INITIAL ENVIRONMENTAL EXAMINATION FOR CONSTRUCTION OF 230 KV POWER TRANSMISSION LINE (SECTION – II)

Proposed by

AUNG MYINT MO CO., LTD.

Aung Myint Mo Company Limited

Revise (01)

December, 2017

Prepared by

E Guard Environmental Services Company Limited

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CURRENCY EQUIVALENTS

In this report, "$" refers to United States dollar.

(as of 1 Jan 2015)

Currency Unit	–	Kyat
MMK1.00	=	$0.000986
$1.00	=	1013.53

ABBREVIATIONS

ADB:	Asian Development Bank
AH:	Affected Household
BOD:	Biochemical Oxygen Demand
COD:	Chemical Oxygen Demand
EMF:	Electromagnetic Field
EIA:	Environment Impact Assessment
EMP:	Environment Management Plan
EO:	Environmental Officer
EA:	Executing Agency
GRM:	Grievance Redress Mechanism
IA:	Implementing Agency
IEE:	Initial Environmental Examination
DPTSC	Department of Power Transmission and System Control
MONREC:	Ministry of Natural Resource and Environmental Conservation
MOEE	Ministry of Electricity and Energy
ROW:	Right-of-way
PIC:	Project Implementation Consultant
PIU:	Project Implementation Unit
SPS:	ADB Safeguard Policy Statement
TSS:	Total Suspended Solids

WEIGHTS AND MEASURES

^{o}C	–	Celsius
km	–	kilometer
kV	–	kilovolt
kWh	–	kilowatt-hour
LV	–	low voltage
m	–	meter
mm	–	millimeter
mm/kV	–	millimeter per kilovolt

အစီရင်ခံစာ အကျဉ်းချုပ်

မြန်မာနိုင်ငံသည် လျှပ်စစ်ဓါတ်အား လုံလောက်အောင် ထုတ်လုပ်နိုင်စွမ်း မရှိခဲ့ခြင်းကြောင့် မကြာခဏ လျှပ်စစ်ပြတ်တောက်မှုများ၊ ကာလရှည်ကြာစွာ လျှပ်စစ်ဖြတ်တောက်ခံရမှုများကို ကြုံတွေ့နေခဲ့ရသည်မှာ နှစ်ပေါင်းအတော်ကြာပြီဖြစ်ပါသည်။ အကျိုးဆက်အားဖြင့် တိုင်းပြည်၏ စီးပွားရေးကဏ္ဍများ တိုးတက်မှု၊ နိုင်ငံသားတို့၏လူနေမှုဘဝ အဆင့်အတန်းနှင့် အခြားသော ကဏ္ဍများ တိုးတက်မှုတို့အတွက် ကြီးစွာသော အဟန့်အတားဖြစ်စေခဲ့ပါသည်။

ထိုသို့ လျှပ်စစ်မတ်အားမလုံလောက်မှုအခက်အခဲကို ကျော်လွှားနိုင်ရန်အတွက် လျှပ်စစ်စွမ်းအား ဝန်ကြီးဌာနအနေဖြင့် နိုင်ငံရပ်ခြားငွေကြေးဆိုင်ရာ အဖွဲ့အစည်းများ၊ စီမံကိန်းဆောင်ရွက်သူများနှင့် တိုင်ပင်ညှိနှိုင်း၍ လျှပ်စစ်မတ်အားထုတ်လုပ်ခြင်း၊ ပေးပို့သွယ်တန်းခြင်း၊ ပြန်လည်ဖြန့်ဖြူးခြင်း၊ ရှိရင်းစွဲမတ်အားပေးစက်ရုံများမှ ဓါတ်အားလိုင်းများကို အဆင့်မြှင့်တင်ခြင်း၊ ပြန်လည်ပြည့်ဖြိုးမြဲ စွမ်းအင်ရင်းမြစ်များ ရှာဖွေခြင်းနှင့် အခြားသောလျှပ်စစ်စွမ်းအားရင်းမြစ်များ ရှာဖွေခြင်းတို့ကို စီမံဆောင်ရွက်လျက်ရှိပါသည်။

ဤ ၂၃၀ ကေဗွီ မဟာမတ်အားလိုင်း သွယ်တန်းခြင်းစီမံကိန်းကို မြန်မာနိုင်ငံ ရှမ်းပြည်နယ် အရှေ့ပိုင်း၏ မဟာမတ်အားလိုင်းစွမ်းအင်မြှင့်တင်ရန် ရည်ရွယ်ချက်များအရ ရှမ်းပြည်နယ် အရှေ့ပိုင်း၏ အရေးပါလှသော အခြေခံစီမံကိန်းအဖြစ် ရွေးချယ်ခဲ့ပါသည်။ ထို့အပြင် ဤစီမံကိန်းသည် ရှမ်းပြည်နယ် အရှေ့ပိုင်းအတွက် အမြောက်အများလိုအပ်နေသော လျှပ်စစ်မတ်အားများကို ဖြည့်တင်းပေးရန် အဓိက အခန်းကဏ္ဍမှ ပါဝင်မည် ဖြစ်ပါသည်။

၂၃၀ ကေဗွီ မဟာမတ်အားလိုင်းစီမံကိန်းအပိုင်း (၂) အတွက် လျှပ်စစ်စွမ်းအင်ဝန်ကြီးဌာနမှ ရှမ်းပြည်နယ်တွင် မတ်အားခွဲရုံ ၂ခု တည်ဆောက်ရန် အစီအစဉ်ရေးဆွဲခဲ့ပါသည်။

မြန်မာနိုင်ငံ၏ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေအရ ဤစီမံကိန်းသည် မဟာ မတ်အား လိုင်းသွယ်တန်းရန်အတွက် ကနဦးပတ်ဂန်းကျင်ဆန်းစစ်ခြင်း အစီရင်ခံစာ လိုအပ်ပါသည်။ အီးဂတ် ပတ်ဝန်းကျင်ဝန်ဆောင်မှုကုမ္ပဏီသည် ဤကနဦးပတ်ဂန်းကျင်ဆန်းစစ်ခြင်း အစီရင်ခံစာကို ရေးသားပြုစုခဲ့ပါသည်။ ကနဦးပတ်ဂန်းကျင်ဆန်းစစ်ခြင်း အစီရင်ခံစာ ရေးသားပြုစု ခြင်း၏ ရည်ရွယ်ချက်မှာ ဖြစ်ပေါ်လာနိုင်သော ပတ်ဝန်းကျင်အပေါ် ထိခိုက်မှုများကို ခွဲခြားရွေးထုတ်ပြရန်နှင့် ထိခိုက်မှုများကို လျော့ချပေးနိုင်မည့်နည်းလမ်းများအားဖော်ထုတ်ပေးရန်တို့ ဖြစ်ပါသည်။ ဖြစ်ပေါ်လာနိုင်သော ထိခိုက်မှုများနှင့် လျော့ချပေးနိုင်မည့် နည်းလမ်းများအား သိသာထင်ရှား

နိုင်သည့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်နှင့် စောင့်ကြပ်ကြည့်ရှုမည့် အစီအစဉ်ကိုလည်း ရေးဆွဲပေးရန်လိုအပ်ပါသည်။ ***(အသေးစိတ်ကို အခန်း ၁ တွင် ကြည့်ရှုပါရန်)***

လက်တွေ့ကွင်းဆင်းလေ့လာခြင်းရလဒ်များကို အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ (၂၀၁၅) နှင့် လေအရည်အသွေး၊ ဆူညံမှု နှင့် ရေအရည်အသွေးများအတွက် ကမ္ဘာ့ကျန်းမာရေးအဖွဲ့အစည်းမှ လမ်းညွှန်ချက်များ (၂၀၁၇) နှင့် နှိုင်းယှဉ်၍ ဖော်ပြထားပါသည်။ ***(အသေးစိတ်ကို အခန်း ၅ တွင် ကြည့်ရှုပါရန်)***

တည်ရှိဆဲပတ်ဝန်းကျင်အခြေအနေများဖြစ်ကြသော မိုးရေချိန်၊ အပူချိန်၊ လူမှုစီးပွားရေးနှင့် မြေအသုံးချရေး အချက်အလက်များအတွက် အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ ရှမ်းပြည်နယ် ကျိုင်းတုံမြို့နယ်နှင့် မိုင်းပြင်းမြို့နယ်မှ ရရှိသောအချက် အလက်များ ကို ရယူရေးသားထားပါသည်။ လေနှင့်ဆူညံသံကို စီမံကိန်းဇရိယာအတွင်းတွင် EPAS နှင့် Digital Sound Level Meter တို့ဖြင့် တိုင်းတာခဲ့ပါသည်။ လေအရည်အသွေး နှင့် ဆူညံသံ များကို စီမံကိန်းလုပ်ဆောင်မည့် နေရာအနီးတစ်ဝိုက် (၃) နေရာတွင် တိုင်းတာခဲ့ပါသည်။ လေအရည်အသွေးနှင့် ဆူညံသံ အဆင့်များကို ၂၀၁၇ ခုနှစ်၊ မတ်လ ၂၅ ရက်နေ့နှင့် ၂၆ ရက်နေ့တွင် ကျိုင်းတုံမြို့နယ်၊ ပန်ကြူကျေးရွာရှိ မြောက်လဒ်တီတွဒ် (၂၁ °၁၆' ၁၈.၁၃") နှင့် အရှေ့လဒ်တီတွဒ် (၉၉°၃၂'၅၂.၉၃") တို့တွင်လည်းကောင်း၊ ၂၀၁၇ ခုနှစ်၊ မတ်လ ၂၉ ရက်နေ့နှင့် ၃၀ ရက်နေ့တွင် မိုင်းပြင်းမြို့နယ် ခိုနားကျောင်းကျေးရွာရှိ မြောက်လဒ်တီတွဒ် (၂၁°၂၀'၂၃.၈၉") နှင့် ရှေ့လဒ်တီတွဒ် (၉၉°၀၉'၀၈.၈၄") တို့တွင်လည်းကောင်း၊ ၂၀၁၇ ခုနှစ်၊ မတ်လ ၃၁ ရက်နေ့နှင့် ဧပြီလ ၁ ရက်နေ့တွင် မိုင်းပြင်းမြို့နယ်၊ ဆင်မောင်းကျေးရွာရှိ မြောက်လဒ်တီတွဒ် (၂၁°၁၇' ၃၃.၇၅") နှင့် ရှေ့လဒ်တီတွဒ် (၉၈°၄၉'၄၂.၂၁″) တို့တွင်လည်းကောင်း တိုင်းတာခဲ့ပါသည်။ ရေအရည်အသွေးတိုင်းတာခြင်းကို ၂၀၁၇ခုနှစ်၊ မတ်လ၂၆ နှင့် ၂၈ရက်တွင် နမ့်အော်ရွာနှင့် ဆင်မောင်းရွာ၊ ဧပြီလ ၁ ရက် နေ့တွင် နားလုံချောင်းတွင် တိုင်းတာခဲ့ပါသည်။ စီမံကိန်းအနီးရှိ စီးဆင်းနေသောချောင်းမှ ရေနှင့် အနီးနားကျေးရွာမှ မြေအောက်ရေတို့ကို နမူနာရယူခဲ့ပြီး ISO TECH Laboratory နှင့် Occupational Health and Environmental Health Laboratory တို့တွင် စမ်းသပ်ခဲ့ပါသည်။ ရလဒ်များကို ပြည်တွင်းနှင့်ပြည်ပ စံချိန်စံနှုန်းများဖြင့် နှိုင်းယှဉ်ဖော်ပြ ထားပါသည်။ ယခင်က လူမှုစီးပွားစစ်တမ်းများကို လမ်းအူကြောင်းတစ်လျှောက် စစ်တမ်းကောက်ယူပြီး ဖြစ်ပါသည်။ အီးဂတ် ပတ်ဂန်းကျင်ဆိုင်ရာဂန်ဆောင်မှု ကုမ္ပဏီမှလည်း ဇီဝမျိုးစုံမျိုးကွဲများစစ်တမ်းကို သစ်တောဌာနနှင့် ဒေသခံအမဲလိုက်ပြည်သူတို့နှင့် ပူးပေါင်း၍

ပန်ကြူကြီးပြင်ကာကွယ်တောအတွင်းတွင် စစ်တမ်းကောက်ယူခဲ့ပါသည်။ ***(အသေးစိတ်ကို အခန်း ၅ တွင် အသေးစိတ်ကြည့်ရှုရန်)***

ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း အစီရင်ခံစာကို ဆိုးကျိုးများနှင့် ၎င်းတို့၏သက်ရောက်နိုင်မှုအပေါ် အခြေခံပြီးလည်း ပြင်ဆင်ထားပါသည်။ အောင်မြင့်မိုရ်ကုမ္ပဏီလီမိတက်မှ ဆောင်ရွက်မည့် ၂၃၀ ကေဗွီ မဟာမာတ်အားလိုင်း သွယ်တန်းခြင်းစီမံကိန်းအတွက် ကာလနှစ်ခုလုံးတွင် ပတ်ဝန်းကျင်စီမံခန့်ခွဲရေး၊ ကျန်းမာရေးနှင့်ဘေးအန္တရာယ်ကင်းရှင်းရေးစသော တိကျသော မူဘောင်အတွင်းမှလည်း ရေးသားပြုစုထားပါသည်။ ၎င်းအစီရင်ခံစာကို အပိုင်း ငါးပိုင်းခွဲခြားနိုင်ပါသည်။

- ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်
- ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုမှုအစီအစဉ်
- ကျန်းမာရေးနှင့်ဘေးကင်းလုံခြုံရေးအစီအစဉ်
- အရေးပေါ်အစီအစဉ် နှင့်
- လူမှုစီးပွားတာဝန်ယူမှုနှင့်တာဝန်သိတတ်မှုအစီအစဉ်

