

Monitoring point – the whole surrounding area where flora, fauna exist.

Frequency – quarterly (during dry season, wet season, cool season).

Also monitor effectiveness of mitigation taken for biodiversity.

Budget and responsibilities

Free of charge (all EMP cell leader and members are well-paid employees of the factory no extra fees for them; no EMP contractor exist in Myanmar yet, for hire).

Responsibilities – EMP cell leader and EMP cell members.

11. Occupational Health and Safety

Objectives

- To prevent workers from any occupational health risks and accidents; to create a safety working atmosphere for workers,
- To provide free health cares for workers.

Legal requirement

- Comply with Occupational Health and Safety Law, 2019; Prevention and Control of Community Disease Law, 1995; to ensure for a healthy and productive workforce for successful implementation of the project.

Overview maps, layout map, images, aerial photo, satellite image

- These are shown below.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Plan and manage for creation of a safe working environment, (safe working place and working condition for all staff.
- Provide adequate portable drinking water, lavatory facilities
- Provide healthy living space (housing) and clean eating areas.
- Provide sufficient natural light or artificial illumination and good ventilation system.

- Create emergency exist, where necessary.
- Workers are providing with PPE, where necessary.
- Set up a factory clinic; conduct annual medical check-up for all.
- Emergency and logistics plan for sick and injured staffs; treatment at clinic; admission to nearest hospital.

Training

- Induction training (new task employee training) for workers covering: knowledge of materials, equipment, tools; known hazards in the operation and control; potential to risk and precaution; hygiene requirement; wearing of PPEs; appropriate/emergency response to accident, to natural disaster.
- Education and training for safety handling and operation of machinery, equipment; safety storage, handling and uses of chemical, fuels, explosives, etc.
- Provide OHS training for all staff; educate and train them for good working practice, good safety practice, good housekeeping practice, good health and hygiene practice.
- Provide fire fighting training and First Aid training.

Physical hazards

- Design all machine to eliminate trap hazards; extremities (hands, fingers) are kept out of harm way during operation; avoid machinery accidents by all mean.
- Ensure that no worker is exposed to noise level greater than 85-90 dBA. (Provide PPEs, ear muffs, ear plugs).
- Avoid, prevent whole body vibration, and hand-arm vibration. Reduce working hours for high level noise and vibration works.
- Provide PPE (eg. face masks, mouth and nose covers, and gas masks) to workers exposed to long hours of dust and smoke.
- Conduct regular general medical check-up for all workers annual.
- Also conduct regular specific medical check-up for workers exposed to long hours of dust emission; especially for respiratory tract and lung ailments. In addition conduct lung function testing for them at least every 6 months (semi-annually) with the aid of medical specialist.

Electrical

- Use new electric cords, cables, device and equipment; regularly check them for faults.
- Mark all electrical devices and lines with warning signs.

Hot work

- Provide PPE, e.g. protective suits including insulation gloves and boots to workers working near kiln,

Eye hazards

- Provide goggle or face mask where necessary; provide eye wash station sink for emergency washing of eyes.

Industrial vehicle driving and site traffic and outward traffic

- Train operators in the safe operations of excavators, dozers, cranes, and forklifts, etc.

Ergonomics, repetitive motions and manual handling

- Ensure that workers are not subjected to excessive repetitive movement, over exertion and excessive manual handling to prevent strain, sprain, and injuries.
- Use mechanical labour rather than manual labour; apply automation system as far as possible.

Potential chemical hazards

- Small quantity of hazards chemical (acids) have to be used in laboratory.
- Educate train and supervise staff for safety storage, handling and application.
- Label all chemicals (pictogram); keep MSDS for hazardous ones.

Fire and explosion

- Fuel and flammable storage in secured spots (safety fuel depot).
- Store flammable away from ignition sources and oxidizing materials.
- Specialized training for storage, handling and uses of fuel oil.
- Keep adequate fire extinguishers, equipment, (fire fighting pond to be always full of water).
- Define and label warning signs for all fire hazards area.

Monitoring plan

- Regular inspection of work places and working condition.
- Regular inspection of factory's clinic; monitor log book on accident, injuries, sickness; number of patients treatment at clinic and admitted to hospital.
- Inspection medicines and drugs; refill where necessary
- Monitor First Aid training.

Parameter to be monitored: working conditions.

Monitoring point

- At all main work places, coordinates : N. Lat. 21°45'17.60"; E. Long. 96°16'29.79"
- At factory's clinic, coordinates : N. Lat. 21° 44' 49.46", E. Long. 96° 16' 30.95"

Frequency: daily and weekly.

Also monitor effectiveness of mitigation/corrective measures taken.

Budget and responsibilities

Budgets: Ks. 3,160,300, costs for provision of medicines and drugs and First Aid facility at factory clinic for one year. (This will be from the allotted EMP fund, where 10% of the fund under emergency programme.)

Responsibilities – The two nurses and EMP cell members.



LEGEND

 Occupational health and safety

Figure – 65: Satellite image showing points of management and monitoring sub-plan for Occupational Health and Safety

12. Community Health and Safety

Objectives

- To ensure that the activities of the project do not have any adverse effect on the health and safety as well as social well-being of the local community.

Legal requirement

- Comply with Myanmar Public Health Law, 1972; the Prevention and Control of Communicable Diseases Law, 1995; the Environmental Conservation Law, 2012 and the Environmental Conservation Rules, 2014.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Control smoke and dust as practical as possible; avoid open burning of debris and trash so that smoke will not reach the village; educate the driver to lower speed when passing near or through the village (the reduction of speed from 40 km to 35 km can reduce dust to 50%, it is learnt).
- Locals should be able to file complaints regarding dust, noise and vibration (through GRM system).
- Ensure that the water ponds do not become breeding ground for mosquitoes; regularly changing of water; application of mild chlorination; annihilation of mosquito larvae by all means; educate workers to use mosquito's nets at night and provision of mosquito nets.
- Also ensure that domestic solid wastes, liquid waste water and drainage do not become breeding ground for flies, mosquitoes and insect for prevention of vector borne diseases and water borne or water related disease.
- Prevent the occurrence and spread of infectious and communicable diseases by all means; undertake health awareness and educations initiative (health education campaign) in local community as far as possible. The clinic at the site also provide health care for locals as practical as possible.
- Avoid/minimize by all means, vector borne, water borne (water based, water related) disease and communicable diseases that would result from project activities. Liaise with Township Health Authority regularly.

- Avoid/minimize by all mean spread of diseases from workers. Educate long distance truck driver regarding sex education example for use of prophylactic condom; prevent spread of STD, HIV/AIDS.
- Educate workers regarding code of conducts, social conducts, etiquette and local culture and tradition.
- Educate drivers for safe driving and defensive driving and to comply with rules and regulation regarding traffic; also conduct road safety education campaign for the local community, if possible; locals should be able to file complaint regarding traffic (through GRM system).
- Comply with law and regulation relevant to transportation of hazardous materials such as fuel oils; also plan for measures for preventing and/or mitigation the consequence of accidental release/spill of (fuel oil); avoid/minimize community exposure to hazardous materials.
- Develop emergency preparedness and emergency response plan and contingency plan (action plan) for effective implementation when necessary; provide operation manuals for external emergency plan and internal emergency plan for all workers and if necessary also to local community and government inspectors. Conduct rehearsals or drills for such plan. Cooperation with local community and authority in preparation of emergency plan.

Monitoring plan

- Monitor the overall health situation of the 2 nearby villages; occasional inquiry of the health issues of the villagers at two villages, providing Health Education; giving health education lectures.

Parameters to be monitored: overall health situation of locals.

Frequency: annually (with the help of personnel from Lei-way Township Health Department.

Budget and responsibilities

Budgets: Ks 2,000,000, costs for fees or courtesy gifts to Township Health Department personals who will give health educative speeches and lectures. (The expenses will be from the allotted EMP fund, where 7% of the fund under capacity building and training.)

Responsibilities

EMP cell members and personals from Township Health Department (who will be requested to help execution of Community Health and Safety programme).

13. Cultural heritage

Objective

- Not to have any adverse impact on the cultural/religious heritage (monasteries and pagodas and churches) in the area due to activities of the project.

Legal requirement

- Comply with "the Protection and Preservation of Cultural Heritage Region Law, 2019", "Protection and Preservation of Ancient Monument Law, 2015"; protect the religious component of the surrounding area.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Ensure that the factories activities have no negative impact on the monastery and pagoda.
- Also ensure that the said activities have no negative impact on the village Buddhist monastery and pagoda.
- Monitor the situation bi-monthly; conduct visual inspection of the said monasteries, pagoda and churches.
- Pay courtesy visit (obeisance visit) occasionally the abbot monks of the monasteries and offer cash and kinds.
- Try to build good and cordial relation with both the Buddhist and Christian communities.
- Get involve in religious festivals; provide donations.

Monitoring plan

- The village monasteries of two villages.

Frequency – occasionally, especially during religious festivals days.

Budget and responsibilities

Budget: appropriate Ks 2,500,000 per year for donation and charities for the above mentioned monasteries, pagoda and churches. The money will be from CSR programme fund, not EMP fund.

Responsibilities – the factory manager and EMP cell members.

14. Employment and training

Objectives

- To prioritize employment of the locals as practical as possible; to organize induction training and long term professional training.

Legal requirement

- Comply with Employment and Skill Development Law, 2013.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Plan for human resource development.
- Prioritize employing locals as far as possible.
- Organize new task employees for job training.
- Also provide systematic induction training for new workers to enable them to do their jobs efficiently.
- Induction training will cover: general training; skill training for efficiency and mandatory training relating to health and safety (e.g. safety operation of machinery and handling of hazardous materials such as fuel.
- Educate and train them for good working practice, good safety practice, good health and hygiene practice and good environmental awareness practice until all these practices are ingrained in their mind sets and become good habits.
- Educate and train them for familiarization with negative impacts and subsequent taking of mitigation measures.
- Educate and train them for basic eco-friendly behaviours e.g. good house-keeping practice, do not litter, do not dirty your place, minimize the use of water, fuel.
- More specific training for operation of heavy machinery and specific machinery and equipment and heavy trucks will be organized.
- Review on the effectiveness of training will be done for improvement.
- Overall regular monitoring of activities at the site will be conducted.

Monitoring plan

Monitoring sites – all main work places (inspect/monitor training programme, training course, training in process; work efficiency of workers).

Also monitor effectiveness of training programme: monthly or every training session.

Budget and responsibilities

Budgets

- Free of charges (the company's senior staff member, technicians and experienced staff with educate, train and supervise new workers.
- However, appropriate Ks 2,000,000 (fees and courtesy gifts for trainers and educators from relevant governmental department).

Responsibilities

The factory managers, senior staffs and EMP cell members.

15. Emergency response

Objectives

- To maintain emergency preparedness, and response to any emergency in a systematic and effective way.
- To execute emergency response plan, emergency procedure plan, rescue operation plan, contingency plan and aftermath plan, all in a systematic manner.

Legal requirement

- Comply with The Fire Brigade Law, 2015; The Factories Act, 1951; Occupational Health and Safety Law, 2019.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Prepare Emergency Response Plan (ERP) and team to prevent fatalities and injuries, to reduce damage and to protect environment and community.
- Prepare emergency preparedness plan execute the plan.

- (Emergency Response Plan will cover emergency resources, emergency preparedness and training, emergency response procedures, administration of the plan, first aid work, rescue operation works, communication and procedures, and debriefing and post-traumatic stress procedures.)
- For practical purpose provide training for fire fighting, training for First Aid and Rescue.
- Provide facilities (e.g. fire fighting trucks, fire extinguishers, equipment, suit, first aid kits, emergency vehicle).
- Display phone numbers of Fire fighting Department, Ambulance Services, Red Cross Society, Hospital and Police Station.
- Review on the effectiveness of training will be done for improvement.
- Regular monitoring of all activities at the project site will be conducted.
- Mock drill for ERP will be conducted, on a regular basis; bi-annually.

Monitoring plan

- Monitor fire fighting training activities during training session,
- Monitor First Aid training activities during training session.
- Also monitor rehearsal or mock drill session for emergency response.
- Monitor activities at main work places such as; crusher site, in and around the factory especially at kiln site on a daily or weekly basis.
- Inspect facilities for emergency preparedness.

Frequency

- Daily or at least weekly at all main work sites; monitor training only during training session; monitor mock drill only during drill session.

Budget and responsibilities

Budget – Ks 14,000,000, set aside for execution of emergency response plan. In case of major accident like major fire budget for emergency will be used mainly for compensation for injured, sick or dead employees; and also for rehabilitation of injured and disabled employees.

No other fees or charges as emergency response plan will be executed by EMP cell members who are well-paid employees.

Responsibilities

EMP cell leaders, EMP cell members and some staff trained for emergency response.

16. Traffic safety

Objectives

- To ensure for the safety of traffic in the area, especially along the 10 miles access road constructed by the company.
- To avoid traffic congestion along the access road and particularly at the intersection where the access road meets the High way.
- To aim for zero road/traffic accidents.

Legal requirement

- Comply with Vehicle Safety and Motor Vehicle Management Law, 2020; Highways Law, 2000 and regulation regarding road traffic.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Plan for traffic safety; try to achieve zero traffic accident.
- Draw up a traffic management plan (even though the traffic is light on this 10 miles access road).
- Set up more signage's for speed limits, if necessary, e.g. near schools, public places.
- Schedule the logistic, especially for trucks.
- Avoid over loading trucks; comply with regulation.
- Cover haulage (cement bags, coal, gypsum etc.) with tarpaulin to prevent spills.
- Educate driver (heavy truck drivers) for driving at reduced speed and adhere to the principle of defensive driving.
- Educate drivers for complying with traffic and road regulations.
- Provide traffic education, not only for drivers, but also for motorcyclists.
- Keep a log book for each vehicle.
- Check the arrival and departure of all vehicles at the site.
- If possible, conduct education campaign for traffic to the local communities.

Monitoring plan

- Inspect the condition of the vehicles fortnightly;
- Monitor traffic on the access road on a weekly basis.
- Monitor the daily arrival and departure of vehicle at the factory premise.
- Monitor the log book for each vehicle on a weekly basis.

Monitoring point: at a point on the access road outside the factory.

Frequency: daily, weekly and fortnightly as mentioned above.

Budget and responsibilities

Free of charge. The EMP cell members who are well-paid employees will do this work free of charge.

The costs for vehicular repairs or maintenance will be borne by the main budget, not by the EMP fund.

Responsibilities

EMP cell leaders and EMP cell members.

17. Aesthetics, potential visual issue

Objectives

- To ensure that the implementation of the cement project does not have any negative impact on the visual component of the area.
- To make the cement factory complex in harmony with the surrounding environs as practical as possible.
- To prevent sight pollution/visual pollution.

Legal requirement

- Comply with the Environmental Conservation Law, 2012 and the Environmental Conservation Rules, 2014; not to destroy the environment preserve the natural beauty of the area as practical as possible.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule:

- The sub-plans will be implemented during the Operation Phase.

Management action

- Plan and manage for the operation of the cement factory which focuses on aesthetic appeal.
- Create green lawn, green zone and green belt when Construction Phase is over; plant fast growing trees, shade trees along the periphery of the factory's compound; create green lawn in available space, landscaping for aesthetic beauty purpose, also plant trees outside the compound, along both side of main access roads and other roads.
- Maintain the building and structures; repaint annually or bi-annually (do not let the building turning into drab or dull colour).
- Try to keep the site in harmony with its surrounding; (planting of trees will tackle this issue); reserve green area in the vicinity as far as possible.
- Avoid excessive use of bright light at night (light pollution); white light attracts insects to aggregate and get killed; use yellow light.
- Ensure that the light is not offensive to local community; use light only for security for purpose, not for show.
- Do not direct the lamps/bulbs at the lamp posts outwards (offensive to neighbour and also to wildlife); keep the lamps/bulbs in slanting position.
- Install a bulb at the top of the stack to prevent hazards for air planes.

Monitoring plan

- Monitor the maintenance of green belt, green lawn, green landscaping on a fortnightly or monthly basis (green belt, green lawn, landscape are already established)
- Also monitor the 500 acres teak plantation established by the company from time to time.
- Monitor the annually or biannually painting of buildings and structures of the factory compound (ensure that offensive paint colour is not used).
- Monitor the situation of lighting at the factory compound weekly or monthly (ensure that offensive bright white lights are not used).

Monitoring point

- Green belt, green zone, green lawn, 500 acres teak plantation, all lamps and bulbs during night time (ensure for execute lighting).

Budget and responsibilities

Free of charge. The costs for setting up plant hatchery, establishment of green belt, green lawn, teak plantation were all supported by the main budget (not from EMP fund).

Gardeners who maintain green lawn, green landscape are all well-paid employees, therefore, no more fees or expense required.

Responsibilities

EMP cell members who supervise gardeners.

8.6.3 During Decommissioning Phase

The issues or component to be managed and monitored during the Decommissioning Phase are much lesser in numbers and smaller in magnitudes. After Operation Phase virtually all activities will come to an end.

Management and monitoring sub-plans during Decommissioning/Rehabilitation Phase

1. Air quality

Objectives

- To prevent pollution of air.
- To ensure that air quality is not deteriorated after the end of the operation of the project.
- To ensure that ecology of the area is not degraded at the end of the project.
- Ensure that the site remain an environmentally healthy site for the local people.

Legal requirement

- Comply with NEQEG (emission) guideline (2015); Code No.1.1, the Environmental Conservation Law, 2012.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub-plan will be implemented during the Decommissioning/Rehabilitation Phase.

Management action

- Try to manage and control all Decommissioning works
- Test the air quality once at the early stage of Decommissioning Phase and test another one for the last time at the end of Decommissioning Phase.
- Ensure that the air quality remain in good condition after the end of the project.

Monitoring plan

- Monitor Decommissioning activities daily or weekly
- Monitor air quality testing during early phase and monitor for the last time at the end of Decommissioning Phase.

Parameter to be monitored: NO₂, SO₂, PM₁₀, PM_{2.5} and O₃.

Monitoring point : inside the factory compound.

Budget and responsibilities

Budget: Ks 5,100,000 (once off cost)

Responsibilities: hired technicians and EMP cell members.

2. Water quality

Objectives

- To prevent pollution of water.
- To ensure that water quality at the weir and stream is not deteriorated after the end of the Operation Phase.
- To ensure that the aquatic ecology of the stream is not degraded after the end of the Operation Phase.

Legal requirement

- Comply with National Drinking Water Quality Standard, 2019

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub-plan will be implemented during the Decommissioning Phase.

Management action

- Test water quality at the beginning of Decommissioning Phase.
- Test water quality for the last time near the end of Decommissioning Phase.
- Maintain good housekeeping habit; avoid discarding solid or liquid wastes into the stream by all means.
- Avoid accidental spills of fuel oil into the stream.
- Maintain machinery and vehicles to prevent leaks.

Monitoring plan

- Monitor all Decommissioning activities.
- Monitor water quality of the stream.

Parameters to be monitored: Total coliforms, Fecal coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron, P^H, Sulphate, Total Dissolved Solids

Monitoring points:

- Myitnge River, coordinates: N. Lat. 21° 46' 38.3"; E. Long. 96° 16' 30.3"
- Nat Yay Kan village, coordinates: N. Lat. 21° 44' 35.9"; E. Long. 96° 14' 52.0"
- Kandwin village, coordinates: N. Lat. 21° 46' 53.1"; E. Long. 96° 14' 15.0"

Frequency: once during early Decommissioning Phase.

Budget and responsibilities

Budget: Ks. 600,000 (once off cost)

Responsibilities: hired technicians and EMP cell members.

3. Soil quality

Objectives

- To prevent contamination of soil.
- To ensure that soil quality is not degraded after Operation Phase of the project.

Legal requirement

- Comply with Environmental Conservation Law, (2012) and Environmental Conservation Rules, (2014); protect and conserve land environment.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub-plan will be implemented during the Decommissioning Phase.

Management action

- Conduct regular visual inspection of ground and soil.
- Prevent destruction of soil structure during this phase.
- Also prevent contamination of soil such as oil spills or leak; remove spill immediately, if any.
- Level the ground, refill and rake the soil to maintain soil profile and soil condition.
- Ensure that the soil ecology remain intact after the end of the project.
- Test soil quality for the last time; ensure that the site is ecologically restored.

Monitoring plan

- Monitor the Decommission activities daily or regularly.
- Monitor soil restoration activities weekly or regularly.

Parameter to be monitored: soil quality (with the aid of hired technicians).

Monitoring points:

- At factory site, coordinates : N. Lat. 21° 44' 44.7"; E. Long. 96° 16' 40.1".
- At Nat Yay Kan village, coordinates : N. Lat. 21° 44' 33.3"; E. Long. 96° 15' 01.8"
- At Kandwin village, coordinates : N. Lat. 21° 46' 52.5"; E. Long. 96° 14' 14.1"

Frequency:

- Monitor decommissioning activities : daily
- Monitor soil restoration, reclamation - weekly test soil quality for the last time.