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တွင် လုပ်ဆောင်ချက်များ၊ ရည်ရွယ်ချက်များ၊ တာဝါတိုင် တည်ဆောက်ခြင်းကြောင့် ဖြစ်ပေါ်လာနိုင်သော ဆိုးကျိုးများနှင့် လျော့ချပေးနိုင်မည့် နည်းလမ်းများကို ခွဲခြားဖော်ထုတ်ထားပါသည်။ သင့်တော်စွာစီမံဆောင်ရွက်နိုင်ရန်အတွက်လည်း ခန့်မှန်းကုန်ကျစရိတ်နှင့် တာဝန်ယူ ဆောင်ရွက်ရမည့်သူများကိုလည်း ၎င်းအစီအစဉ်တွင် ဖော်ပြထားပါသည်။ ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုမှု အစီအစဉ်တွင် ပတ်ဝန်းကျင်အရည်အသွေး နယ်ပယ်သတ်မှတ်ချက်များ၊ အချိန်ကာလ၊ ပြန်လည်ပြုပြင်ရေး အစီအစဉ်၊ ခန့်မှန်းကုန်ကျစရိတ်နှင့် တာဝန်ယူဆောင်ရွက်ရမည့်သူများတို့ကို ဖော်ပြထားပါသည်။ ကျန်းမာရေးနှင့်ဘေးကင်း လုံခြုံရေး အစီအစဉ်တွင် ဝန်ထမ်းများနှင့် အနီးအနားရှိဒေသခံများအား အသိပညာပေးရန်အတွက် ရှေးဦးသူနာပြုစုနည်းသင်တန်းအစီအစဉ် ပါဝင်ပါသည်။ အရေးပေါ် အစီအစဉ်တွင် အရေးပေါ် ဖြစ်ပေါ်လာနိုင်သော ကိစ္စများအား လျော့နည်းရန်နှင့် ရောဂါများနှင့်ဘေးအန္တရာယ်များမှ ကာကွယ်နိုင်ရန်အတွက် မီးဘေးအန္တရာယ်နှင့် မြေပြိုခြင်းအန္တရာယ်တို့မှ ကာကွယ်နိုင်မည့် နည်းလမ်းများ ပါဝင်ပါသည်။ လူမှုစီးပွား တာဝန်ယူမှုနှင့် တာဝန်သိတတ်မှုအစီအစဉ်တွင် ဝန်ထမ်းများနှင့် မိသားစုများ၏လူနေမှုဘဝလုံခြုံစေရန်၊ အနီးအနားရှိအဖွဲ့အစည်းများနှင့်လည်း

ပိုမိုကောင်းမွန်သောနေထိုင်မှုစနစ်နှင့် ပွင့်လင်းရင်းနှီး သောဆက်ဆံမှု ရရှိရန်အတွက်လည်း ရည်ရွယ်ထားပါသည်။ (***အသေးစိတ်ကို အခန်း(၈)တွင် ကြည့်ရှု့ပါရန်***)

အချုပ်အားဖြင့် ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီရင်ခံစာသည် မဟာမတ်အားလိုင်းသွယ်တန်းခြင်း စီမံကိန်းအတွက် ပတ်ဝန်းကျင်အပေါ် သက်ရောက်နိုင်သည့် ထိခိုက်မှုများအား ရှာဖွေဖော်ထုတ်ပြီး ဆန်းစစ်ခြင်းနှင့် ထိခိုက်မှုလျော့ချရေး နည်းလမ်းများကို အကြံပြုတားဆီးခြင်းနှင့် လျော့ချရေးဖော်ဆောင်မှုအား စောင့်ကြပ်ကြည့်ရှု့တိုင်းတာသည့် စနစ်ကိုဖော်ထုတ်ပြီး ဖြစ်ပါသည်။

EXECUTIVE SUMMARY

Myanmar has been suffering frequent electrical shortages and lengthy blackouts for many years due to insufficient electrical power supply. Consequently development of country's economic sector, living standards of citizens and other sectors, which totally rely on power supply, has been hardly hampered.

In order to overcome the current power deficiency crisis, Ministry of Electricity and Energy (MOEE) has been planning to accelerate the development of power generation, transmission and distribution facilities including exploring additional hydropower sources, construction of new power grid and substation, upgrading existing systems, seeking sustainable and renewable energy development and other available means of energy sources in consultation with oversea finical institutions and development partners.

As a result, this 230 kV power transmission line (TL) and substation (SS) project was operated as an essential infrastructure with intention of boosting the capacity of country's power grid facility, which will play vital role to meet the substantial needs of electrical power supply in Myanmar.

The Ministry of Electricity and Energy (MOEE) has plan to construct new 230 kV transmission lines section 2, and two new substations in Shan state.

Under Myanmar Environmental Conservation Law (2012), the construction of 230 KV power transmission line project requires an Initial Environmental Examination for implementation at all phases of the project cycle. So, this IEE has been prepared by E Guard Environmental Services Company Limited, in line with Myanmar Environmental Conservation Law (2012). The purpose of this study is to ensure adequate identification of potentially negative environmental impacts and to propose workable mitigation measures for the proponent. It will also necessary to formulate an Environmental Management and Monitoring Plan articulating envisaged impacts and mitigations. ***(See details in Chapter I)***

The National Environmental Quality (Emission) Guidelines (2015) and World Health Organization (WHO) Guidelines for Air, Noise and Wastewater Quality, (2007), are applied for comparing the results of field data. ***(See details in Chapter V)***

For existing baseline, environmental condition such as rainfall, temperature, ecological resources, socio-economic and land use data, secondary data from General Administrative Department, Keng Teng Township and Mong Pyin Township has been used. The air, dust and noise qualities were measured in the proposed project site by EPAS and Digital Sound Level Meter. The first point that is measured near the Project site in Keng Teng Township, Pan Kyuu village which is situated at latitude **21°16'18.13"N and longitude 99°32'52.93"E and elevation is 3284 ft** at 25th and 26th March 2017. The second point that is measured near the Project site in Mong Pyin Township, Kho Nar Kyaung village which is situated at latitude

21°20'23.89"N and longitude 99°09'08.84"E and elevation is 2883 ft at 29th and 30th March. The third point that is measured near the Project Site in Mong Pyin Township, Sin Maung village, which is situated at latitude 21°17'33.75"N and longitude 98°49'42.21"E and elevation is 2093 ft at 31st March and 1st April 2017.Water quality was measured on Namaww village, Sin Maung village and Narlon stream at 26th and 28th March and 1st April. Other qualities such as surface water near the project site the village were collected and tested in ISO TECH \Laboratory and Occupational and Environmental Health Laboratory. The results are compared with national and international standards. The primary socio-economic survey are conducted at villages which route line across and we, E Guard also conduct biodiversity cooperate with local hunter and local forest department at Pankyu Protected Public forest. ***(See details in Chapter V)***

The Initial Environmental Examination (IEE) is prepared based on findings of impacts and its significance. It has designed as a strict environmental management and health and safety framework for all two phases (construction and operation) of proposed project by the proponent. This plan can be divided into five parts:

- Environmental Management Plan (EMP),
- Environmental Monitoring Plan (EMOP),
- Community Health and Safety Plan,
- Emergency Preparedness and Response Plan,
- Corporate Social Responsibility Plan (CSR)
- Community Grievance Redress Mechanism

The ***Environmental Management Plan (EMP)*** identifies the activities, objectives, sources of impacts and mitigation measures to prevent even possible minor impacts on surrounding environment due to the construction activities of project. It also includes estimated costs and responsible person or unit for proper implementation. The ***Environmental Monitoring Plan*** indicates the parameters of environmental qualities (air, noise, water and soil), rehabilitation process, timeframe, its estimated costs and responsible person or unit. ***The Community Health and Safety Plan*** include first-aid training to educate the workers and public consultation nearby communities. The ***Emergency Response Plan*** includes fire hazards, oil spills and landslides to minimize emergency cases and to protect lives from diseases and disasters. The ***Corporate Social Responsibility (CSR)*** plan aims to secure social well-being of the employees and their family members, better community living and transparent and friendly relationship with neighboring communities. ***(See details in Chapter VIII).***

This EMP has, in brief, systematically explored all possible positive and negative environmental impacts of the proposed project and identified the monitoring and mitigation measures on negative impacts which can occur in three phases.

CHAPTER – I INTRODUCTION

1.1 Background

Myanmar has been suffering frequent electrical shortages and lengthy blackouts for many years due to insufficient electrical power supply. Consequently, development of country's economic sector, living standards of citizens and other sectors which totally rely on power supply has been hardly hampered.

It is obvious that securing sufficient electrical supply is an essential tool to boost the country's economic growth, to alleviate the poverty, to bring a better social security system including education, health and welfare and to stabilize and promote the living standard of citizens across the country.

In order to overcome the current power deficiency crisis, Ministry of Electricity and Energy(MOEE) has been planning to accelerate the development of power generation, transmission and distribution facilities including exploring additional hydropower sources, construction of new power grid and substation, upgrading existing systems, seeking sustainable and renewable energy development and other available means of energy sources in consultation with oversea finical institutions and development partners.

As the whole country still needed to get sufficient amount of electrical supply, Shan state was also deficient in electrical supply. At current condition, government tried to send electricity with power transmission tower from south Shan state to east Shan state. According to Government development plan, Power Transmission Project under the DPTSC (PTP) tried to provide electricity to necessary region in Shan state. This project is one of the electricity supply project of Shan state. The proposed project is erection of 230 KV power transmission tower from Namp San-Mong Pyin-Keng Teng. It has two sections, the first section is from Section-A from Namp San-Kholan-Khunhein-Tarkaw and Seciton-B from Tarkaw-Mong Pyin-Toneta-Keng Teng longed about 119.84 km (74.4 miles). This Initial Environmental Examination (IEE) report is for construction and erection of power transmission tower for Section-B.

The specific objectives of this study are:

1) Identify the major impacts that may arise from the activities of the proposed project on natural environment and socio-economic environment of the project area,
2) Describe the mitigation measures to minimize these impacts,
3) Prepare and implement Environmental Management Plan for the project and
4) Make sure that IEE is developed sufficiently and soundly for the proposed project.

5) Corporate Social Responsibility Plan (CSR Plan) plays an essential part for the improvement of the social welfare of community as well as development of the region.

1.2 Project Details

1.2.1 Location of Transmission Line and Design

The study area of proposed 230kV TL alignment will originate in New Substation located in Namp San Region which located in Southern Shan State and terminate in Keng Teng Substation in Eastern Shan State.

1.2.2 Power Transmission Line

Estimate of proposed new 230kV Power Transmission Line is about 78 miles at highland section. After Route Survey measurement, the following are Tower List calculated with PLS CAD Software. The distance between the tower station and the main road is 800- 1000 feet (minimum) and 1600 feet (maximum). The highest length of tower is 80 feet (35 m) and the lowest length of tower is 45 -50 feet (19 m). The distance between each tower and another is 600- 1200 m. Myanmar kyats 42445754.19 million are used for this project. Tension Tower Usage is 136-NOS (43.7%) and Suspension Tower Usage is 175-NOS (56.3%).

Detail description about transmission line is shown in below.

Table 1. 1: Detail description about transmission line

3rd

NAM SANG - MONG PYIN

(SECTION-2)

230kV POWER TRANSMISSION LINE (25.9 MILES)

TOWER LIST

Sr.	Tower Type	NAME	Qty	Total	Leg Ext.			Deviation Angle	Maximum Wind span	Maximum Weight Span	Manimum Weight Span
					1m	2m	3m				
1	DST.0-19	Suspension Tower For Double Circuit	10	58				0° ~ 0°	600	800	
2	DST.0-22		22					0° ~ 0°	600	800	
3	DST.0-25		5					0° ~ 0°	600	800	
4	DST.0-28		10					0° ~ 0°	600	800	
5	DST.0-31		2					0° ~ 0°	600	800	
6	DST.0-33		5					0° ~ 0°	600	800	
7	DST.0-35		4					0° ~ 0°	600	800	
8	DTT.1-19	Tension Tower For Double Circuit	11	41				0° ~ 30°	600	800	-600
9	DTT.1-22		10					0° ~ 30°	600	800	-600
10	DTT.1-25		5					0° ~ 30°	600	800	-600
11	DTT.1-28		4					0° ~ 30°	600	800	-600
12	DTT.1-31		1					0° ~ 30°	600	800	-600
13	DTT.2-19		5					30° ~ 60°	600	800	-600
14	DTT.2-22		5					30° ~ 60°	600	800	-600
15	DTTE-22	Terminal Tower For Double Circuit	1	1				0° ~ 30°	400	400	
16	DST.0-22 (S)	Suspension Special Tower For Double Circuit	4	4				0° ~ 0°	800	1200	-500
17	DTT.1-19 (S)	Tension Special Tower For Double Circuit	2	4				0° ~ 30°	800	1200	-500
18	DTT.1-22 (S)		1					0° ~ 30°	800	1200	-500
19	DTT.2-19 (S)		1					30° ~ 60°	800	1200	-500
TOTAL				108	4.2 TOWERS/MILE				Date(20.6.2017)		

Tension Tower Usage - 46 Nos (42.6%)

Suspension Tower Usage - 62 Nos (57.4%)

3rd

MONG PYIN - KENG TON

230kV POWER TRANSMISSION LINE (48.5 MILES)

TOWER LIST

Sr.	Tower Type	NAME	Qty	Total	Leg Ext.			Deviation Angle	Maximum Wind span	Maximum Weight Span	Manimum Weight Span
					1m	2m	3m				
1	DST.0-19	Suspension Tower For Double Circuit	19	109				0° ~ 0°	600	800	
2	DST.0-22		33					0° ~ 0°	600	800	
3	DST.0-25		15					0° ~ 0°	600	800	
4	DST.0-28		22					0° ~ 0°	600	800	
5	DST.0-31		3					0° ~ 0°	600	800	
6	DST.0-33		6					0° ~ 0°	600	800	
7	DST.0-35		11					0° ~ 0°	600	800	
8	DTT.1-19	Tension Tower For Double Circuit	26	67				0° ~ 30°	600	800	-600
9	DTT.1-22		19					0° ~ 30°	600	800	-600
10	DTT.1-25		6					0° ~ 30°	600	800	-600
11	DTT.1-28		5					0° ~ 30°	600	800	-600
12	DTT.2-19		4					30° ~ 60°	600	800	-600
13	DTT.2-22		6					30° ~ 60°	600	800	-600
14	DTT.2-25		1					30° ~ 60°	600	800	-600
15	DTTE-22	Terminal Tower For Double Circuit	2	2				0° ~ 30°	400	400	
16	DST.0-19 (S)	Suspension Special Tower For Double Circuit	1	3				0° ~ 0°	800	1200	-500
17	DST.0-22 (S)		2					0° ~ 0°	800	1200	-500
18	DTT.1-19 (S)	Tension Special Tower For Double Circuit	7	14				0° ~ 30°	800	1200	-500
19	DTT.1-22 (S)		2					0° ~ 30°	800	1200	-500
20	DTT.1-28 (S)		3					0° ~ 30°	800	1200	-500
21	DTT.2-19 (S)		2					30° ~ 60°	800	1200	-500
TOTAL				195	4 TOWERS/MILE				Date(20.6.2017)		

Tension Tower Usage - 83 Nos (42.6%)

Suspension Tower Usage - 112 Nos (57.4%)

The following are main towns/villages and rivers/creeks on passing through Power Transmission Line.