Budget and responsibilities

Budget: Ks 150,000 (once off cost)

- Soil quality to be analysed by hired technicians.

Responsibilities – hired technicians and EMP cell members.

4. Erosion and sedimentation

Objectives

- To avoid, prevent, manage and mitigate potential soil erosion and sedimentation.
- To maintain natural ecology as practical as possible.

Legal requirement

- Comply with Environmental Conservation Law, (2012) and Environmental Conservation Rules, (2014) not to cause destruction of soil profile, and conservation of soil ecology.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub-plan will be implemented during the Decommissioning Phase.

Management action

- Continue erosion control management applied during the Operation Phase.
- Keep drainage system inside the factory intact also keep natural drainage system in the vicinity intact.
- Ensure that Decommissioning activities do not impact soil structure and soil profile.
- Ensure that the soil profile is stable and not easily eroded.
- Conduct visual inspection of the land and soil especially during the rainy season, to tackle any issue of erosion.

Monitoring plan

- Monitor decommissioning activities daily or weekly.
- Monitor the drainage system on a regular basic – weekly or monthly especially during rainy season.
- Conduct regular visual inspection of the site and environ.

Parameter to be monitored: soil structure, soil profile; any potential erosion phenomenon.

Monitoring point: inside the factory compound.

Frequency: from time to time; weekly or monthly during wet months.

Budget and responsibilities

Budget: free of charge (EMP cell members who are well-paid staff will manage this issue).

Responsibilities: EMP cell leaders and EMP cell members.

5. Biodiversity

Objectives

- To prevent and conserve biodiversity (biological component) of the area as practical as possible.

Legal requirement

- Comply with the Conservation of Biodiversity and Protected Areas Law, 2018; not to destroy or impact natural habitats biological ecosystem.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub-plan will be implemented during the Decommissioning Phase.

Management action

- Undertake effective rehabilitation (reforestation) during Decommissioning Phase.
- Ensure that Decommissioning activities have no impact on the biological component of the area.
- Ensure that replanted trees are all well-re-established; replant more new sapling if necessary.
- Continue regular tending (watering, weeding, application of fertilizer where necessary) for at least 2 years.
- Ensure that the biodiversity (biological component) of the area remain intact and that the ecology is restored to its quasi-original condition.

Monitoring plan

- Monitor all Decommissioning activities on a regular basis, daily or weekly.
- Monitor reforestation/replanting activities; to ensure that reforestation is successful.
- Monitor the maintenance of replanted trees regularly till the last day of Rehabilitation Phase.

Parameter to be monitored: the biological component (flora, fauna) of the area in the form of regular visual inspection of the habitats.

Monitoring point: both inside and outside the project site.

Frequency : weekly or monthly and from time to time.

Budget and responsibilities

Budget: Free of charge (management and monitoring of biodiversity will be undertaken by well-paid employees; no experts or technicians need to be hired).

Responsibilities: EMP cell leaders and EMP cell members.

6. Community health and safety

Objectives

- To ensure that the community health and safety are not compromised during Decommissioning/Rehabilitation Phase.
- To ensure is the site is safe for local community after the completion of the project. (No soil contamination, no water pollution, no air pollution and no hazardous substance remain.)

Legal requirement

- Comply with Environmental Conservation Law, (2012), Environmental Conservation Rules (2014) and Public Health Law, 1972.

Overview maps, layout map, images, aerial photo, satellite image

- These are already shown earlier in Chapters 4 and 5 will not be repeated here.

Implementation schedule

This sub-plan will be implemented during the Decommissioning Phase.

Management action

- Continue the implementation of Community Health and Safety sub-plan implemented during the Operation Phase.
- Continue the management and monitoring of CHS component/issue executed during the operation.
- Ensure that Decommissioning/Rehabilitation activities have no negative impact on the local community.
- Ensure that the air, water and land are not polluted in the aftermath of the project life (that the project site is environmentally and socially safe for all the local people).
- Conduct all visual inspection and enquiry for overall health situation of the nearby 2 villages with the aid of Health authority.

Monitoring plan

- Monitor the Decommissioning/Rehabilitation activities daily or weekly.
- Monitor any potential impacts such as emission, effluent, noise etc. That will impact the local community.
- Monitor the potential or condition for water related disease that will effect the local community.
- Monitor the possibility of occurrence and spread of infectious and communicable disease.

- Avoid/prevent the spread of disease from company's workers.
- Monitor implementation of emergency response plan implemented during the long Operation Phase.

Monitoring points:

- The two villages nearby; visual inspection of the overall health situation with the aid of Township Health Personnel at least once during the Decommissioning Phase.

Frequency:

- Monitor decommissioning/rehabilitation activities; weekly.
- Monitor hygiene and sanitation condition of project site and employee semi-annually.
- Visual inspection of overall health situation of 2 villages with help of Health Authority; at least once during the Decommissioning Phase.

Budget and responsibilities

Budget – Ks 2,000,000 set aside and to be allotted as fees and courtesy gifts for Township Health personnel during overall health survey on the 2 villages nearby. Medicines and drugs to be provided from the factory clinic.

Responsibilities – factory manager and EMP cell leader (with the help of Township Health Department personnel).

Commitment

Young Investment Group Industry Co., Ltd has made a commitment to duly implement the EMP described in this chapter 8 as practical as possible.

Daw Hla Myat Thu

Director

Young Investment Group Industry Co. Ltd

9. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

Public consultation is an integral part of both EIA and IEE. Involving the public participation in the EIA work is fundamental to increasing the understanding and acceptance of the project.

Public consultation and participation should be started as early as possible in the preparation of EIA. And it has to be a continuous process, especially during the Operation Phase, carry out from time to time.

9.1 Purposes of the consultation during the preparation of the EIA report

- to enlighten the locals/stakeholders about the project
- to increase the understanding and acceptance of the project
- to give the locals/stakeholders the opportunity to present their views, opinions, perception of the project, express their concerns, complaints, grievances etc
- to identify impacts and issues that are not immediately obvious to project proponent and the EIA team
- to access social assistant and community development needs for the locals/stakeholders
- to gain community consent and to interact with the people to further strengthen existing cordial relationship
- to tap local knowledge and to negotiate for mutually beneficial future that is sustainable and locally relevant

Requirements for public consultations:

- public consultation should be conducted in the early phase of project
- must ensure the direct involvement of the locals/stakeholders
- must ensure that all locals/stakeholders who are interested will have the chance to fully participate, especially the vulnerable and marginalized group,
- it should be a continuous process --- throughout the entire phase of the project, especially during the long Operation Phase, and
- there must be an action plan or response programme such as complaints and grievances mechanism (CGM) to tackle any issue.

9.2 Methodology and approach

Standard methodology applied here includes:

- (i) **Consensus building:** First of all a pre-sensitizing visits to the local authority (Village Administrator and party, elders) and briefing on the proposed project to be carried out and ask for their approval and assistant for holding the public consultation.
- (ii) **Transect walk:** site visit (visit to the village) and conduct visual inspection.
- (iii) **Actual public consultation meeting:** mainly involves disclosure of the proposed project and giving complete and accurate information; consultation mainly in the form of two-way conversation --- listening and talking; waiting for their response; further discussion.
- (iv) **Interviews and discussions:**
 - in the form of KII/SS, (Key Informant Interview/Secondary Source) for the gathering of secondary baseline socio-economical data and community profile with the aid of pre-structured/pre-designed questionnaires
 - in the form of FGD (Focal Group Discussion); interview with few selected people (authority, knowledgeable persons) especially for ranking the pressing need of the locals for prioritizing the needs for community assistance and implementation of CSR.
 - in the form of HHI (Households Interview) for gathering of socio-economic data (this is not done as the EIA report is not specialized on socio-economic aspects.)

9.3 Public of consultations

First public consultation meeting

The first public consultation meeting between the responsible officials of the company and the locals was held on 20-3-2014 at monastery of Nat-yay-kan village. It was attended by the village Administrator, U Kan Sa and members, the village elders, and stakeholders, totaling 51 people.

U Zaw Thein, the manager, explained to the attendees about the proposed project. From that meeting it is learnt that there was high acceptance of the project by the locals.



Figure – 66: First public meeting at village monastery

Second public consultation meeting

The second public meeting was again held on 20-3-2017 at Nat-yay-kan village. It was attended by the village administrator and members, village elders and stakeholders, totaling 139 people.

U Zaw Thein explained to the attendees about the proposed project and pledged to contribute Ks 100,000,000 for community development of the area (at least for 3 villages) when the proposed project commences.



Figure – 67: Second public meeting at the village ground

Briefing with the authority and hluttaw member

A briefing meeting with the authorities was held on 28-3-2017 at Sintgaing Town. It was attended by Dr. Kyi Moe Moe Lwin, member of Pyithu Hluttaw, U Aung Naing Linn, member of Amyotha Hluttaw, U Hlaing Win, member of Mandalay Region Hluttaw, and heads of departments of Township level comprising Department of Construction, Town ship Development Committee, General Administration Department, Forest Department, Land-use Department and Rural Development.

U Zaw Thein, the responsible officer of the company briefed the authorities concerned on the proposed limestone quarry project.



Figure – 68: Briefing meeting with members of Hluttaws and regional authorities

Site inspection by authorities

A site inspection by the above-mentioned authorities to the proposed project site was made on 1-4-2017. U Zaw Thein showed them around the site and explained to them how the project will be implemented when the approval from MIC was obtained.

The question asked by members of parliament and authorities were:

- Where are you going to conduct the blasting?
- Is the plot of land wide enough for the project?
- Where are the sources of water and electricity?

U Zaw Thein replied that:

- Blasting will be conducted at the top of the mountain range (not at the foot hill). (This will be described another report for limestone mining/quarrying.)
- If the plot is not wide enough for the implementation of the project additional pieces of land will be purchased (in the adjacent Kyaukse Township area).
- Water will be sourced from the river water lifting project (the Ministry of Agriculture and Irrigation) on the Myitnge River, 3 miles away.
- Electricity will be sourced from the Shwe-sar-yan sub station, 7 miles away. (The company has also a plan for building coal-fired power plant.)