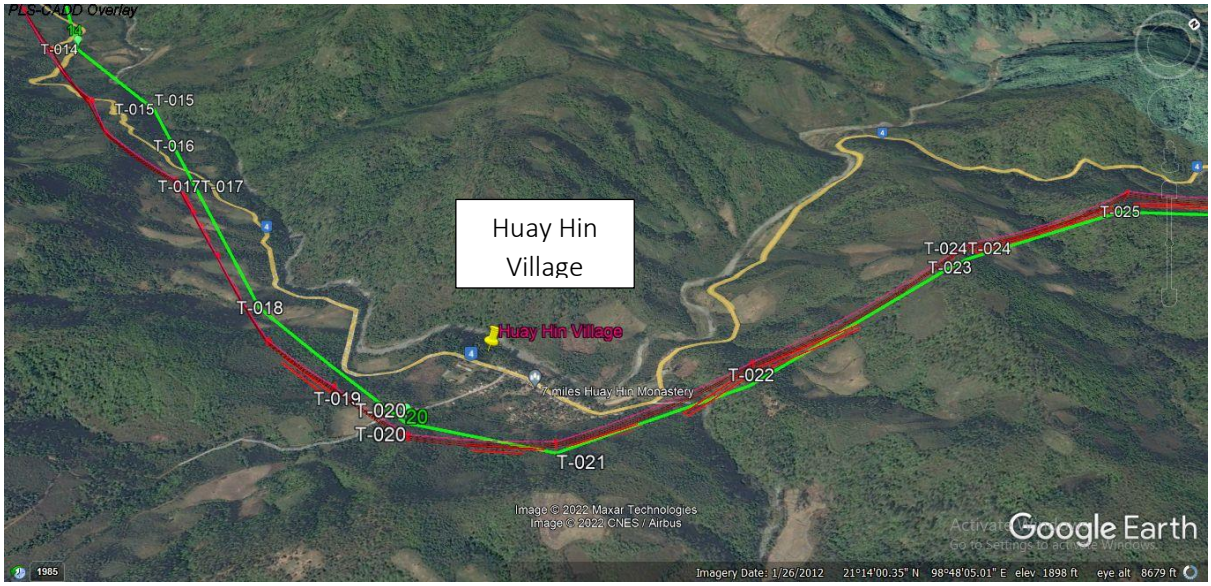
Table 1. 2: Main towns/ villages and rivers/creeks on passing through Power Transmission Line

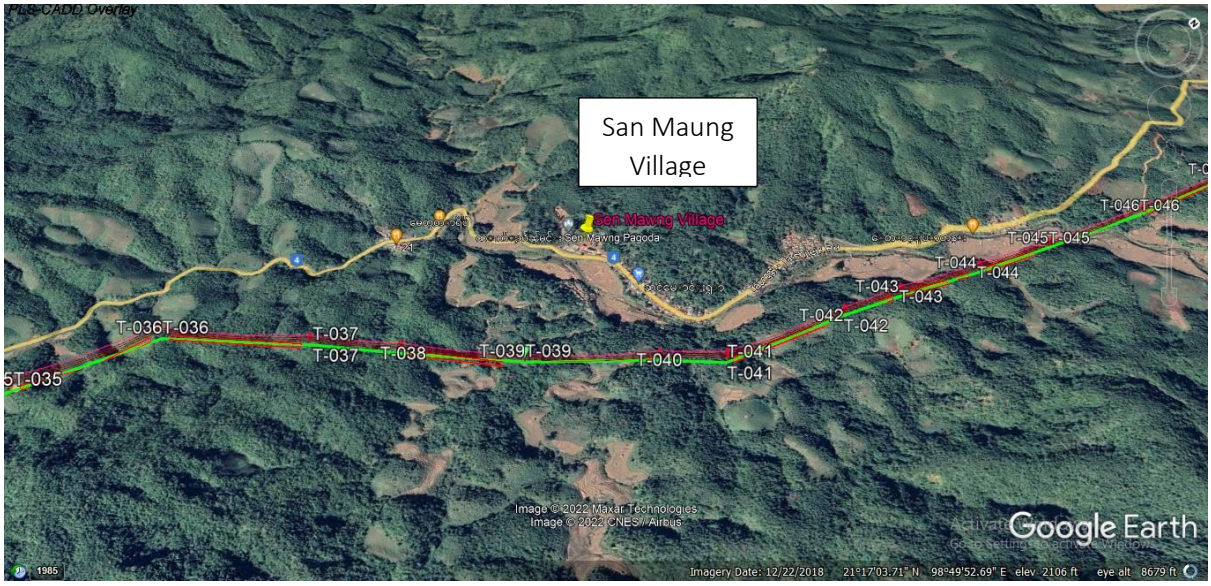
No.	Name of Town and Village	Power Transmission Road section
1.	Naung Ann village	T-3 to T-4
2.	Narr Lone village	T-4 to T-5
3.	Hwee Yan village	T-19 to T-20
4.	Sann Mwon village	T-39 to T-40
5.	Mongpingvillage	T-102 to T-103
6.	Wan Hpa Wao village	T-019 to T-020
7.	Man Pyin village	T-026 to T-027
8.	Won Kho Kwan village	T-033 to T-034
9.	Kham Paw village	T-041 to T-042
10.	Naung Cho village	T-051 to T-052
11.	Pang Nawng Long village	T-063 to T-064
12.	Mong Leng village	T-070 to T-071

No.	Name of Town and Village	Power Transmission Road section
13.	Tong Ta village	T-079 to T-080
14.	Mong Ka Village	T-084 to T-085
15.	Hkon Hpyon village	T-091 to T-092
16.	Taung Chay village	T-097 to T-098
17.	Pang Ma Mun village	T-099 to T-100
18.	Ho Pang village	T-108 to T-109
19.	Pang Kyu village	T-123 to T-124
20.	Pang Yawng village	T-128 to T-129
21.	Pang Hsang village	T-142 to T-143
22.	Wan Pang U village	T-150 to T-151
23.	Wan Namaw village	T-152 to T-153
24.	Kyaing Hpawng village	T-157 to T-158
25.	Kyaing Ton village	T-169 to T-170
26.	Nawng Hkun Village	T-174 to T-175
27.	Wan Tawng Village	T-193 to T-194

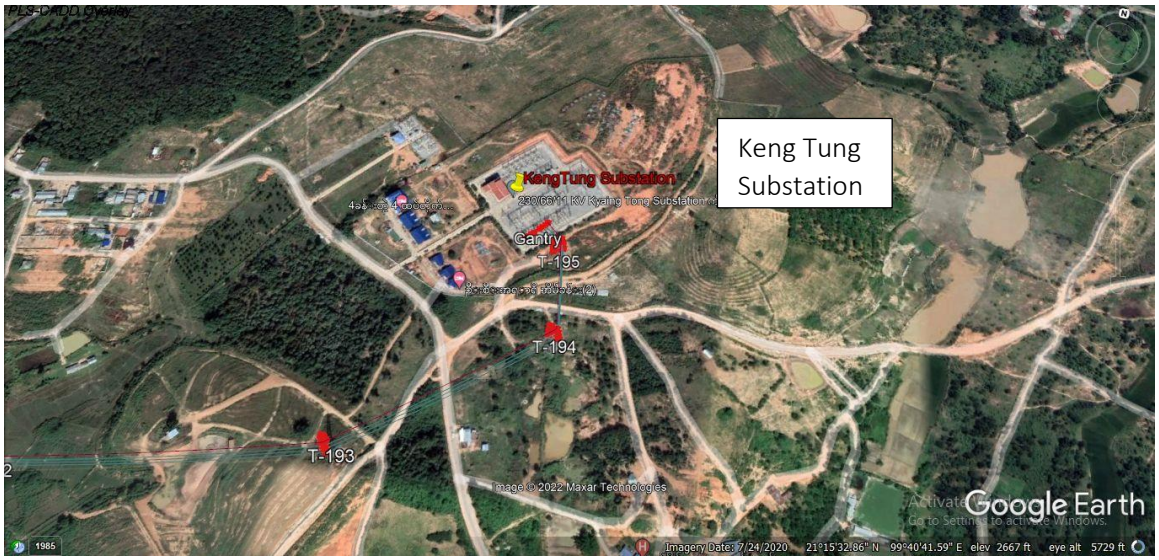
No.	Name of Rivers and Creeks	Power Transmission Road Section
	Creek	
1.	Nawng Awn Creek	T-3 to T-4
2.	Nan Lon Creek	T-6 to T-7
3.	Hwe Yang Creek	T-21 to T-22
4.	Hsen Mawng Creek	T-45 to T-46
5.	Hsen Mawng Creek	T-61 to T-62
6.	Mong Pyin Creek	T-104 to T-105
7.	Pang Nawng Long Creek	T-65 to T-66
8.	Pang Nawng Long Creek	T-67 to T-70
9.	Mong Leng Creek	T-71 to T-72
10.	Mong Leng Creek	T-74 to T-75
11.	Mong Leng Creek	T-82 to T-83
12.	Pang Hsang Creek	T-146 to T-147
13.	Wan Pang U Creek	T-151 to T-152
14.	Kyaing Hpawng Creek	T-156 to T-157
15.	Kyaing Ton Creek	T-165 to T-166
16.	Nawng Hkun Creek	T-175 to T-178
17.	Nawng Hkun Creek	T-182 to T-183

Column No (T-22 to 35 and 39 to 53) section are pass through Naung Cho Protected Public Forest and Column No (T- 94 to T-123) section are pass through Pann kyuu Protected Public Forest. Protected Public Forest are passed through 9.07 miles (12.19%).

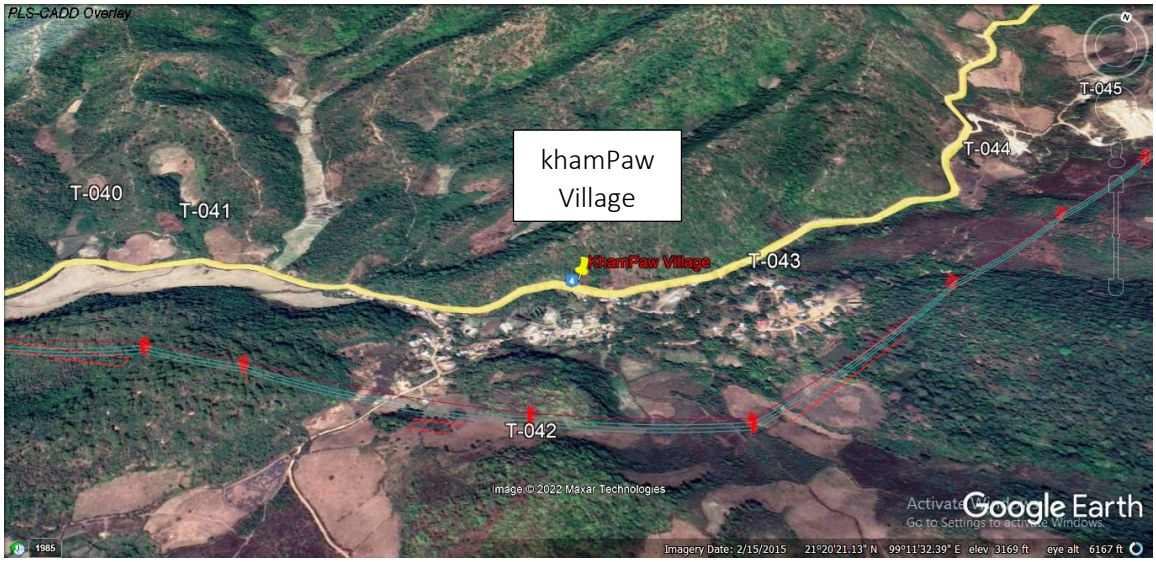

PLS-CADD Overlay
T-014
T-015
T-015
T-016
T-017T-017
T-018
T-019
T-020
T-020
T-021
T-022
T-023
T-024T-024
T-025
Huay Hin Village
Huay Hin Village
Image © 2022 Maxar Technologies
Image © 2022 CNES / Airbus
Google Earth
Imagery Date: 1/26/2012 21°14'00.35" N 98°48'05.01" E elev 1898 ft eye alt 8679 ft