Figure – 69: Site inspection by members of Hluttaws and regional authorities

9.3.1 Public consultation meeting during the scoping study

During this scoping survey a preliminary public consultation meeting was held on 29-7-2017, at Nat-yay-kan Village at the resident of U Kan Sa, village administrative member (Yar-eain-hmoo). Village elders and interested locals totaling 10 attended the meeting. The villagers are already familiar with the proposed project and showed little interest.

The responsible officer of the company, U Myint Kyaw Linn and leader of the scoping team, U Myint Kyaw Thura are also among the attendees.



Figure-70: FGD



Figure – 71: Pre-public consultation during scoping survey

Minutes of meeting

U Myint Kyaw Linn first of all explained to the locals about the proposed project. The locals were invited to express their views.

U Paw Swe: The companies used to give promise at the start but later there were precedents where the promises were not kept. This should not happen here. Previous meeting have been held between this company and the locals. The promises given then should be kept. There can be inevitable impacts due to the implementation of the project. There are educated village youths. They should be prioritized for employment as clerks in the factory if there is any need for clerks.

U Thaug Shwe: Previously a meeting was held between the company and our villager at the monastery. The company has promised to electrify the village when the project commences. But now our village has already access to gridline electricity according the plan of the regional government. Therefore I would like to ask for other community development plan for the village. What our village needs most now is a bridge to be built at the spot where it is submerged when the river is flooded.

U Myint Kyaw Linn (officer of the company): As regards prioritizing employment for the villagers when the project commences it is OK for me. I can do that. As for raising the fund for the village I have to report this matter to our Managing Director. The bridge will be built, our company has pledged to contribute one hundred million Kyats for community development, during an earlier meeting.

U Kan Tin: I support the factory project. I will provide help if it necessary. Our villagers are simple people and there are no opportunists. As the company has promised to contribute to the village community development I want the company to keep its promise when the project commence.

U Myint Kyaw Linn (the officer of the company): Thank you for saying this.

U Than Nyunt: All our wishes are already expressed earlier by our people who have spoken up. I agree with the implementation of the project.

Result of public meeting during the scoping study

One local U Paw Swe asked the company to keep its promise when the proposed project has commenced. He also asked for the company to prioritize the employment of the local youths.

One local U Thaug Shwe asked for the construction of a bridge at the spot which is submerged during the rainy season when it is usually flood.

The responsible officer replied that he will duly report these matter to the company authority for taking actions when the proposed project has commenced.

From this preliminary meeting it was quite clear that the implementation of the project is welcome and the level of acceptance is high. According to the village elders most young people are unemployed and hoping for job opportunity from the project, and so even blue collar job will be much better than an un-employed life.

Further ongoing public consultation meeting

An inclusive public consultation meeting will be held during the follow up EIA survey

The programme for public consultation to be undertaken during the follow up EIA study phase will strictly follow the procedures and, most of all, the format laid down by ECD, MONREC. The format includes sub-sections and sub-topics such as, - purpose, methodology and approach; summary of consultation activities, including dates, venues, attendance, topics; summary of main comments received from stakeholders and interested groups and issues raised; minutes of consultation meeting; identification on how the comment or issues were taken in account; information disclosure; and recommendation for future consultations.

Actual public consultation meeting will be held during the coming EIA study. And as a TOR for EIA all the afore-mentioned agenda or topics (sub-sections and sub-topics) will be addressed and reported in the EIA report.

Public consultation meeting will be a continuous process throughout the project life, especially during the long Operation Phase, where annual or bi-annual meeting will be held or held from time to time when there is a need for such meeting.

9.3.2 Public consultation meeting during the EIA study

During EIA study two public consultation meetings (one at Nat Yay Kan village and another at Kandwin village) were conducted.

(a) Public consultation at Nat Yay Kan village

Date	- 18-1-2024
Time	- 13:30 – 14:30 hours
Venue	- At the resident of the village administrator
Attended	- 63 persons

All head of households (323 households) were invited. There was no community group (local based organization) in the area.



Figure-72: KII at Nat Yay Kan village



Figure-73: FGD at Nat Yay Kan village



Figure-74: Public consultation meeting at Nat Yay Kan village

Minutes of meeting

First the village administrator, very briefly explained to the participants, locals and stakeholders why this public consultation meeting was held. Then U Nyi Nyi Tun, the responsible officer of the company explained to the locals about the project.

U Nyi Nyi Tun (responsible officer)

Mingalarbar to all. My name is U Nyi Nyi Tun. Our project is for the establishment of a cement factory (capacity 5000 tons/day) by two lines.

This meeting was held to explain to you about the EIA to be conducted.

We will need many workers when the project commenced. We have a plan for employing the locals; there many locals will have suitable jobs. We have also plan for providing housing for workers.

We will do our best to minimize impact on the environment when operating the factory. For example we will install dust collectors mitigate dust.

U Myint Kyaw Thura (head of EIA team)

Mingalarbar to all. Thank you all for your attendance. My name is Myint Kyaw Thura. The name of our organization is MESC, and it is a neutral party/third party.

We are here to assess both the positive and negative impacts the project will have on the health, socio-economic, social and religious aspects. We have measures air and water quality and collecting soil sample for later analysis. This is done in order to assess any impact. All our findings will be incorporated into the EIA report.

Public consultation meeting will be one chapter in our EIA report. This meeting is held in order to know your view and opinion in a transparent way. Therefore, invite you to speak up and express your view, opinion and concern frankly.

U Maung Lwin , (a local)

I believe that this project will bring benefit to our locals. And I also envisage more job opportunities to our locals.

U Myint Ngwe (a local)

Most of us are involved in small scale animal farming and seasonal jobs. I hope that such a project will bring more jobs and raise the standard of living for the locals.

U Yan Naing Soe (a local)

I want to ask the responsible officer to assist in village development as far as possible. Also prioritize employing our youths when the project has commenced.

U Nyi Nyi Tun (officer)

We have recorded all your comments and will do our best for the sake of the locals.

The meeting was over at 14:30 hours.

(b) Public consultation at Kandwin village

- Date - 18-1-2024
- Time - 15:00 – 16:00 hours
- Venue - At the resident of the village administrator
- Attended - 80 persons



Figure-75: KII at Kandwin village



Figure-76: FGD at Kandwin village



Figure-77: Public consultation meeting at Kandwin village

Minutes of meeting

First of all the village administrator delivered an address and explained to the attendees why that meeting was held.

Then U Nyi Nyi Tun, responsible officer of the company explained to the participants about the project.

U Nyi Nyi Tun (responsible officer)

Mingalarbar to all. My name is U Nyi Nyi Tun. Our project is for the establishment of a cement factory (capacity 5000 tons/day) by two lines.

This meeting was held to explain to you about the EIA to be conducted.

We will need many workers when the project commenced. We have a plan for employing the locals; there many locals will have suitable jobs. We have also plan for providing housing for workers.

We will do our best to minimize impact on the environment when operating the factory. For example we will install dust collectors mitigate dust.

U Myint Kyaw Thura (head of EIA team)

Mingalarbar to all. Thank you all for your attendance. My name is Myint Kyaw Thura. The name of our organization is MESC, and it is a neutral party/third party.

We are here to assess both the positive and negative impacts the project will have on the health, socio-economic, social and religious aspects. We have measures air and water quality and collecting soil sample for later analysis. This is done in order to assess any impact. All our findings will be incorporated into the EIA report.

Public consultation meeting will be one chapter in our EIA report. This meeting is held in order to know your view and opinion in a transparent way. Therefore, invite you to speak up and express your view, opinion and concern frankly.

U Min Lwin, a local

He expressed his view that if the project is implemented many locals will get employment.

U Sein Win, a local

I requested the company to provide assistance for the community development. When the factory is in Operation Phase give first priority to our local people for employment; employ them at suitable jobs.

U Win Aung, a local

At the moment the village school is in the process of renovation. I request the company to provide assistance for this. Thank you for holding this meeting and explaining about the proposed project.

U Nyi Nyi Tun, the responsible officer of the company

We have recorded and all the minutes of meeting today and we will do our best regarding your request.

After this meeting we will meet with the school renovation committee and provide financial assistance.

The meeting was over at 16:00 hours.

Result of public meeting during the scoping study

The meeting has ended in a cordial and friendly way. The local people have been very familiar with this company for quite a long time, since 2014 when the first meeting consultation meeting was held. Later member of Hluttaw and authorities concerned have also visited the site and villages and held two meeting.

The consultation meeting during the Scoping Study was also held on 29-7-2017.

The project has not materialized yet (still only in the Preconstruction Phase) and the locals have great anticipation and hope for employment opportunities.

There were no are speaking against the project. It is quite clear that the implementation of the project is welcome and the level of acceptance is high.

Young Investment Group Industry Co., Ltd, is quite well-known for their philanthropy.

Young Investment Group Industry Co., Ltd has so far already spent Ks 70,100,000 for CSR programme for this area even before the project has actually commenced and even before any profit is realized yet.

9.4 Further ongoing consultations

As mentioned earlier public consultation must be a continuous process throughout the project period, from the Pre-Construction Phase, through the Construction Phase and Operation Phase to the Decommissioning Phase. As regards the long Operation Phase (30 years) there should be regular public consultations annually or bi-annually depending on the situation, or from time to time whenever there is a need for public consultation. This is very important for maintaining the long term cordial relationship with the locals and hence the long term benefit for cement production business.

The Complaints and Grievances Mechanism (CGM) programme shall be implemented throughout the entire Operation Phase period. It shall be practical and applicable and effective. The public relation officer and EMP cell leader shall always give special attention to CGM.

The complaints handling and response must be effective. A hotline for complaint must be set up. The date and time of complaints, detail of complaint, action taken and if no action is required the reason why must be all recorded and documented. There can be also follow up contact with complainants.

Example of the log book sheet for GRM:

1. Name of complainant (person/organization) -----
2. Date of receipt -----
3. Summary of complaint/grievance -----
4. Date of action taken -----
5. Action taken by who -----
6. If action is not required give the reason why -----
7. Grievance resolved/settled (Yes/No) -----
8. Any post GRM contact (Yes/No) -----
9. Any follow up issue or action (Yes/No) -----
10. Need a legal expert (Yes/No) -----

Future public consultation will involve the continuation of CSR programme and donation and charity works as far as possible.

9.5 Information Disclosure

Public consultations made at the two villages mentioned above involving the local community, responsible persons from the company and EIA team was made public.

Copies of minutes of two meetings (during scoping study and during EIA) were distributed at each village administrator office and one copy each was kept at the company office and MESC office.

When this EIA report is approved by the authority part of the EIA report, particularly the executive summary will be lunched at the Facebook website of MESC, <https://www.myanmar.environment.sustainable.conservation.com>.

Copies of the approved EIA report will be kept at the company's office and the office of MESC for perusal, by any interested people.

Commitment:

The project proponent, Young Investment Group Industry Co., Ltd commits to build good relation with the local community and heeds to their opinions, views and concerns as far as possible. Further public consultation meeting will be held regularly or from time to time as required.

Daw Hla Myat Thu

Director

Young Investment Group Industry Co., Ltd

Table – 26: List of commitments

No.	Particulars	Chapter and page
1.	Commitment to comply with laws, rules, regulation, procedure, guideline etc.	Chapter-3, Page – 110
2.	Commitment to implement the project in an ecologically sound, economically viable and socially sustainable way	Chapter-4, Page – 160
3.	Commitment not to cause serious negative impacts on physical, biological, socio-economic, cultural and visual components of the environment	Chapter-5, Page – 210
4.	Commitment to duly take all required mitigation measures effectively	Chapter-6, Page – 265
5.	Commitment not to execute the project resulting in cumulative impacts on the environment as far as possible	Chapter-7, Page – 271
6.	Commitment to implement EMP in a meaningful and effective way and to provide adequate fund for EMP	Chapter-8, Page – 277, 359
7.	Commitment to build good relation with the local community, to heed to all their views, opinions, comments and concerns and tackle all the issues in a friendly way	Chapter-9, Page - 373

10. CONCLUSION AND RECOMMENDATION

This EIA study has been carried out in accordance with the rules, regulations, guidelines and most of all, the format for EIA designated by the Environmental Conservation Department, the Ministry of Environmental Conservation and Forestry (MOECAAF), now the Ministry of Natural Resources and Environmental Conservation (MONREC).

The potential impacts (both negative and positive) have been identified and assessed and the consultant firm, MESAC, has put in place adequate measures, to eradicate or minimize or mitigate the potential negative impacts. The EIA/EMP and MP prescribed will also contribute to the long run effective and successful implementation and operation of the project, the cement business.

However, one can never expect a developmental project devoid of negative impacts. Whenever and wherever a developmental project like limestone quarry and the establishment of large cement plant for the production of cement is implemented there can surely be a more or less impacts on the physical, biological, socio-economic, cultural and visual component of the surrounding environment. This is inevitable.

For the infrastructure development of the nation the production of cement is a must. As limestone is the essential raw material for the manufacturing of cement we have no other option but to extract the limestone. This is the pragmatic way of thinking and pragmatic way of doing thing for national infrastructure development.

If laws, rules and regulation regarding the environment are complied with by the project proponent and if all the Environmental Management Plan are implemented and all the mitigation measures are taken them virtually all the impacts can be mitigated to a great extent.

The project proponent, Young Investment Group Industry Co., Ltd will comply with all the laws, rules and regulation mentioned in this report. The company shall hire a legal expert for dealing and complying with these laws and rules.

The company will also strictly follow the procedures and guideline prescribed by ECD for the operation of the project which will be described in the follow up EIA report. The company will take all the mitigation measures which will be addressed in the follow up EIA report.

The project is considered viable because it is very clear that the benefits will outweigh the manageable negative impacts in many aspects.

The project will bring employment opportunities for hundreds of locals. The project will foster the local economy and eventually contribute to the development of the construction sector of the country, infrastructure of the country, and hence national development.

The project proponent, Young Investment Group Industry Co., Ltd, really believe that the project can be successfully implemented without any serious adverse effect on the environment.

REFERENCES

- 1) ADB. Environmental Assessment guideline, 2003
- 2) Brown, S; Walmsley, B; and Tarr, P. 2006. Guidance Document on Biodiversity Impact Assessment and Decision making in S. Africa. S. Africa Inst. Environ. Assess.
- 3) Chanard, T 2003. A photographic guide to Amphibian in Thailand. Se-education Public Co., Ltd, Thailand, pp.176
- 4) Das, I. 2010. A field guide to the reptiles of Thailand and S.E.Asia. Asia Book Co., Ltd, Thailand, pp 376.
- 5) Environ Planners Ltd.2010. EIA for cement plant and limestone quarry for Cement Jamaica Limited, Jama, 2010.
- 6) Fish.<http://fish.mongabay.com/data/ecosystem/Salween.htm>.
- 7) Frank, D. 2012. Social Impact Assessment of Project Development. Guide for Australian Region.
- 8) Hundly, H.G 1987. List of trees, shrubs, herbs and principal climber etc 4th Revised Ed, Shwe Daw Oo Press, Yangon
- 9) IDB 2011. Environmental Impact Assessment for cement plants
- 10) IFC 2007. Environmental, Health and Safety Guidelines for cement and lime Manufacturing. International France Corporation, world Bank Group.
- 11) IFC 2012.Sustainability Framework: Policy and Performance standards on Environmental and social sustainability (2012).
- 12) Kress, W.J; R.A Deflipps & E. Farr. 2003. A check list of the trees, shrubs, herbs and climbers of Myanmar. Washington D.C.
- 13) MESC. 2015. ESIA for the project to upgrade Max Myanmar cement plant, Taung Philar, Lei-way Township.
- 14) MESC, September, 2015. EIA on Blue Diamond Cement Factory at Pyi Nyaung, Tharzi Township, Mandalay Region.
- 15) MOAI. 2004 Soil types and characteristics of Myanmar. Ministry of Agriculture and Irrigation, Myanmar.
- 16) MOECAP. 2012 Environmental Conservation Law

- 17) MOECAAF (MONREC). 2015. National Environmental Quality (Emission) Guidelines. The Ministry of Environmental Conservation and Forestry, 29-12-2015.
- 18) Environmental Impact Assessment Procedure, Notification No.616/2015, December 2015.
- 19) Report on Regional Geology of Myanmar. Dept. Geological Engineering; faculty of Engineering, Gadjab Mada University, April, 2010.
- 20) Robson, C. 2008. A field guide to the birds of Thailand and S.E. Asia. Asian Book Co., Ltd Thailand.

ANNEX

M0124 026

WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client _____ MESC Co.,Ltd.
 Nature of Water _____ River Water
 Location _____ အဝေတီ၊ စင်္ကြံမြို့နယ်
 Date and Time of collection _____ 18.1.2024
 Date and Time of arrival at Laboratory _____ 19.1.2024
 Date and Time of commencing examination _____ 19.1.2024
 Date and Time of completing _____ 20.1.2024

Results of Water Analysis

**WHO Drinking Water Guideline
 (Geneva - 1993)**

Total Coliform Count	10	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	2	CFU/100ml	Not detected
pH	7.3		6.5 - 8.5
Turbidity	9	NTU	5 NTU
Colour (True)	5	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

*Date & Time Sample Collection Error.

Remark : Unsatisfactory for drinking purpose.

: This certificate is issued only for the receipt of the test sample.

: < - Less than

Tested by

Signature: _____
 Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr.Chemist
ISO Tech Laboratory

Approved by

Signature: _____
 Name: Thinzar Theint Theint
B-E (Civil)
Assistant Technical Officer
ISO Tech Laboratory

(a division of WEG Co., Ltd.)

No.18, Lanthit Road, Nantharhone Quarter, Insein Township, Yangon, Myanmar.
 Ph: 01-640955, 09-880100172, 09-880100173, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

Laboratory Technical Consultant: U Saw Christopher Maung
 B.Sc Engg: (Civil), Dip S.E.(Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001,
 Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

WTL-RE-001
 Issue Date - 01-12-2012
 Effective Date - 01-12-2012
 Issue No - 1.0/Page 1 of 2

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WATER QUALITY TEST RESULTS FORM

Client MESC Co.,Ltd.
 Nature of Water River Water
 Location ၃၄၀၀၀၁၊ စည်ကန်၊ ဝေပုံ၊
 Date and Time of collection 18.1.2024
 Date and Time of arrival at Laboratory 19.1.2024
 Date and Time of commencing examination 20.1.2024
 Date and Time of completing 22.1.2024

Results of Water Analysis

**WHO Drinking Water Guideline
(Geneva - 1993)**

pH			6.5 - 8.5
Colour (True)		TCU	15 TCU
Turbidity		NTU	5 NTU
Conductivity		micro S/cm	
Total Hardness	166	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness		mg/l as CaCO ₃	
Magnesium Hardness		mg/l as CaCO ₃	
Total Alkalinity		mg/l as CaCO ₃	
Phenolphthalein Alkalinity		mg/l as CaCO ₃	
Carbonate (CaCO ₃)		mg/l as CaCO ₃	
Bicarbonate (HCO ₃)		mg/l as CaCO ₃	
Iron	0.33	mg/l	0.3 mg/l
Chloride (as CL)	3	mg/l	250 mg/l
Sodium Chloride (as NaCL)		mg/l	
Sulphate (as SO ₄)	8	mg/l	500 mg/l
Total Solids		mg/l	1500 mg/l
Total Suspended Solids		mg/l	
Total Dissolved Solids	173	mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate		mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by
 Signature: Zaw Hein Oo
 Name: B.Sc (Chemistry)
Sr.Chemist

Approved by
 Signature: Thinzar Theint Theint
 Name: B.E (Civil)
Assistant Technical Officer
ISO Tech Laboratory

(a division of WEG Co., Ltd.) **ISO Tech Laboratory**

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 Ph: 01-640955, 09-880100172, 09-880100173, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

W0124 428

WATER QUALITY TEST RESULTS FORM

Client _____ MESC Co.,Ltd. _____
 Nature of Water _____ River Water _____
 Location _____ ဒဂုန်မြို့၊ စင်္ကြံမြစ် _____
 Date and Time of collection _____ 18.1.2024 _____
 Date and Time of arrival at Laboratory _____ 19.1.2024 _____
 Date and Time of commencing examination _____ 20.1.2024 _____
 Date and Time of completing _____ 22.1.2024 _____

Results of Water Analysis

**WHO Drinking Water Guideline
 (Geneva - 1993)**

Temperature (°C)		°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)		mg/l	0.01 mg/l
Arsenic (As)	Nil	mg/l	0.01 mg/l
Nitrate (N.NO ₃)	0.5	mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia Nitrogen (NH ₃)		mg/l	
Ammonium Nitrogen (NH ₄)		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)		mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)		mg/l	
Cyanide (CN)		mg/l	0.07 mg/l
Zinc (Zn)		mg/l	3 mg/l
Copper (Cu)		mg/l	2 mg/l
Silica (SiO ₂)		mg/l	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature: _____
 Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr.Chemist
ISO Tech Laboratory

Approved by

Signature: _____
 Name: Thinzar Theint Theint
B.E (Civil)
Assistant Technical Officer
ISO Tech Laboratory

(a division of WEG Co., Ltd.)