PLS-CADD Overlay
San Maung Village
San Maung Village
T-035
T-036T-036
T-037
T-037
T-038
T-039T-039
T-040
T-041
T-041
T-042
T-042
T-043
T-043
T-044
T-044
T-045T-045
T-046T-046
Image © 2022 Maxar Technologies
Image © 2022 CNES / Airbus
Google Earth
Imagery Date: 12/22/2018 21°17'03.71" N 98°49'52.69" E elev 2106 ft eye alt 8679 ft

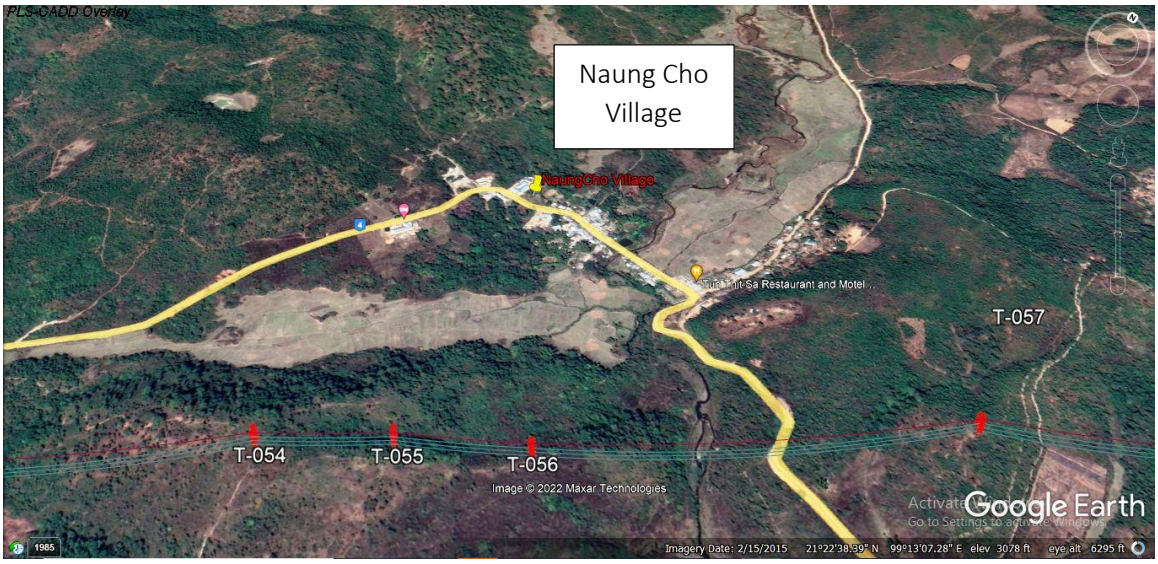

PLS-CADD Overlay
T-103
T-104
T-105
T-106T-106
T-107
T-107
T-108
T-108
Mong Pyin Substation
Gantry
MongPying Substation
Mine Pyinn
Image © 2022 CNES / Airbus
Google Earth
Imagery Date: 9/28/2021 21°20'23.94" N 99°01'37.83" E elev 1512 ft eye alt 4523 ft


PLS-CADD Overlay
Keng Tung Substation
KengTung Substation
Gantry
T-195
T-194
T-193
Image © 2022 Maxar Technologies
Google Earth
Imagery Date: 7/24/2020 21°15'32.86" N 99°40'41.59" E elev 2667 ft eye alt 5729 ft


PLS-CADD Overlay
Keng Tung City
KengTung City
Kyaing Tong
T-157
T-158
T-159
T-160
T-161
T-163
T-164
T-165
T-166
T-167
T-168
T-169
T-170
Image © 2022 Maxar Technologies
Google Earth
21°15'39.43" N 99°36'12.72" E elev 2725 ft eye alt 15065 ft


PLS-CADD Overlay
khamPaw Village
T-040
T-041
T-042
T-043
T-044
T-045
KhamPaw Village
Image © 2022 Maxar Technologies
Google Earth
Imagery Date: 2/15/2015 21°20'21.13" N 99°11'32.39" E elev 3169 ft eye alt 6167 ft


PLS-CADD Overlay
kyaingHpawing Village
T-157
T-158
Image © 2022 Maxar Technologies
Google Earth


PLS-CADD Overlay
Naung Cho Village
NaungCho Village
T-057
T-054
T-055
T-056
Image © 2022 Maxar Technologies
Google Earth


PLS-CADD Overlay
NaungHkun Village
Keng Tung Fishing Park
T-172
T-173
T-174
T-175
T-176
T-177
T-178
T-179
T-180
T-181
T-182
T-183
T-184
T-185
Image © 2022 Maxar Technologies
Google Earth

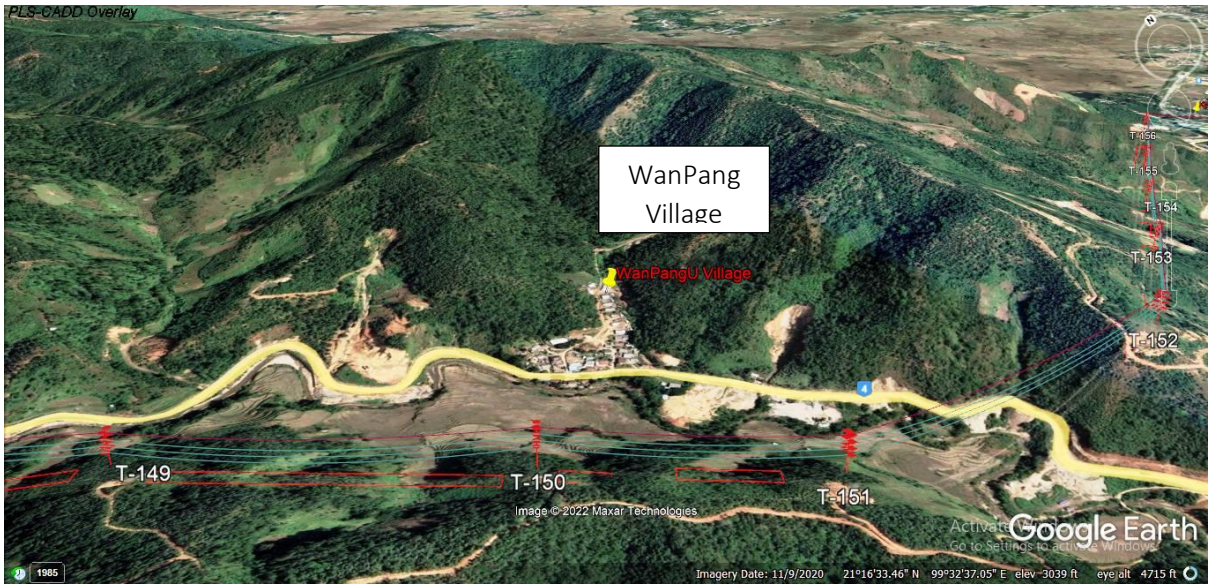

PLS-CADD Overlay
PanKyu Village
T-121
T-122
Image © 2022 CNES / Airbus
Google Earth
Imagery Date: 4/1/2021 21°17'54.25" N 99°26'43.16" E elev 4949 ft eye alt 6272 ft


PLS-CADD Overlay
Tong Ta Town
T-077
T-078
T-079
T-080
T-081
Image © 2022 CNES / Airbus
Image © 2022 Maxar Technologies
Google Earth
Imagery Date: 2/6/2017 21°19'24.04" N 99°17'17.22" E elev 2747 ft eye alt 7913 ft

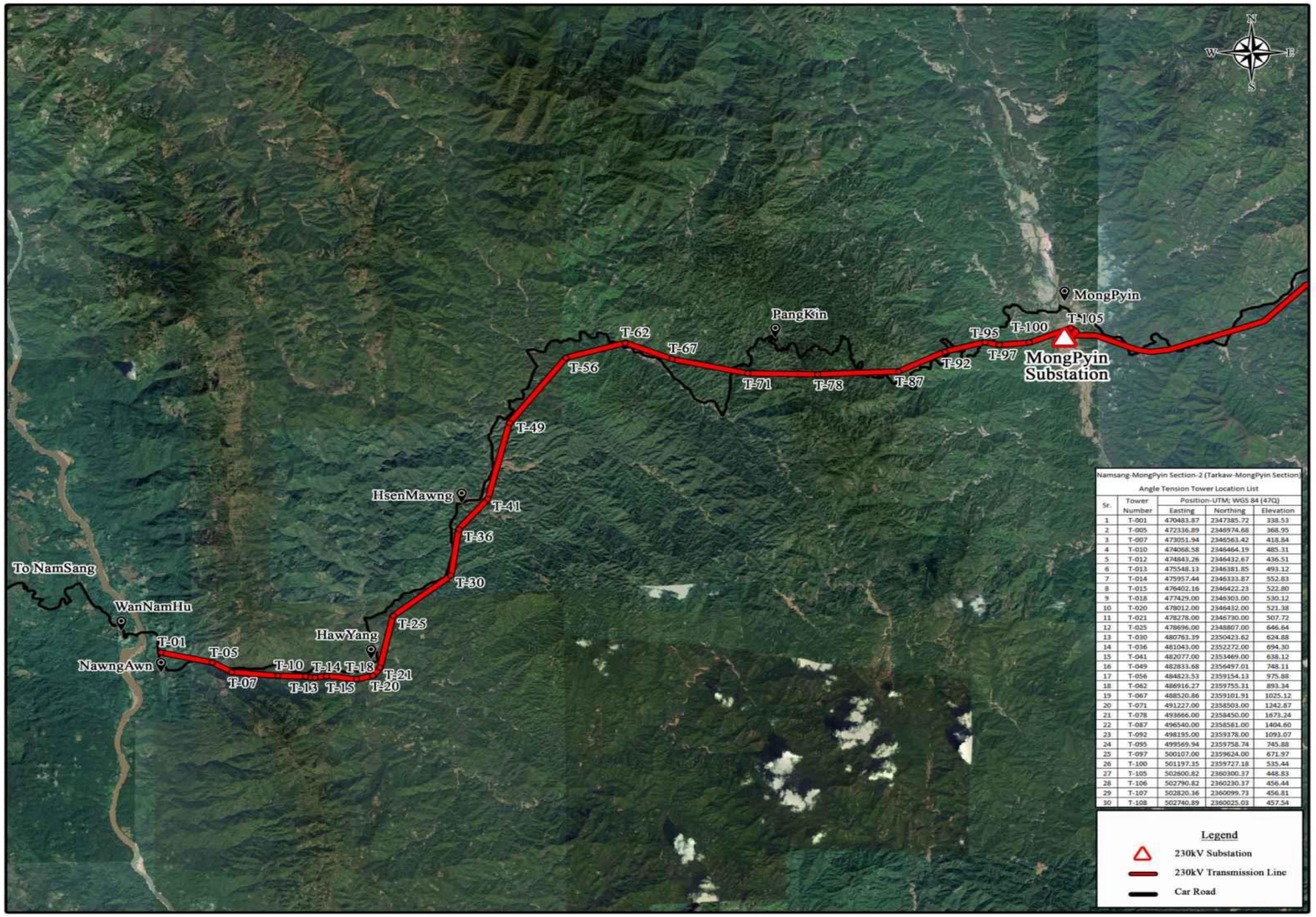

PLS-CADD Overlay
T-014
WanHpaWao Village
Image © 2022 Maxar Technologies
Google Earth
Imagery Date: 2/4/2015 21°20'24.84" N 99°04'37.44" E elev 1838 ft eye alt 3619 ft


PLS-CADD Overlay
Wankaokwan Village
WanKaoKwan Village
T-035
T-033
T-034
Image © 2022 Maxar Technologies
Google Earth
Imagery Date: 2/4/2015 21°20'20.24" N 99°09'34.64" E elev 2715 ft eye alt 6089 ft


PLS-CADD Overlay
T-152
T-153
T-154
Ma Soe Yein Monastery
WanNamaw Village
WanNanMaw Village
Image © 2022 Maxar Technologies
Google Earth
Imagery Date: 11/9/2020 21°16'28.01" N 99°33'06.76" E elev 2744 ft eye alt 4169 ft


PLS-CADD Overlay
WanPang Village
WanPangU Village
T-156
T-155
T-154
T-153
T-152
T-149
T-150
T-151
Image © 2022 Maxar Technologies
Google Earth
Imagery Date: 11/9/2020 21°16'33.46" N 99°32'37.05" E elev 3039 ft eye alt 4715 ft

230kV NamSang-MongPyin(Section-2) Power Transmission Line Route Map (25.9 Miles)