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M0124 025

WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client _____ MESC Co.,Ltd. _____
 Nature of Water _____ Tube Well Water _____
 Location _____ နတ်ရေကန်ကျေးရွာ၊ စဉ့်ကိုင်မြို့။ _____
 Date and Time of collection _____ 18.1.2024 _____
 Date and Time of arrival at Laboratory _____ 19.1.2024 _____
 Date and Time of commencing examination _____ 19.1.2024 _____
 Date and Time of completing _____ 20.1.2024 _____

Results of Water Analysis

**WHO Drinking Water Guideline
(Geneva - 1993)**

Total Coliform Count	4	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	Not detected (<1)	CFU/100ml	Not detected
pH	7.4		6.5 - 8.5
Turbidity	5	NTU	5 NTU
Colour (True)	Nil	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

*Date & Time Sample Collection Error.

Remark : Unsatisfactory for drinking purpose.

: This certificate is issued only for the receipt of the test sample.

: < - Less than

Tested by

Signature: _____
 Name: **Zaw Hein Oo**
B.Sc (Chemistry)
Sr. Chemist
ISO Tech Laboratory

Approved by

Signature: _____
 Name: **Thinzar Theint Theint**
B.E (Civil)
Assistant Technical Officer
ISO Tech Laboratory

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W0124 427

WATER QUALITY TEST RESULTS FORM

Client MESC Co., Ltd.
 Nature of Water Tube Well Water
 Location နဝရကမေ့မေ့ရွာ စတုကွန်ဂျီ
 Date and Time of collection 18.1.2024
 Date and Time of arrival at Laboratory 19.1.2024
 Date and Time of commencing examination 20.1.2024
 Date and Time of completing 22.1.2024

Results of Water Analysis

**WHO Drinking Water Guideline
(Geneva - 1993)**

pH			6.5 - 8.5
Colour (True)		TCU	15 TCU
Turbidity		NTU	5 NTU
Conductivity		micro S/cm	
Total Hardness	376	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness		mg/l as CaCO ₃	
Magnesium Hardness		mg/l as CaCO ₃	
Total Alkalinity		mg/l as CaCO ₃	
Phenolphthalein Alkalinity		mg/l as CaCO ₃	
Carbonate (CaCO ₃)		mg/l as CaCO ₃	
Bicarbonate (HCO ₃)		mg/l as CaCO ₃	
Iron	0.36	mg/l	0.3 mg/l
Chloride (as CL)	10	mg/l	250 mg/l
Sodium Chloride (as NaCL)		mg/l	
Sulphate (as SO ₄)	10	mg/l	500 mg/l
Total Solids		mg/l	1500 mg/l
Total Suspended Solids		mg/l	
Total Dissolved Solids	361	mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate		mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by
 Signature: Zaw Hein Oo
 Name: B.Sc (Chemistry)
Sr.Chemist

Approved by
 Signature: Thinzar Theint Theint
 Name: B.E (Civil)
Assistant Technical Officer
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W0124 427

WATER QUALITY TEST RESULTS FORM

Client	MESC Co.,Ltd.
Nature of Water	Tube Well Water
Location	နတ်ရေကန်ကေးရာ၊ စင်္ကြံ(၆)။
Date and Time of collection	18.1.2024
Date and Time of arrival at Laboratory	19.1.2024
Date and Time of commencing examination	20.1.2024
Date and Time of completing	22.1.2024

Results of Water Analysis

**WHO Drinking Water Guideline
(Geneva - 1993)**

Parameter	Unit	Value	Guideline (mg/l)
Temperature (°C)	°C		
Fluoride (F)	mg/l		1.5 mg/l
Lead (as Pb)	mg/l		0.01 mg/l
Arsenic (As)	mg/l	Nil	0.01 mg/l
Nitrate (N.NO ₃)	mg/l	0.4	50 mg/l
Chlorine (Residual)	mg/l		
Ammonia Nitrogen (NH ₃)	mg/l		
Ammonium Nitrogen (NH ₄)	mg/l		
Dissolved Oxygen (DO)	mg/l		
Chemical Oxygen Demand (COD)	mg/l		
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	mg/l		
Cyanide (CN)	mg/l		0.07 mg/l
Zinc (Zn)	mg/l		3 mg/l
Copper (Cu)	mg/l		2 mg/l
Silica (SiO ₂)	mg/l		

Remark: This certificate is issued only for the receipt of the test sample.

Tested by
Signature:
Name: **Zaw Hein Oo**
B.Sc (Chemistry)
Sr.Chemist
ISO Tech Laboratory

Approved by
Signature:
Name: **Thinzar Theint Theint**
B.E (Civil)
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LABORATORY



Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg: (Civil), Dip S.E(Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001,
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Issue No - 1.0/Page 1 of 1

M0124 024

WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client MESC Co.,Ltd.
 Nature of Water Tube Well Water
 Location ကန်တွင်းကျေးရွာ၊ စင်္ကြာမြို့
 Date and Time of collection 18.1.2024
 Date and Time of arrival at Laboratory 19.1.2024
 Date and Time of commencing examination 19.1.2024
 Date and Time of completing 20.1.2024

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

Total Coliform Count	2	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	Not detected (<1)	CFU/100ml	Not detected
pH	7.3		6.5 - 8.5
Turbidity	2	NTU	5 NTU
Colour (True)	Nil	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

*Date & Time Sample Collection Error.

Remark : Unsatisfactory for drinking purpose.

: This certificate is issued only for the receipt of the test sample.

: < - Less than

Tested by

Signature:

Name:

Zaw Hein Oo
B.Sc (Chemistry)
Sr.Chemist
ISO Tech Laboratory

Approved by

Signature:

Name:

Thinzar Theint Theint
B.E (Civil)
Assistant Technical Officer
ISO Tech Laboratory

(a division of WEG Co., Ltd.)

No.18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.

Ph: 01-640955, 09-880100172, 09-880100173, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

W0124 426

WATER QUALITY TEST RESULTS FORM

Client MESC Co.,Ltd.
 Nature of Water Tube Well Water
 Location ကန်တွင်းကျေးရွာ စင်္ကြံမြို့
 Date and Time of collection 18.1.2024
 Date and Time of arrival at Laboratory 19.1.2024
 Date and Time of commencing examination 20.1.2024
 Date and Time of completing 22.1.2024

Results of Water Analysis

**WHO Drinking Water Guideline
(Geneva - 1993)**

pH			6.5 - 8.5
Colour (True)		TCU	15 TCU
Turbidity		NTU	5 NTU
Conductivity		micro S/cm	
Total Hardness	316	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness		mg/l as CaCO ₃	
Magnesium Hardness		mg/l as CaCO ₃	
Total Alkalinity		mg/l as CaCO ₃	
Phenolphthalein Alkalinity		mg/l as CaCO ₃	
Carbonate (CaCO ₃)		mg/l as CaCO ₃	
Bicarbonate (HCO ₃)		mg/l as CaCO ₃	
Iron	0.25	mg/l	0.3 mg/l
Chloride (as CL)	5	mg/l	250 mg/l
Sodium Chloride (as NaCL)		mg/l	
Sulphate (as SO ₄)	12	mg/l	500 mg/l
Total Solids		mg/l	1500 mg/l
Total Suspended Solids		mg/l	
Total Dissolved Solids	385	mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate		mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity		ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by *Hein*
 Signature: Zaw Hein Oo
 Name: B.Sc (Chemistry)
Sr.Chemist

Approved by *Hein*
 Signature: Thinzar Theint Theint
 Name: B.E (Civil)
Assistant Technical Officer
ISO Tech Laboratory

(a division of WEG Co., Ltd.) **ISO Tech Laboratory**

No.18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
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LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg (Civil), Dip S.E(Deff) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001,
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)



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WATER QUALITY TEST RESULTS FORM

Client	MESC Co.,Ltd.
Nature of Water	Tube Well Water
Location	ကန်တွင်းကျေးရွာ၊ စဉ့်ကိုင်မြို့။
Date and Time of collection	18.1.2024
Date and Time of arrival at Laboratory	19.1.2024
Date and Time of commencing examination	20.1.2024
Date and Time of completing	22.1.2024

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

Parameter	Result	Unit	Guideline
Temperature (°C)		°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)		mg/l	0.01 mg/l
Arsenic (As)	Nil	mg/l	0.01 mg/l
Nitrate (N.NO ₃)	0.7	mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia Nitrogen (NH ₃)		mg/l	
Ammonium Nitrogen (NH ₄)		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)		mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)		mg/l	
Cyanide (CN)		mg/l	0.07 mg/l
Zinc (Zn)		mg/l	3 mg/l
Copper (Cu)		mg/l	2 mg/l
Silica (SiO ₂)		mg/l	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature:

Name: **Zaw Hein Oo**
B.Sc (Chemistry)
Sr.Chemist
ISO Tech Laboratory

Approved by

Signature:

Name: **Thinzar Theint Theint**
B.E (Civil)
Assistant Technical Officer
ISO Tech Laboratory

(a division of WEG Co., Ltd.)