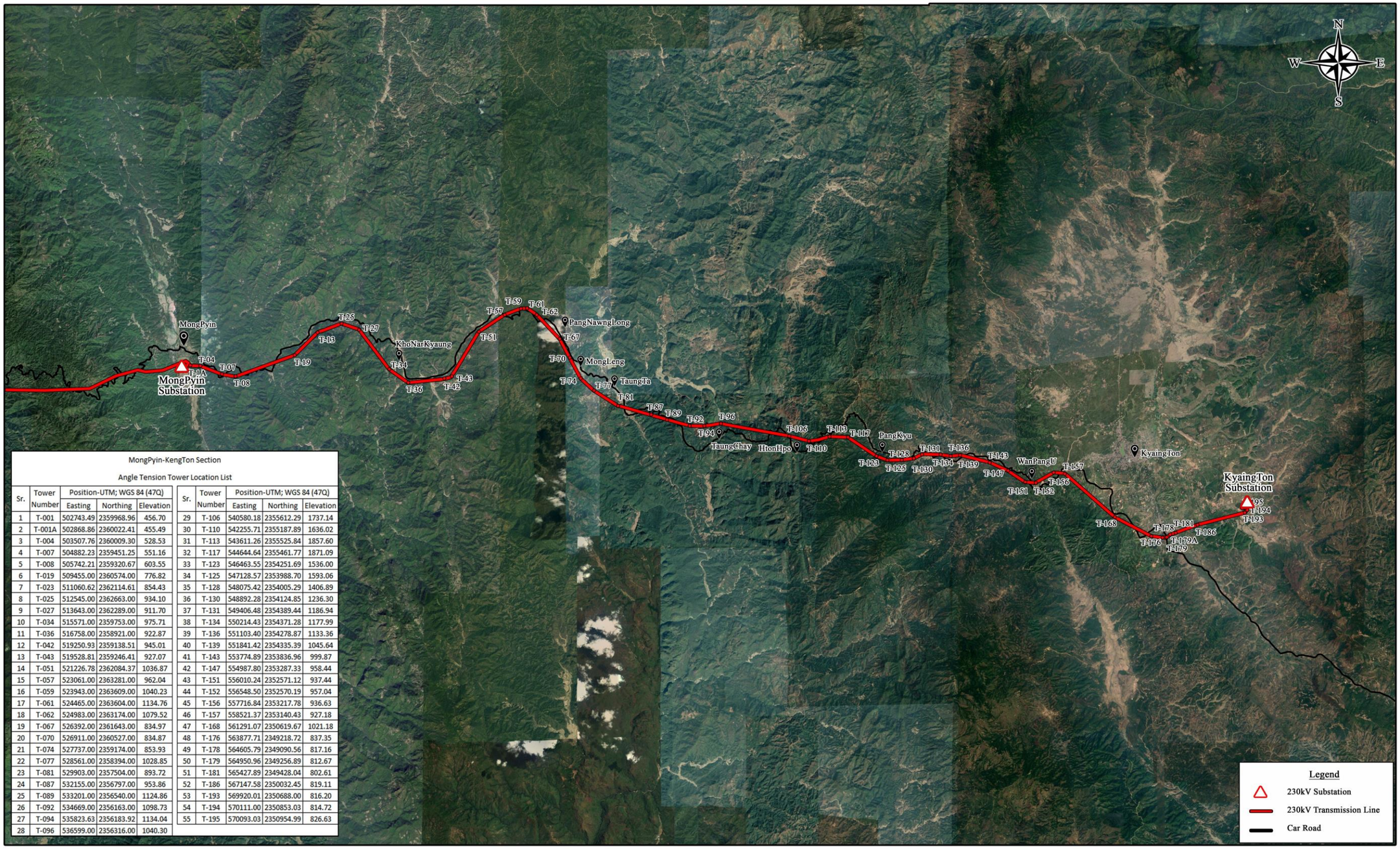


Namsang-MongPyin Section-2 (Tarkaw-MongPyin Section)
Angle Tension Tower Location List

Sr.	Tower Number	Position-UTM; WGS 84 (47Q)		
		Easting	Northing	Elevation
1	T-001	470483.87	2347385.72	338.53
2	T-005	472336.89	2346974.68	368.95
3	T-007	473051.94	2346563.42	418.84
4	T-010	474068.58	2346464.19	485.31
5	T-012	474843.26	2346432.67	436.51
6	T-013	475548.13	2346381.85	493.12
7	T-014	475957.44	2346333.87	552.83
8	T-015	476402.16	2346422.23	522.80
9	T-018	477429.00	2346303.00	530.12
10	T-020	478012.00	2346432.00	521.38
11	T-021	478278.00	2346730.00	507.72
12	T-025	478696.00	2348807.00	646.64
13	T-030	480763.39	2350423.62	624.88
14	T-036	481043.00	2352272.00	694.30
15	T-041	482077.00	2353469.00	638.12
16	T-049	482833.68	2356497.01	748.11
17	T-056	484823.53	2359154.13	975.88
18	T-062	486916.27	2359755.31	893.34
19	T-067	488520.86	2359101.91	1025.12
20	T-071	491227.00	2358503.00	1242.87
21	T-078	493666.00	2358450.00	1673.24
22	T-087	496540.00	2358581.00	1404.60
23	T-092	498195.00	2359378.00	1093.07
24	T-095	499569.94	2359758.74	745.88
25	T-097	500107.00	2359624.00	671.97
26	T-100	501197.35	2359727.18	535.44
27	T-105	502600.82	2360300.37	448.83
28	T-106	502790.82	2360230.37	456.44
29	T-107	502820.36	2360099.73	456.81
30	T-108	502740.89	2360025.03	457.54

Legend
230kV Substation
230kV Transmission Line
Car Road

230kV MongPyin-KyaingTon Power Transmission Line Route Map (48.5Miles)

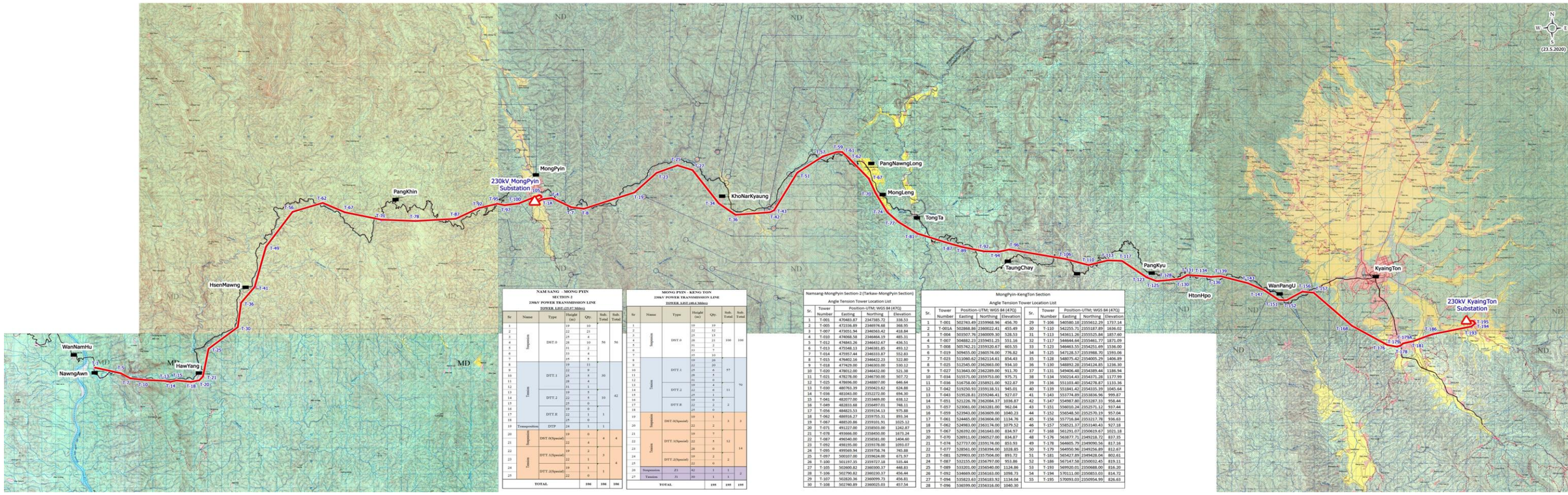


MongPyin-KengTon Section

Angle Tension Tower Location List

Sr.	Tower Number	Position-UTM; WGS 84 (47Q)			Sr.	Tower Number	Position-UTM; WGS 84 (47Q)		
		Easting	Northing	Elevation			Easting	Northing	Elevation
1	T-001	502743.49	2359968.96	456.70	29	T-106	540580.18	2355612.29	1737.14
2	T-001A	502868.86	2360022.41	455.49	30	T-110	542255.71	2355187.89	1636.02
3	T-004	503507.76	2360009.30	528.53	31	T-113	543611.26	2355525.84	1857.60
4	T-007	504882.23	2359451.25	551.16	32	T-117	544644.64	2355461.77	1871.09
5	T-008	505742.21	2359320.67	603.55	33	T-123	546463.55	2354251.69	1536.00
6	T-019	509455.00	2360574.00	776.82	34	T-125	547128.57	2353988.70	1593.06
7	T-023	511060.62	2362114.61	854.43	35	T-128	548075.42	2354005.29	1406.89
8	T-025	512545.00	2362663.00	934.10	36	T-130	548892.28	2354124.85	1236.30
9	T-027	513643.00	2362289.00	911.70	37	T-131	549406.48	2354389.44	1186.94
10	T-034	515571.00	2359753.00	975.71	38	T-134	550214.43	2354371.28	1177.99
11	T-036	516758.00	2358921.00	922.87	39	T-136	551103.40	2354278.87	1133.36
12	T-042	519250.93	2359138.51	945.01	40	T-139	551841.42	2354335.39	1045.64
13	T-043	519528.81	2359246.41	927.07	41	T-143	553774.89	2353836.96	999.87
14	T-051	521226.78	2362084.37	1036.87	42	T-147	554987.80	2353287.33	958.44
15	T-057	523061.00	2363281.00	962.04	43	T-151	556010.24	2352571.12	937.44
16	T-059	523943.00	2363609.00	1040.23	44	T-152	556548.50	2352570.19	957.04
17	T-061	524465.00	2363604.00	1134.76	45	T-156	557716.84	2353217.78	936.63
18	T-062	524983.00	2363174.00	1079.52	46	T-157	558521.37	2353140.43	927.18
19	T-067	526392.00	2361643.00	834.97	47	T-168	561291.07	2350619.67	1021.18
20	T-070	526911.00	2360527.00	834.87	48	T-176	563877.71	2349218.72	837.35
21	T-074	527737.00	2359174.00	853.93	49	T-178	564605.79	2349090.56	817.16
22	T-077	528561.00	2358394.00	1028.85	50	T-179	564950.96	2349256.89	812.67
23	T-081	529903.00	2357504.00	893.72	51	T-181	565427.89	2349428.04	802.61
24	T-087	532155.00	2356797.00	953.86	52	T-186	567147.58	2350032.45	819.11
25	T-089	533201.00	2356540.00	1124.86	53	T-193	569920.01	2350688.00	816.20
26	T-092	534669.00	2356163.00	1098.73	54	T-194	570111.00	2350853.03	814.72
27	T-094	535823.63	2356183.92	1134.04	55	T-195	570093.03	2350954.99	826.63
28	T-096	536599.00	2356316.00	1040.30					

၂၃၀ကေဗို နမ့်စန်-မိုင်းပျဉ်း-ဂျိုင်းတုံ (တာကော်တဲတား-ဂျိုင်းတုံအဝိုင်း) ဓာတ်အားလိုင်း လိုင်းအုပ်ကြောင်းပြမြေပုံ (၇၄.၆)မိုင်



NAM SANG - MONG PYIN SECTION-2 230kV POWER TRANSMISSION LINE TOWER LIST (35.87 Miles)

Sr	Name	Type	Height (m)	Qty.	Sub. Total	Sub. Total
1	Suspension	DST-0	19	10	56	56
2			22	23		
3			25	4		
4			28	10		
5			31	2		
6			33	4		
7			25	4	30	42
8	Tension	DST-1	19	11		
9			22	9		
10			25	9		
11			28	4		
12			31	1		
13		DST-2	19	5	10	
14			22	5		
15			25	0		
16		DST-E	19	0	1	
17			22	1		
18			25	0		
19	Transposition	DTP	24	1	1	1
20	Suspension	DST-0(Special)	19	0	4	4
21			22	4		
22	Tension	DST-1(Special)	19	2	3	4
23			22	1		
24		DST-2(Special)	19	1	1	
25			22	0		
TOTAL				106	106	106

MONG PYIN - KENG TON 230kV POWER TRANSMISSION LINE TOWER LIST (49.2 Miles)

Sr	Name	Type	Height (m)	Qty.	Sub. Total	Sub. Total
1	Suspension	DST-0	19	19	100	100
2			22	52		
3			25	15		
4			28	21		
5			31	2		
6			33	7		
7		DST-1	19	10	57	70
8			22	20		
9			25	20		
10			28	6		
11			31	1		
12		DST-2	19	4	11	
13			22	6		
14			25	1		
15		DST-E	19	0	2	
16			22	2		
17			25	0		
18	Suspension	DST-0(Special)	19	1	3	3
19			22	2		
20	Tension	DST-1(Special)	19	7	12	14
21			22	5		
22			28	0		
23		DST-2(Special)	19	2	2	
24			22	0		
25	Suspension	Z1	42	1	1	2
26	Tension	J1	50	1	1	
27	TOTAL				190	190

Namsang-MongPyin Section-2 (Tarkaw-MongPyin Section) Angle Tension Tower Location List

Sr.	Tower Number	Position-UTM; WGS 84 (47Q) Easting	Northing	Elevation
1	T-001	470483.87	2347385.72	338.53
2	T-005	472336.89	2348974.68	368.95
3	T-007	473051.94	2348563.42	418.84
4	T-010	474068.58	2346464.19	485.31
5	T-012	474843.26	2346432.67	436.51
6	T-013	475548.13	2346381.85	493.12
7	T-014	475957.44	2346333.87	552.83
8	T-015	476402.16	2346422.23	522.80
9	T-018	477629.00	2346303.00	530.12
10	T-020	478012.00	2346432.00	521.38
11	T-021	478278.00	2346730.00	507.72
12	T-025	478696.00	2348807.00	648.64
13	T-030	480763.39	2350423.62	624.88
14	T-036	481041.00	2352272.00	694.30
15	T-041	482077.00	2353469.00	638.12
16	T-049	482833.68	2354497.01	748.11
17	T-056	484823.53	2359154.13	975.88
18	T-062	486916.27	2359755.31	893.34
19	T-067	488520.86	2359101.91	1025.12
20	T-071	491227.00	2358503.00	1242.87
21	T-078	493666.00	2358450.00	1673.24
22	T-087	496540.00	2358581.00	1404.60
23	T-092	498195.00	2359378.00	1093.07
24	T-095	499569.94	2359758.74	765.88
25	T-097	500107.00	2359624.00	671.97
26	T-100	501197.35	2359727.18	535.44
27	T-105	502600.82	2360300.37	448.83
28	T-106	502790.82	2360230.37	456.44
29	T-107	502820.36	2360099.75	456.81
30	T-108	502780.89	2360025.03	457.54

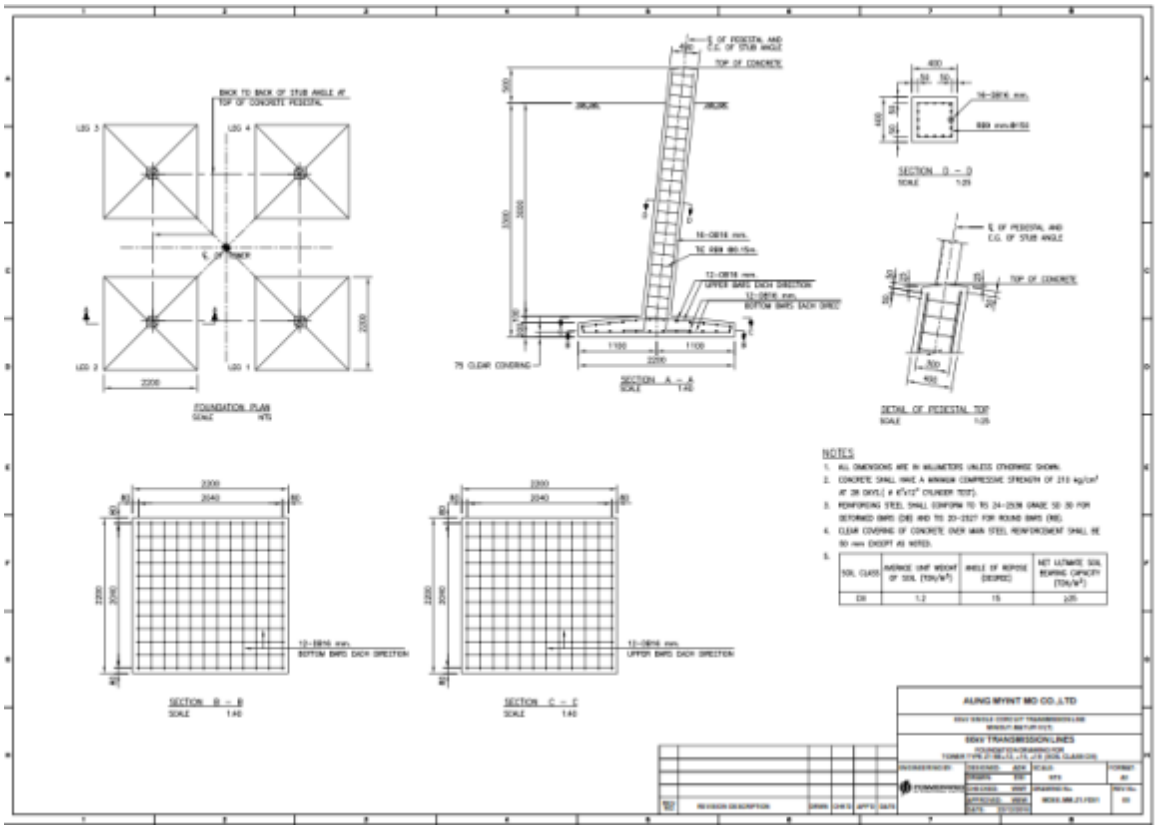
MongPyin-KengTon Section Angle Tension Tower Location List

Sr.	Tower Number	Position-UTM; WGS 84 (47Q) Easting	Northing	Elevation
1	T-001	502741.49	2359968.96	456.70
2	T-001A	502868.86	2360022.41	455.49
3	T-004	503507.76	2360009.30	528.53
4	T-007	504882.23	2359451.25	551.16
5	T-008	505742.21	2359320.67	603.55
6	T-019	509455.00	2360574.00	776.82
7	T-023	511060.62	2362114.61	854.43
8	T-025	512545.00	2362663.00	934.10
9	T-027	513643.00	2362289.00	911.70
10	T-034	515571.00	2359753.00	975.71
11	T-036	516758.00	2358921.00	922.87
12	T-042	519250.91	2359138.51	945.01
13	T-043	519528.81	2359246.41	927.07
14	T-051	521226.78	2362084.37	1036.87
15	T-057	523081.00	2363281.00	962.04
16	T-059	523943.00	2363609.00	1040.23
17	T-061	524465.00	2363604.00	1134.76
18	T-062	524983.00	2363174.00	1079.52
19	T-067	526392.00	2361643.00	834.97
20	T-070	526911.00	2360527.00	834.87
21	T-074	527737.00	2359174.00	853.93
22	T-077	528561.00	2358394.00	1028.85
23	T-081	529903.00	2357504.00	893.72
24	T-087	532155.00	2356797.00	953.86
25	T-089	533201.00	2356540.00	1124.86
26	T-092	534669.00	2356163.00	1098.73
27	T-094	535823.63	2356183.92	1134.04
28	T-096	536599.00	2356316.00	1040.30
29	T-106	540580.18	2355612.29	1737.14
30	T-110	542255.71	2355187.89	1636.02
31	T-113	543611.26	2355525.84	1857.60
32	T-117	544644.64	2355481.77	1871.09
33	T-123	546463.55	2354251.69	1536.00
34	T-125	547128.57	2353988.70	1593.06
35	T-128	548075.42	2354005.29	1406.89
36	T-130	548892.28	2354124.85	1236.30
37	T-131	549406.48	2354389.44	1186.94
38	T-134	550214.43	2354371.28	1177.99
39	T-136	551103.40	2354278.87	1133.36
40	T-139	551841.42	2354335.39	1045.64
41	T-143	553774.89	2353836.96	999.87
42	T-147	554987.80	2353287.33	958.44
43	T-151	556010.24	2352571.12	937.44
44	T-152	556548.50	2352570.19	957.04
45	T-156	557716.84	2353217.78	936.63
46	T-157	558521.37	2353140.43	927.18
47	T-168	561291.07	2350619.67	1021.18
48	T-176	563877.71	2349218.72	837.35
49	T-178	564605.79	2349090.56	817.16
50	T-179	564950.96	2349256.89	812.67
51	T-181	565427.89	2349428.04	802.61
52	T-186	567147.58	2350032.45	819.11
53	T-193	569920.01	2350688.00	816.20
54	T-194	570111.00	2350853.03	814.72
55	T-195	570093.03	2350954.99	826.63

Figure 1. 2: Protected Public Forest and Reserved forest in Shan State

1.2.3 Designs Sample for power transmission tower

Sample Designs for transmission line and calculation would submit to MOEE after the route line survey and MOEE would approve and Aung Myint Mo Co., Ltd. would start erection of towers and import necessary machinery and equipment. The below figure shows sample tower designs.



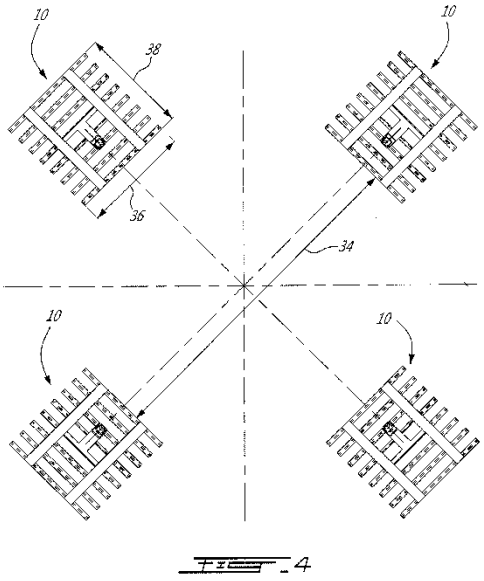


Figure 1. 3: Design samples for power transmission tower

Raw Materials

The main materials used for transmission towers eruption include water, sand and rocks and lubricants, fuels and other hydrocarbons for installation of transmission cable. The water is getting nearby creek by using the water pump and then water will transport to the construction place where the transmission tower constructed. The estimated amount of water used for transmission tower is very small amount for construction of foundation and would be around 3 gallons. The sand and rocks used for transmission tower could be bought from nearest local community who has license for permission. Moreover, suspension insulator, ACSR cable Overhead Earth wire and other necessary equopment will be bought from outsourse suppliers and store in site camp.

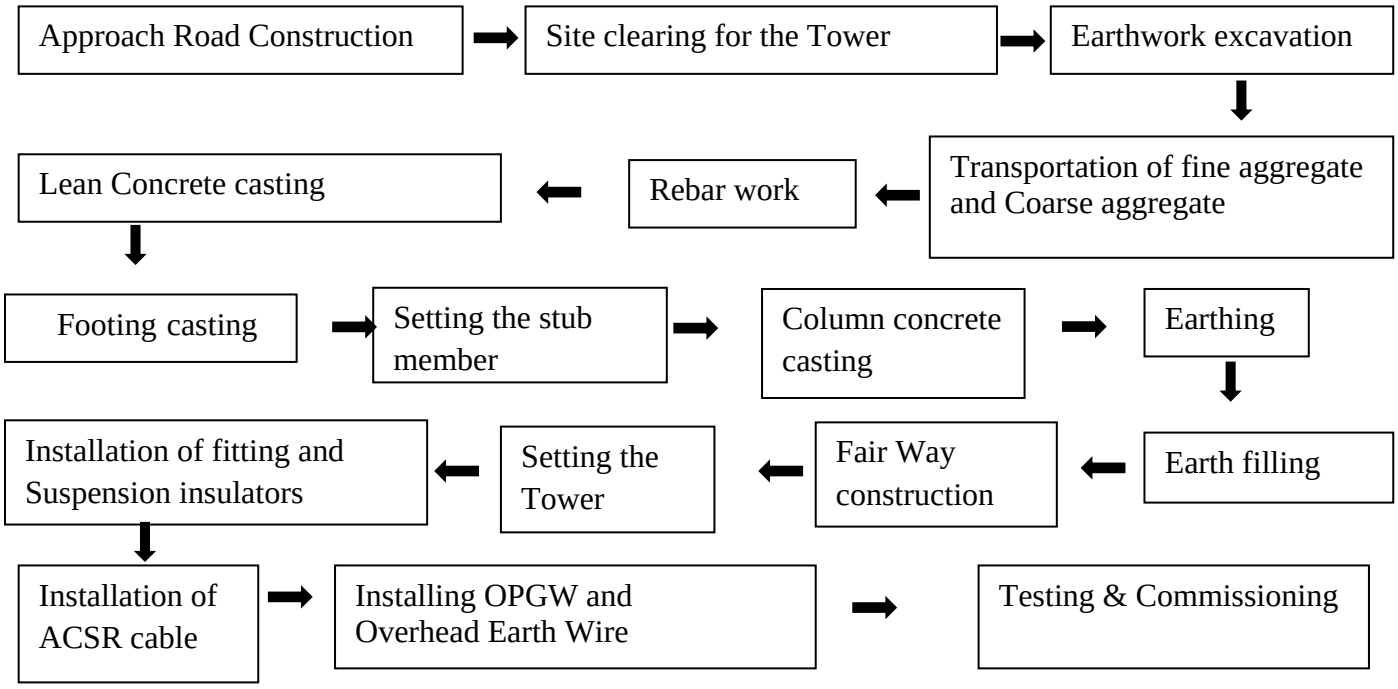
Labour requirements

The skillful workers were organized with 9 groups for the construction of transmission tower. The total labors are 270 persons and 30 persons for each group. There is no permanent labour camp. The labours are lodged at the nearest village; Sin maung village and Hway Hin Village of the working place and then go for working to the working place. There is no much waste during

the setting of the tower. The rules, regulations and instruction were set up for the waste disposal. The waste generated during the working time such as packaging material and carton boxes will be collected and taken back to the lodged house and systematically throw according to Township Development Affair. In the operation phase, department of power transmission and system control (DPTSC) will be carry out for the maintainance and electricity distribution and it is expected that human resources may mainly be civilian staffs of department of power transmission and system control (DPTSC).

Figure:Labour camp

Process Flow Chart



CHAPTER-II DESCRIPTIONS OF PROJECT PROPONENT

2.1 Project Proponent

Proposed project will carry out by Aung Myint Mo Co., Ltd which got by comparing tender system from Ministry of Electricity and Energy. This project has two section and Aung Myint Mo Co., ltd will perform for erection of power transmission tower in section-2. Aung Myint Mo Co., Ltd is 100% citizen investment. Surveyor (U Nay Min, U Aung Pyae Htun) and Aung Myint Mo Company of U Nyi Lin Thein was performed 230kV Namsang-Mongpyin-Keng Teng (TarKaw bridge- Keng Teng Section) Power Transmission Line Route Survey project between 10.8.2016 and 16.8.2016. Power Transmission line is 74.4 miles long.

MONG PYIN - KENG TON

230 kV POWER TRANSMISSION LINE

SPECIFICATION

Detailed information of the proposed organization is as follows:

Name of Company	:	AUNG MYINT MO COMPANY LIMITED
Proponent	:	Zaw Zaw Oo
Designation	:	Managing Director
Business Type	:	Transmission Line installation and construction
Company Address	:	No.212, East Circular Road, Min Ga Lar Oo Quarter, Taunggyi, Myanmar.
Telephone Number/Fax	:	95-081-2123852
Email	:	Zawzawoo.amm@gmail.com.