No.18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
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DEPARTMENT OF AGRICULTURE (LAND USE)
 WATER ANALYTICAL DATA SHEET
 MESC (19.1.2024)


Division - မန္တလေးတိုင်းဒေသကြီး။

Sheet No. 3

Township - စဉ့်ကိုင်မြို့နယ်။

Sr No. W - 1 - 3 /2024

Sr No.	Sample	Lead (Pb) ppm
1	ကန်တွင်းကျေးရွာ	0.04
2	နတ်ရေကန်ကျေးရွာ	0.07
3	ဒုဋ္ဌဝတီမြစ်ရေ	0.02


 (ဒေါက်တာသန္တာညီ)
 ဒုတိယညွှန်ကြားရေးမှူး
 ဓာတ်ခွဲခန်းတာဝန်ခံ
 မြေအသုံးချရေးဌာနခွဲ

DEPARTMENT OF AGRICULTURE (LAND USE)
SOIL INTERPRETATION OF RESULTS

MESC (19.1.2024)


Division - မန္တလေးတိုင်းဒေသကြီး။

Sheet No. 2

Township - စည်ကိုင်မြို့နယ်။

Sr No. S 1-3 / 2024

Sr No.	Sample	pH Soil:Water 1:2.5	Texttrure	Total N	Available Nutrients
					P
1	ကန်တွင်းကျေးရွာ	Moderately Alkaline	Sandy Clay Loam	Low	Very High
2	နတ်ရေကန်ကျေးရွာ	Moderately Alkaline	Sandy Loam	Medium	Low
3	Project Site	Moderately Alkaline	Sandy Loam	Medium	Low


 (ဒေါက်တာသန္တာညီ)
 ဒုတိယညွှန်ကြားရေးမှူး
 ဓာတ်ခွဲခန်းတာဝန်ခံ
 မြေအသုံးချရေးဌာနခွဲ

DEPARTMENT OF AGRICULTURE (LAND USE)
SOIL ANALYTICAL DATA SHEET
MESC (23.8.2023)

Division - မန္တလေးတိုင်းဒေသကြီး။


Sheet No. 1

Township - စဉ့်ကိုင်မြို့နယ်။

Sr No. S - 1 - 3 / 2024

Sr No.	Sample	Moisture %	pH Soil:Water 1:2.5	Texture				Total N %	Available Nutrients
				Sand %	Silt %	Clay %	Total %		P (ppm) (O)
1	ကန်တွင်းကျေးရွာ	3.11	8.02	59.88	19.86	20.26	100	0.144	52.84
2	နတ်ရေကန်ကျေးရွာ	3.09	8.05	65.88	18.86	15.26	100	0.288	4.54
3	Project Site	4.12	8.02	60.88	27.86	11.26	100	0.273	5.42

O= Olsen Method


 (ဒေါက်တာသန္တာညီ)
 ဒုတိယညွှန်ကြားရေးမှူး
 ဓာတ်ခွဲခန်းတာဝန်ခံ
 မြေအသုံးချရေးဌာနခွဲ



တက်လှောင်းနှီးမြှုပ်နှံမှုအဖွဲ့ စက်မှုထုတ်လုပ်မှုကုမ္ပဏီလီမိတက်
မန္တလေးတိုင်းဒေသကြီး၊ ကျောက်ဆည်ခရိုင်၊ ကျောက်ဆည်မြို့နယ်၊ သရက်ပင်ကျေးရွာအုပ်စု
လူမှုစီးပွားရေးဘဝ ဖွံ့ဖြိုးတိုးတက်ရေးဆောင်ရွက်ပေးနိုင်မှုစာရင်း

စဉ်	ရက်စွဲ	အကြောင်းအရာ	ဇနရာ	လွှဲဒါန်းငွေ
၁	၂၃.၁၁.၂၀၁၆	ကျေးရွာလျှပ်စစ်မီးလင်းရေး	မန္တလေးတိုင်းဒေသကြီး၊ စဉ့်ကိုင်မြို့နယ်၊ မီးသွေးဘုတ်အုပ်စု၊ နတ်ရေကန်ကျေးရွာ။	၂,၀၀၀,၀၀၀
၂	၉.၄.၂၀၁၈	ဘာသာရေး၊ ပညာရေး၊ စီးပွားရေးနှင့် လူမှုရေးလုပ်ငန်းများတွင် အသုံးပြုရန်။	ကန်တွင်းကျေးရွာ၊ မီးသွေးဘုတ်ကျေးရွာအုပ်စု၊ စဉ့်ကိုင်မြို့နယ်။	၁၁,၁၀၀,၀၀၀
၃	၉.၄.၂၀၁၈	ဘာသာရေး၊ ပညာရေး၊ စီးပွားရေးနှင့် လူမှုရေးလုပ်ငန်းများတွင် အသုံးပြုရန်။	ကန်တွင်းကျေးရွာ၊ မီးသွေးဘုတ်ကျေးရွာအုပ်စု၊ စဉ့်ကိုင်မြို့နယ်။	၄၀,၀၀၀,၀၀၀
၄	၁၃.၄.၂၀၁၈	ဘာသာရေး၊ ပညာရေး၊ လုပ်ငန်းများတွင် အသုံးပြုရန်။	နတ်ရေကန်ကျေးရွာ၊ မီးသွေးဘုတ်ကျေးရွာ အုပ်စု၊ စဉ့်ကိုင်မြို့နယ်။	၆,၅၀၀,၀၀၀
၅	၂.၆.၂၀၁၈	အခြေခံပညာအလယ်တန်းကျောင်း၊ ၂၀၁၈-၂၀၁၉ ပညာသင်နှစ် အတွက် စာသင်ခုံ (၅၀) လုံး၊ ကုလားထိုင် (၃၀) လုံး၊ ဝိုက်ဘတ် (၃) ချပ်၊ စာအုပ်စင် (၂) စင် လွှဲဒါန်းခြင်း။	နတ်ရေကန်ကျေးရွာ၊ မီးသွေးဘုတ်ကျေးရွာ အုပ်စု၊ စဉ့်ကိုင်မြို့နယ်။	၅၀၀,၀၀၀
၆	၁၄.၁၁.၂၀၂၃	ပညာလက်ကားရသသကျွမ်းကျင်ရေးအလှူငွေ တည်ဆောက်ရေးအလှူငွေ	ရွာဦးကျောင်းတိုက်၊ နတ်ရေကန်ကျေးရွာ၊ မီးသွေးဘုတ်ကျေးရွာအုပ်စု၊ စဉ့်ကိုင်မြို့နယ်။	၁၀,၀၀၀,၀၀၀
စုစုပေါင်း				၇၀,၁၀၀,၀၀၀

(ပထမအကြိမ်) (၂၀-၃-၂၀၁၄) နတ်ရေကန်ကျေးရွာ

အကျဉ်းချုပ်

ရက်စွဲ ၂၀၁၃ ခုနှစ် ၂၂ ရက်

အကြောင်းအရာ

၁။ အကျဉ်းချုပ်

၂။ အကျဉ်းချုပ်

စဉ်	အမျိုးအမည်	ရက်စွဲ	အကြောင်းအရာ	အကျဉ်းချုပ်
၁	စိုက်ပျိုးရေး	၂၀၁၃/၂၄
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၅
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စဉ်	အမျိုးအမည်	ရက်စွဲ	အကြောင်းအရာ	အကျဉ်းချုပ်
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ရက်စွဲ ၂၀၁၃ ခုနှစ် ၂၂ ရက်

အကြောင်းအရာ

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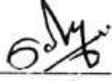




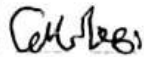
၉၇။ အကျဉ်းချုပ်

၉၈။ အကျဉ်းချုပ်

၉၉။ အကျဉ်းချုပ်

၁၀၀။ အကျဉ်းချုပ်




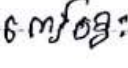
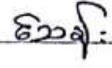



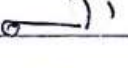



အမည်အဝေးတက်ရောက်သူများစာရင်း

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၁	ဦး ကံ စ		
၂	။ ကံ တင်		
၃	။ ဘေးဇီး ဓမ္မ		
၄	။ ပေါ်ဆွေ		
၅	။ ခန့် မြစ်		
၆	။ ဝင်း မြစ်	ဝင်းမြစ်	
၇	။ သန့် သွန်		
၈	။ စိုး ဝေ		
၉	။ ဘဏိုက်		
၁၀	။ ဘေးဇီး ဓမ္မ		

ကျေးရွာအမည်-ရွာယုံအို(ကျေးရွာ)

နေ့စွဲ-30-7-2017














အစည်းအဝေးတက်ရောက်သူများစာရင်း

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၁	ဦးရွှေဆောင်		
၂	မိုးလင်းဌေး		
၃	ဦးစည်		
၄	ကျော်စွာ		
၅	ကျော်စွာ		
၆	ကျော်စွာ		
၇	ကျော်စွာ		
၈	ကျော်စွာ		
၉	ကျော်စွာ		
၁၀	ကျော်စွာ		
၁၁	ကျော်စွာ		
၁၂	ကျော်စွာ		
၁၃	ကျော်စွာ		

Young Investment Group Industry Co., Ltd မှ တစ်ရက်လျှင် သိလပ်မြေတန်ချိန် (၅၀၀၀) နှစ်လိုင်း
 စီမံကိန်းတည်ဆောက်ခြင်းနှင့်လည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ
 (EIA) တောင်ရွက်ရန် အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးဇူးတင်အပ်သည် ~~အစည်းအဝေး~~...

နေ့စွဲ 18.1.2024

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၁-	ဦးကံခ		အုပ်ချုပ်ရေးမှူး (ပုသိမ်မြို့နယ်)
၂-	ဦးစက်လင်း		(ကျေးဇူး)
၃-	" မေမိမာမိ		
၄-	မေ ရှင်မာ		
၅-	မ ခင် မြ		
၆-	ဦး ပေါ်ဆွေ		
၇-	ဦး စမာမိခိုင်		
၈-	" ကိုလင်း		
၉-	" မောင်ချော်		
၁၀-	" စိန်မာမိ		
၁၁-	" သန်းချုပ်		
၁၂-	မေ နီ		
၁၃-	မေ ရှိ		

Young Investment Group Industry Co., Ltd မှ တစ်ရက်လျှင် ဘီလစ်မြေတန်ချိန် (၅၀၀၀) နှစ်လိုင်း
 စီမံကိန်းတည်ဆောက်ခြင်းနှင့်လည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ
 (EIA) ဆောင်ရွက်ရန် အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးရာအမည် ~~အမည်~~ -

နေ့စွဲ 18.1.2024

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၁၄	ဦး မိုးမင်္ဂလာ	၅၈	
၁၅	မောင် စု	၅၉	
၁၆	ဦးကျော်မင်း	၆၀	
၁၇	မောင် မာမာ	၆၁	
၁၈	ဦးမင်းမင်း	၆၂	
၁၉	ဦးသိန်းဇော်	၆၃	
၂၀	ဦးကျော်မင်း	၆၄	
၂၁	ဦးစိုးမင်း	၆၅	
၂၂	ဦးစိုးမင်း	၆၆	
၂၃	ဦးကျော်မင်း	၆၇	
၂၄	ဦးကျော်မင်း	၆၈	
၂၅	ဦးစိုးမင်း	၆၉	
၂၆	ဦးစိုးမင်း	X	

Young Investment Group Industry Co., Ltd မှ တစ်ရက်လျှင် ဘီလပ်မြေတန်ချိန် (၅၀၀၀)
 နှစ်လိုင်း စီမံကိန်းတည်ဆောက်ခြင်းနှင့်လည်ပတ်ခြင်းလုပ်ငန်းအတွက်
 ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ (EIA) ဆောင်ရွက်ရန်
 အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးရွာအမည် အင်အေး