Table 2. 1: 230 kV Power Transmission Line Specification

Sr.	Particular	Spec.
1	Conductor Type	TERN; ACSR (795 MCM)
2	No. of Conductor per Phase	2
3	No. of Circuit	Double
4	Earth wire	GSW 19/2.7
5	OPGW wire	Similar to GSW 19/2.7
6	Swing Angle	60 Degree
7	Normal Span	400 m
8	Everyday Temperature	28°C
9	Maximum Temperature	75°C
10	Minimum Temperature	10°C
11	Wind Temperature	15°C
12	Maximum Wind Speed	30 m/s
	Cable Tension	
13	Everyday Temp;(28°C) (Initial)	33% of Ultimate
14	Everyday Temp;(28°C) (Creep)	23% of Ultimate
15	Wind Temp;(15°C+Max wind)	40% of Ultimate
16	Clearance	
	Normal Ground	8m (26 ft)

Table 2. 2: Summary of report

Sr.	Particular	Summary
1	Total Line Length	119.84 km (74.4 Miles)
2	Total Number of Section	127 secs
3	Longest Section Length	2.06 km (3.32 Miles)
4	Total Tower Usage	2.69 towers/km (4.3 towers/mile)
5	Tension Tower Usage	129 towers (42.6%)

2.2 Import of Construction Machines

Construction machines, accessories such as wire, insulator would import from foreign country especially from China, Thailand and Japan. Import list is shown in table below.

Table 2. 3: Import list of machines

Item No.	Description	Unit	Qty by Con ;	Qty by Tab;	Remark
I	Survey Work	Mile	77	74.4	
II	Tower Design & Calculation	Lot	1		
III	Foundation Design & Calculation	Lot	1		
IV	Initial Environmental Examination (IEE)	Lot	1		
V	Soil Test	Place	50		
1	**Galvanized Steel Towers.**				
1.1	Suspension Tower DST0-19	Nos.	21	29	
1.2	Suspension Tower DST0-22	Nos.	75	55	
1.3	Suspension Tower DST0-25	Nos.	90	20	
1.4	Suspension Tower DST0-28	Nos.	45	32	
1.5	Suspension Tower DST0-31	Nos.		5	
1.6	Suspension Tower DST0-33	Nos.		11	
1.7	Suspension Tower DST0-35	Nos.		15	
1.8	Suspension Tower DST1-19	Nos.	3		
1.9	Suspension Tower DST1-22	Nos.	12		
1.10	Suspension Tower DST1-25	Nos.	10		
1.11	Suspension Tower DST1-28	Nos.	5		
1.12	Tension Tower DTT1-19	Nos.	12	37	

Item No.	Description	Unit	Qty by Con ;	Qty by Tab;	Remark
1.13	Tension Tower DTT1-22	Nos.	30	29	
1.14	Tension Tower DTT1-25	Nos.	5	11	
1.15	Tension Tower DTT1-28	Nos.		9	
1.16	Tension Tower DTT1-31	Nos.		1	
1.17	Tension Tower DTT2-19	Nos.		9	
1.18	Tension Tower DTT2-22	Nos.	18	11	
1.19	Tension Tower DTT2-25	Nos.	5	1	
1.20	Tension Tower DTT2-28	Nos.	2		
1.21	Tension Tower DTTE-19	Nos.	2		
1.22	Tension Tower DTTE-22	Nos.	1	3	
1.23	Tension Tower DTTE-25	Nos.	2		
1.24	Transposition Tower DTP-22	Nos.	3	3	
1.25	Suspension Tower DST0-19 (S)	Nos.		1	
1.26	Suspension Tower DST0-22 (S)	Nos.		6	
1.27	Tension Tower DTT1-19 (S)	Nos.		9	
1.28	Tension Tower DTT1-22 (S)	Nos.		3	
1.29	Tension Tower DTT1-28 (S)	Nos.		3	
1.30	Tension Tower DTT2-19 (S)	Nos.		3	
	Total No. of tower	Nos.	341	306	
	Maker **Shangdong Dischang**				
	Country of Origin **China**				
	Maker **Power Grid (Design & Calculation)**				
	Country of Origin **Thailand (PLS Software)**				
2	**Tower Accessories.**				
2.1	Earth Rod (Dia:14.2mm x 2440 mm) and Joint	Sets		1500	

Item No.	Description	Unit	Qty by Con ;	Qty by Tab;	Remark
	Metal Powder				
	Maker **Kumwell**				
	Country of Origin **Thailand**				
2.2	Copper clad conductor 50 mm2	kg		3500	
	Maker **Intelli**				
	Country of Origin **Brazil**				
2.5	Cable lug for Copper clad steel conductor 50 mm2	Nos.		1600	
	Maker **Kumwell**				
	Country of Origin **Thailand**				
2.6	Tool Kit for exothermic welding	Sets		7	
	Maker **Kumwell**				
	Country of Origin **Thailand**				
2.3	Danger board	Nos.		341	
2.4	Number plate	Nos.		341	
2.5	Line Designation Label Plate (R.Y.B)	Nos.		25	
	Maker **Soho**				
	Country of Origin **China**				
3	**ACSR Conductor and Accessories**				
3.1	ACSR conductor 795 mcm (Tern)	M/Ton		2180	
3.2	Compression midspan joint for ACSR conductor 795 mcm (Tern)	Nos.		820	
3.3	Repair Sleeve for ACSR conductor 795 mcm (Tern)	Nos.		410	
3.4	Amour rod for ACSR 795 mcm (Tern)	Nos.		3750	
3.5	Spacer 400 mm for ACSR 795 mcm (Tern)	Nos.		12310	
3.6	Vibration Damper (Stockbridge damper) for ACSR 795 mcm (Tern)	Nos.		9002	
	Maker **ZTT**				
	Country of Origin **China**				
4	**Overhead Earth Wire & Accessories.**				

Item No.	Description	Unit	Qty by Con ;	Qty by Tab;	Remark
4.1	Shield wire (Earthing Conductor) GSW 108 mm2	M/To n		120	
4.2	Compression mid span joint for GSW 108 mm2	Nos.		70	
4.3	Suspension set for GSW shield wire	Set		275	
4.4	Tension set for GSW shield wire	Set		170	
4.5	Vibration damper (Stockbridge damper) for GSW shield wire	Nos.		1435	
4.6	Grounding Clamp for GSW shield wire	Nos.		720	
4.7	Shield wire (Earthing Conductor) OPGW 115 mm2	km		135	
4.8	Suspension set for OPGW shield wire	Set		275	
4.9	Tension set for OPGW shield wire	Nos.		215	
4.10	Vibration damper for OPGW shield wire	Set		1435	
4.11	Amour Rod for OPGW shield wire	Nos.		550	
4.12	Down lead clamp for OPGW shield wire	Nos.		260	
4.13	OPGW cable tray	Nos.		45	
4.14	OPGW Joint Boxes	Nos.		43	
4.15	OPGW Terminal Boxes	Nos.		2	
	Maker **ZTT**				
	Country of Origin **China**				
4.16	Danger plate	Nos.		45	
	Maker **Soho**				
	Country of Origin **China**				
5	**<u>Insulator Strings.</u>**				
5.1	230 kV single suspension insulator string with arcing horn	Set		1485	
	for ACSR - Tern, consisting of Hardware &				
	1 x 16 units of disc insulator (Without Insulator).				
5.2	230 kV double suspension insulator string with arcing horn	Set		165	
	for ACSR - Tern, consisting of Hardware &				
	2 x 16 units of disc insulator. (Without Insulator)				

Item No.	Description	Unit	Qty by Con ;	Qty by Tab;	Remark
5.3	230 kV double Tension insulator string with arcing horn	Set		1010	
	for ACSR - Tern, consisting of Hardware &				
	2 x 14 units of disc insulator (Without Insulator)				
5.4	230 kV jumper insulator string with arcing horn	Set		505	
	for ACSR - Tern, consisting of Hardware &				
	1 x 14 units of disc insulator (Without Insulator).				
	Maker **ZTT**				
	Country of Origin **China**				
5.5	Disc Insulator (120kN) Normal Type (Ball & Socket)	Nos		35775	
	Disc Insulator (160kN), Normal Type (Ball & Socket)	Nos		34400	
	Maker **NGK**				
	Country of Origin **Japan**				

Contract No.:189/DPTSC (PTP)(PTP)/2015-2016,

Contract Date:18.07.2016,

Finishing Date: 18.07.2019

CHAPTER-III INITIAL ENVIRONMENTAL EXAMINATION EXPERT TEAM

3.1 Methodology

The study on existing environmental resources in the project area is focused on two main resources-physical and socio-economic resources. The physical resources such as quality of air, and water inside the project are called primary data, which is collected from existing information in the field survey. This data collection is done by direct observation, interviewing and discussion with the responsible persons of Aung Myint Mo Co., Ltd. and sample analyses**.** And then, the primary data for the socio-economic resources is obtained from the local villagers, local key person, relevant ministries/bodies and parliament member of respective townships as reference material for the preparation of EMP report. The impacts are evaluated and mitigation measures developed for those impacts that are identified as significant. Flow Chart of the Methodology for the Environmental Management Plan is shown in **Figure 3.1**.

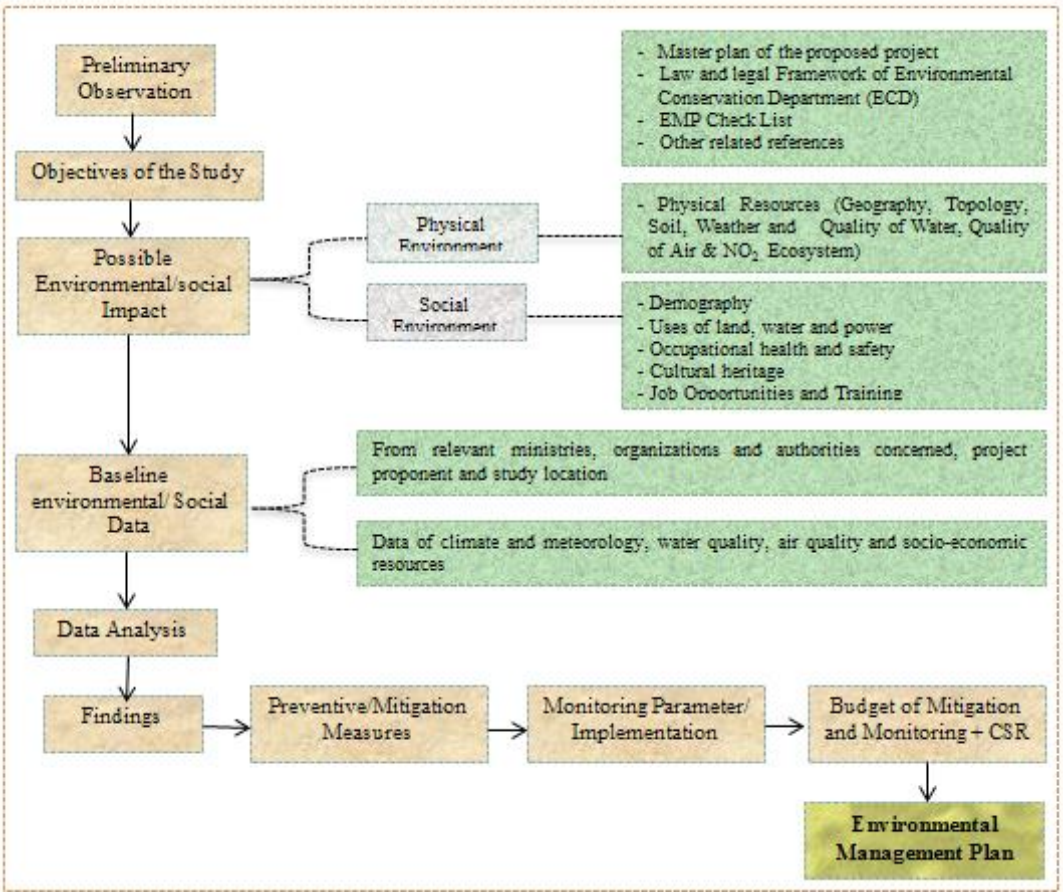


Figure 3. 1: Environmental Management Plan

U Soe Min (Director)

U Soe Min is an acting director at E Guard Environmental Services Co., Ltd. He is a Civil Environmental engineer. He received B.E. (Civil Engineering) from RIT, Yangon, in 1984, and M.E. (Environmental Technology and Management) from AIT, Bangkok, in 2001. He had worked for Irrigation Department, Ministry of Agriculture for 8 Years. He'd involved in local and international projects relating to civil, water resources and environmental projects in Myanmar, Thailand and Singapore. He was an ex-JICA participant, a member of MES, and an AIT alumni. Currently he's undertaking as a director responsible for environmental business development, environmental monitoring and data acquisition, and been involved in ESIA projects as a consultant and project manager.

Daw Moh Moh Khaing (Consultant)

Moh Moh Khaing is a Consultant who holds Transitional Consultant Certificate No 0072, described expertises are Biodiversity and Ecology and Marine Biology and Microbiology. She has Master of Research Degree in Microbiology and Master of Science Degree in Marine Science, University of Pathein, Myanmar, at 2013 and 2012. She has more than 4 years of consulting experience in Environmental and Social Impact Assessment field, which include Planning and Identifying, Coordinating, Ecology and Habitats, Physical and Biological Monitoring, Socio-economic Monitoring, Data Analysis and Technical Report Writing. She also has an experience as Research Fellow in Conservation field. She also participates in the activities of potential impact analysis and reviewing the report in this project.

U Aung Myint Myat (Associate consultant)

Aung Myint Myat is an Associate Consultant, who holds Transitional Consultant Certificate No 0099, described expertises is Forestry. He has Bachelor Degree in Forestry from the University of Forestry in 2014. He has three years experiences on environmental site surveys and also socio-economic surveys. Another experience is to cooperate with clients and to conduct stakeholder engagement and public consultation meeting. He is a team leader of this project and perform analysis of socio-economic condition, reporting this IEE including biodiversity survey, environmental quality measurement survey. He also participates in the activities of social survey, biodiversity survey, public hearing, and reviewing the report in this project.