နေ့စွဲ 18.1.2024

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၂၇.	ခေါ်ကြည့်ခွင့်	ဓမ္မ	
၂၈.	။ စိန်ဖြူ	စိန်	
၂၉.	။ တင်အုံး	တင်	
၃၀.	။ ဘန်နိုး	ဘန်	
၃၁.	။ စန္ဒာဝင်း	ဝင်း	
၃၂.	လှိုင်ချစ်	ချစ်	
၃၃.	မာဝန်းလွင်	လွင်	
၃၄.	မခင်သိုင်း	သိုင်း	
၃၅.	ဦးမောင်လွင်	လွင်	
၃၆.	။ မောင်ခေတ္တ	ခေတ္တ	
၃၇.	မခင်ပါယလ်လွင်	လွင်	
၃၈.	ဦးတုတ်	တုတ်	
၃၉.	။ နိုင်စွာ	စွာ	

Young Investment Group Industry Co., Ltd မှ တစ်ရက်လျှင် ဘီလင်မြေတန်ချိန် (၅၀၀၀)
 နှစ်လိုင်း စီမံကိန်းတည်ဆောက်ခြင်းနှင့်လည်ပတ်ခြင်းလုပ်ငန်းအတွက်
 ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ (EIA) ဆောင်ရွက်ရန်
 အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးရွာအမည် အင်အာဂျီ



နေ့စွဲ 18.1.2024

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၄၀	မအိမြေ		
၄၁	မအုံး		
၄၂	စိုးစိုးစိုး		
၄၃	စိုးစိုးစိုး		
၄၄	ဦးကျော်စိုး		
၄၅	ဦးကျော်စိုး		
၄၆	ဦးစင်စင်		
၄၇	ဦးကျော်စိုး		
၄၈	ဦးကျော်စိုး		
၄၉	ဦးကျော်စိုး		
၅၀	ဦးကျော်စိုး		
၅၁	ဦးကျော်စိုး		
၅၂	ဦးကျော်စိုး		

Young Investment Group Industry Co., Ltd မှ တစ်ရက်လျှင် ဘီလင်မြေတန်ချိန် (၅၀၀၀)
 နှစ်လိုင်း စီမံကိန်းတည်ဆောက်ခြင်းနှင့်လည်ပတ်ခြင်းလုပ်ငန်းအတွက်
 ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ (EIA) ဆောင်ရွက်ရန်
 အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးရွာအမည် နယ်ချောင်း ---

နေ့စွဲ 18.1.2024














စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၅၃။	ဦးတင် ဗျို		
၅၄။	ဦးယင်လေး		
၅၅။	ဦးသန်းဆန်း		
၅၆။	ဦးမျိုးကျော်စွန်		
၅၇။	ဦးကျော်စင်		
၅၈။	ဦးစိုင်းအိဟ		
၅၉။	ဦးသန်းမင်းသူ		
၆၀။	ဦးဝေလင်းအောင်		
၆၁။	ဦးခိုင်စိုး		
၆၂။	ဦးကျော်စင်		
၆၃။	ဦးကျော်စေ		

Young Investment Group Industry Co., Ltd မှ တစ်ရက်လျှင် ဘီလပ်မြေတန်ချိန် (၅၀၀၀) နှစ်လိုင်း
 စီမံကိန်းတည်ဆောက်ခြင်းနှင့်လည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ
 (EIA) ဆောင်ရွက်ရန် အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးဇူးတင်အမည်

ကျေးဇူးတင်

နေ့စွဲ 18.1.2024

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၁။	ဦးမောင်သိန်း		အုပ်ချုပ်ရေးမှူး (ဇန်နဝါရီလ)
၂။	ဦးစိုးစိုး		(ဇန်နဝါရီလ)
၃။	ဦးကျော်မင်းထွန်း		
၄။	ဦးမောင်မောင်		
၅။	ဦးကျော်စွာ		
၆။	ဦးသိန်းစိန်		
၇။	ဦးမောင်မောင်		
၈။	ဦးဇော်စိန်		
၉။	ဦးမောင်မောင်		
၁၀။	ဦးကျော်စွာ		
၁၁။	ဦးမောင်မောင်		
၁၂။	ဦးစိုးစိုး		
၁၃။	ဦးမောင်မောင်		

Young Investment Group Industry Co., Ltd မှ တစ်ရက်လျှင် ဘီလပ်မြေတန်ချိန် (၅၀၀၀)

နှစ်လိုင်း စီမံကိန်းတည်ဆောက်ခြင်းနှင့်လည်ပတ်ခြင်းလုပ်ငန်းအတွက်

ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ (EIA) ဆောင်ရွက်ရန်

အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးရွာအမည်

နေရာ:

နေ့စွဲ 18.1.2024

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၁၄	ဦး စိန်ဝင်း	စိန်ဝင်း	
၁၅	။ ချစ်စော	စော	
၁၆	။ မိမိ	မိမိ	
၁၇	။ ယောင် ဝိဇ္ဇာ	ယောင် ဝိဇ္ဇာ	
၁၈	။ ဇော် မင်း	ဇော်	
၁၉	။ မင်း လွင်	မင်း	
၂၀	။ ဇော်စောဝင်း	ဇော်	
၂၁	။ မိုး ရှိ	မိုး	
၂၂	။ ဇော် ဖုတ် ရှိ	ဖုတ်	
၂၃	။ မိုးမောင်	မင်း	
၂၄	။ ဇော် နိုင် ဇော်	ဇော်	
၂၅	။ ဇော် ရှိ	ဇော်	
၂၆	။ ဇော်စော	ဇော်	

Young Investment Group Industry Co., Ltd မှ တစ်ရက်လျှင် ဘိလပ်မြေတန်ချိန် (၅၀၀၀) နှစ်လိုင်း
 စီမံကိန်းတည်ဆောက်ခြင်းနှင့်လည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ
 (EIA) ဆောင်ရွက်ရန် အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးဇူးအမည် ... ကန့်သတ်

နေ့စွဲ 18.1.2024

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၂၇	ဦး ချို သန်း	၁၁၉	
၂၈	ဦး အောင်	၁၂၀	
၂၉	ဦး မောင်	၁၂၁	
၃၀	ဦး သိန်းဇွဲ	၁၂၂	
၃၁	ဦး ပိုင်စွယ်	၁၂၃	
၃၂	ဦး မြတ်စိန်	၁၂၄	
၃၃	ဦး မိုးမိုး	၁၂၅	
၃၄	ဦး ဦး	၁၂၆	
၃၅	ဦး စိုး	၁၂၇	
၃၆	ဦး အောင်	၁၂၈	
၃၇	ဦး မောင်	၁၂၉	
၃၈	ဦး မိုးမိုး	၁၃၀	
၃၉	ဦး ဦး	၁၃၁	

Young Investment Group Industry Co., Ltd မှ တစ်ရက်လျှင် ဘီလပ်မြေတန်ချိန် (၅၀၀၀) နှစ်လိုင်း
စီမံကိန်းတည်ဆောက်ခြင်းနှင့်လည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ
(EIA) ဆောင်ရွက်ရန် အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးရွာအမည်

ဆီလွှဲ

နေ့စွဲ ၂၀၂၁.၁.၂၀.၂၅

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၄၀	ကျ ခင် မှု	၆	
၄၁	ကျ နိုး ဗျစ်	၈	
၄၂	ကျ ကုမ္ပဏီ	၁၄	
၄၃	ကျ မြင့်မတ်	၆	
၄၄	ဦး စွေဆောင်	၆	
၄၅	ဦး နိုးဆောင်	၆	
၄၆	ကျ ဝင်းကျိ	၀၉	
၄၇	ကျ နိုင်	၁၅	
၄၈	ကျ ဝင်းကျိ	၅	
၄၉	ဦး စွေ	၇	
၅၀	ဦး ဝင်းကျိ	၅	
၅၁	ဦး နိုးကျိ	၆	
၅၂	ဦး မောင်ကျိ	၆	

Young Investment Group Industry Co., Ltd မှ တစ်ရက်လျှင် ဘိလပ်မြေတန်ချိန် (၅၀၀၀) နှစ်လိုင်း စီမံကိန်းတည်ဆောက်ခြင်းနှင့်လည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ (EIA) ဆောင်ရွက်ရန် အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးဇူးအမည်

ဆီလီယံ

နေ့စွဲ 18.1.2024

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၅၃	ဦးကျော်သိန်းဇော်	ဇော်	
၅၄	ကျော်ပေါ်ဇော်	ပေါ်	
၅၅	ဦးဝင်း	ဝင်း	
၅၆	ဦးစာဖတ်ဝင်း	စာဖတ်	
၅၇	ဦးဖိုးစာ	ဖိုး	
၅၈	ကျော်သိန်းစာ	သိ	
၅၉	ကျော်စိန်မာ	စိန်	
၆၀	ဦးညိုစော	ညို	
၆၁	ဦးရွှေစာ	ရွှေ	
၆၂	ကျော်စောမာ	စော	
၆၃	ကျော်စိန်စော	စိန်	
၆၄	ဦးကျော်စိန်	ကျော်	
၆၅	ကျော်စိန်မာ	စိန်	

Young Investment Group Industry Co., Ltd မှ တစ်ရက်လျှင် ဘီလင်မြေတန်ချိန် (၅၀၀၀) နှစ်လိုင်း
 စီမံကိန်းကည်ဆောက်ခြင်းနှင့်လည်ပတ်ခြင်းလုပ်ငန်းအတွက် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ
 (EIA) ဆောင်ရွက်ရန် အစည်းအဝေးတက်ရောက်သူများစာရင်း

ကျေးဇူးတင်မည်

အရိပ်စွဲ

နေ့စွဲ 18.1.2024

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၆၆	ဦး ဇေယျာ များ	ဇေယျာ	
၆၇	ဦး စာင်အယ်	စာင်	
၆၈	ဦး ဇော်စိန်	ဇော်	
၆၉	ဦး ဇော်	ဇော်	
၇၀	ဦး စာင်စော	စာင်	
၇၁	ဦး ဇော်	ဇော်	
၇၂	ဦး စာင်ဦး	စာင်	
၇၃	ဦး အောင်စွယ်	အောင်	
၇၄	ဦး စာင်	စာင်	
၇၅	ဦး ခင်မောင်မောင်	မောင်	
၇၆	ဦး စိန်	စိန်	
၇၇	ဦး မောင်ဇော်	ဇော်	
၇၈	ဦး မောင်	မောင်	



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