Jaint Yadanar (Associate Consultant)

Jaint Yadanar is an Associate Consultant, who holds Transitional Consultant Certificate No 0098, described expertises are Biodiversity and Ecology and Socio-economy. She has Bachelor Degree in Forestry from the University of Forestry in 2013. She has experiences on environmental site surveys and also socio-economic surveys. Another experience is to cooperate with clients and to conduct stakeholder engagement and public consultation

meeting. She also participates in the activities of preparation of social survey form, potential impact analysis and reviewing the report in this project.

Aye Nyein Thu (Project Associate)

Aye Nyein Thu is a Project Associate, who received her Bachelor Degree in Forestry from the University of Forestry in 2015. She has two years experiences on environmental site survey and socio-economic surveys. Another experience is to cooperate with clients and to conduct stakeholder's engagement and public consultations. In this project she assisted in surveying socio-economic, biodiversity, environmental quality measurement, data entry and collecting secondary data. She also assists in preparation of Public Consultation such as preparation of invitation list, invitation letter, presenter in PC, take record for attendees.

May Oo (Project Associate)

May Oo is a Project Associate, who received her Bachelor Degree in Forestry from the University of Forestry in 2015. She has two years experiences on environmental site survey and socio-economic surveys. Another experience is to cooperate with clients and to conduct stakeholder's engagement and public consultations. In this project she assisted in surveying socio-economic, biodiversity, environmental quality measurement, data entry and collecting secondary data. She also assists in preparation of Public Consultation such as preparation of invitation list, invitation letter, presenter in PC, take record for attendees.

Khaing May Soe Thaung (Project Associate)

Khaing May Soe Thaung is a Project Assistant, who received her Bachelor Degree in Forestry from the University of Forestry in 2015. She has one-year experiences on environmental site survey and socio-economic surveys. Another experience is to cooperate with clients and to conduct stakeholder's engagement and public consultations. In this project she assisted in surveying socio-economic, biodiversity, environmental quality measurement, data entry and collecting secondary data. She also assists in preparation of Public Consultation such as preparation of invitation list, invitation letter, presenter in PC, take record for attendees.

Naing Zaw Win (Project Assistant)

Naing Zaw Win is a Project Assistant, who received his Bachelor Degree in Forestry from the University of Forestry in 2015. He has one-year experiences on environmental site survey and socio-economic surveys. Another experience is to cooperate with clients and to conduct stakeholder's engagement and public consultations. In this project he assisted in surveying socio-economic, biodiversity, environmental quality measurement, data entry and collecting secondary data. He also assists in preparation of Public Consultation such as preparation of invitation list, invitation letter, presenter in PC, take record for attendees.

Shwe Ya Min Bo (Project Assistant)

Shwe Ya Min Bo is a Project Assistant, who received her Bachelor Degree in Forestry from the University of Forestry in 2016. She has one-year experiences on environmental site survey and socio-economic surveys. Another experience is to cooperate with clients and to conduct stakeholder's engagement and public consultations. In this project she assisted in surveying socio-economic, biodiversity, environmental quality measurement, data entry and collecting secondary data. She also assists in preparation of Public Consultation such as preparation of invitation list, invitation letter, presenter in PC, take record for attendees.

Ye Yint Aung (Project Assistant)

Ye Yint Aung is a Project Assistant, who received her Bachelor Degree in Port and Harbour Engineering from the Myanmar Maritime University in 2016. He has experiences on environmental site survey and socio-economic surveys. Another experience is to cooperate with clients and to conduct stakeholder's engagement and public consultations. In this project he assisted in surveying, biodiversity, environmental quality measurement, data entry and collecting secondary data. He also assists in preparation of Public Consultation such as preparation of invitation list, invitation letter, presenter in PC, take record for attendees.

Aung Moe Oo (Project Assistant)

Aung Moe Oo is a Project Assistant, who received his Bachelor Degree in Chemical Engineering from Technological University in 2016. He has experiences on environmental site survey and socio-economic surveys. Another experience is to cooperate with clients and to conduct stakeholder's engagement and public consultations. In this project he assisted in surveying socio-economic, biodiversity and data entry.

U Pyae Phyoe Maung (Operational Associate)

U Phyo Phyoe Maung is an operational associate with more than 4 years of experience. He specializes in environmental quality such as air quality, noise and etc. He is also responsible for data analysis and interpretation of environmental baseline data.

U Si Thu Lwin (Surveyor)

U Sithu Lwin is a matriculate and has more than 2 years of surveyor experience. He specializes in instrumentation and field data collection of environmental condition of the site and measuring of environment baseline data.

The full address of the company conducting

E Guard Environmental Services Co.,Ltd

No. 11, Airport Avenue,

10 Mile, InseinTownship,Yangon 1011, Myanmar.

Tel: +95 1, 667953, Fax: +95 1 667953

URL: www.eguardservices.com

CHAPTER-IV NATIONAL LAWS AND REGULATIONS

National laws, rules and regulations of the Republic of the Union of Myanmar are shown in Table (4.1) to be abided by the project proponent/investor regarding the prevention/mitigation of environmental impacts. The Environmental Conservation Law (2012) is the main governing law and the Environmental Conservation Department (ECD) is the prime governing body for law enforcement. Other relevant policy/law include the Constitution (2008), National Environmental Policy (1994), Environmental Conservation Rules (2014) to be abided in the process of Environmental Impact Assessment and Initial Environmental Examination. As a power transmission line construction and operation project, the project proponent shall also comply with the social security law (2012) and labor organization law (2011) and other relevant laws. On top of that, the investor shall fully aware and abide the forest law (1994) as its planned area is situated near the plantation areas. The project proponent will also abide the Conservation of Water Resources and River Law as its planned transmission line route will cross two rivers. In addition, the project proponent shall follow the IFC environmental, health and safety (EHS) guidelines (2007), IFC guidelines on water and sanitation (2007), IFC guidelines on waste management facilities (2007), IFC guidelines for electric power transmission (2007).

4.1 National Laws and regulation in Myanmar related with proposed project

Laws and Regulations	Description
Constitution of the Republic of the Union of Myanmar (2008)	
Section 45	The Union shall protect and conserve natural environment.
Section 390 (b)	Every citizen has the duty to assist the Union carrying out the environmental conservation.
National Environmental Policy (1994)	
National Environmental Policy (1994)	To achieve harmony and balance between socioeconomic, natural resources and environment through the integration of environmental considerations into the development process enhancing the quality of the life of all its citizens.
National Land Use Policy (2016)	
Objectives	(a) To promote sustainable land use management and protection of cultural heritage areas, environment, and natural resources for the interest of all people in the country; (b) To strengthen land tenure security for the livelihoods improvement and food security of all people in both urban and rural areas of the country; (c) To recognize and protect customary land tenure rights and procedures of the ethnic nationalities; (d) To develop transparent, fair, affordable and independent dispute resolution mechanisms in accordance with rule of law;

	(e) To promote people centered development in land resources and accountable land use administration in order to support the equitable economic development of the country; (f) To develop a National Land Law in order to implement the above objectives of National Land Use Policy.
Environmental Conservation Law (2012)	
Objectives: Section 3	(c) To enable to emerge a healthy and clean environment and to enable to conserve natural and cultural heritage for the benefit of present and future generations; (d) To reclaim ecosystems as may be possible which are starting to degenerate and disappear; (e) To enable to manage and implement for decrease and loss of natural resources and for enabling the sustainable use beneficially;
Provisions of Duties and Powers relating to the Environmental Conservation of the Ministry: Section 7	(a) To specify categories and classes of hazardous wastes generated from the production and use of chemicals or other hazardous substances in carrying out industry, agriculture, mineral production, sanitation and other activities; (b) To prescribe categories of hazardous substances that may affect significantly at present or in the long run on the environment; (c) To promote and carry out the establishment of necessary factories and stations for the treatment of solid wastes, effluents and emissions which contain toxic and hazardous substances; (j) To prescribe the terms and conditions relating to effluent treatment in industrial estates and other necessary places and buildings and emissions of machines, vehicles and mechanisms; (m) To lay down and carry out a system of EIA and SIA as to whether or not a project or activity to be undertaken by any Government department, organization or person may cause a significant impact on the environment; (o) To manage 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.
Environmental Quality Standards: Section10	The Ministry may, with the approval of the Union Government and the Committee, stipulate the following environmental quality standards: (a) Suitable surface water quality standards in the usage in rivers, streams, canals, springs, marshes, swamps, lakes, reservoirs and other inland water sources of the public; (b) Water quality standards for coastal and estuarine areas; (c) Underground water quality standards; (d) Atmospheric quality standards;

	(e) Noise and vibration standards; (f) Emissions standards; (g) Effluent standards; (h) Solid wastes standards; (i) Other environmental quality standards stipulated by the Union Government. The Ministry shall, under the guidance of the Committee, maintain a comprehensive monitoring system and implement by itself or in co-ordination with relevant Government departments and organizations in the following matters: a) The use of agro-chemicals which cause to impact on the environment significantly; b) Transport, storage, use, treatment and disposal of pollutants and Hazardous substances in industries; c) Disposal of wastes which come out from exploration, production and treatment of minerals, industrial mineral raw materials and gems; d) Carrying out waste disposal and sanitation works; e) Carrying out development and constructions; f) Carrying out other necessary matters relating to environmental pollution.
Monitoring: Section13	Environmental Conservation Law (2012): Responsibilities of project proponent/ business owner for reducing environmental impact
Section 14	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.
Section 15	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 environ -mental pollution. If it is impracticable, it shall be arranged to dispose the wastes in accord with environmentally sound methods.
Section 16	A person or organization operating business in the industrial estate or business in the SEZ or category of business stipulated by the Ministry: (a) Is responsible to carry out by contributing the stipulated cash or kind in the relevant combined scheme for the environmental conservation including the management and treatment of waste; (b) Shall contribute the stipulated users' charge s or management fees for the environmental conservation according to the relevant industrial estate, SEZ and business organization; (c) Shall comply with the directives issued for environmental conservation according to the relevant industrial estate, SEZ or

	business.
Environmental Conservation Rules (2014)	
Rules 51	The Ministry shall assign duty to the Department for enabling to adopt and carry out the environmental impact assessment system.
Rules 52	The Ministry shall determine the categories of plan, business or activity which shall carry out environmental impact assessment
Rules 53	The Ministry shall scrutinize whether or not it is necessary to conduct environmental impact assessment, determine the proposed plans, businesses or activities which do not include in stipulation under rule 52
Rules 56	The person who carries out any project, business or activity shall arrange and carry out for conducting the environmental impact assessment for any project, business or activity by a qualified third person or organization accepted by the Ministry.
Rules 58	The Ministry shall form the Environmental Impact Assessment Report Review Body with the experts from the relevant Government departments, Government organizations.
Rules 60	The Ministry may assign duty to the Department to scrutinize the report of environmental impact assessment prepared and submitted by a third person or organization relating to environment impact assessment and report through the Environmental Impact Assessment Report Review Body.
Rules 61	The Ministry may approve and reply on the environmental impact assessment report or environmental management plan with the approval of the Committee.
Rules 69	Any person shall not emit, cause to emit, dispose, cause to dispose, pile and cause to pile, by any means, the pollutants and the hazardous waste or hazardous material stipulated by notification under the Law and any of these rules at any place, which may affect the public directly or indirectly. Any person shall not carry out to damage the ecosystem and the natural environment, which is changing due to such system, except for carrying out with the permission of the Ministry for the interest of the people of these rules at any place, which may affect the public directly or indirectly. . Any person shall not carry out to damage the ecosystem and the natural environment which is changing due to such system, except for carrying out with the permission of the Ministry for the interest of the people
Environmental Impact Assessment Procedures (2015)	
Screening: Section 23	(a) The project proponent shall submit the Project Proposal to the Ministry for Screening. (b) The Ministry will send the Project Proposal to the Environmental

	Conservation Department to determine the need for environmental assessment. (c) Following the preliminary Screening and verification that the Project Proposal contains all required documents and related materials, subject to Articles 8, 9, 10, 11, 26 and 27 the Department shall make a determination in accordance with Annex 1 ' Categorization of Economic Activities for Assessment Purposes', taking into account Article 25 and the additional factors listed in Article 28 in order to designate the Project as one of the following, and then submit it to the Ministry: -An EIA Type Project, or -An IEE Type Project, or -A Non IEE or EIA Type, and therefore not required to undertake any environmental assessment.
Screening: Section 24	Ministry shall also make a determination whether an EMP shall be required in respect of any Project.
Screening: Section 29	Within fifteen (15) working days of receiving the complete Project Proposal, the Department shall determine the type of environmental assessment (EIA, IEE, or none) which the Project will require, and the Department shall inform the Project Proponent in writing as to such determination in accordance with the Ministry guidance.
National Environmental Quality (Emission) Guidelines (2015)	
Objectives	To provide the basis for regulation and control of noise and vibration , air emissions, and liquid discharges from various sources in order to prevent pollution for purposes of protection of human and ecosystem health.
Implementation Procedures: Section 13	Air emissions, noise, odor, and liquid/effluent discharges will be sampled and measured at points of compliance as specified in the project EMP and ECC.
Land Acquisition Act (1894)	
• This British era act is still effective at present due to the lack of new legislation relevant to land acquisition. The Act stipulates that the government could acquire a land, if it was deemed to be in the interest of the public. Religious lands such as pagodas, statues, shrines, and cemeteries were not subject for acquisition. • Stipulates that the government holds rights to take over land provided that compensation is made to the original land owner. • States that no private ownership of land is permitted and that all land must be leased from the State.	
The Land Nationalization Act (1953)	
	• With some exceptions stipulates that all types of agricultural land are owned by the President.

	・Mentions that in case of a breach of the regulations, even the land exempted from government confiscation will be forfeited to the country without compensation. ・States that the President reserves rights to decide the crops to be grown on agricultural lands.
Foreign Investment Rules (2013)	
Rule 54	The promoter or investor shall: (a) Comply with Environmental Protection Law in dealing with environmental protection matters related to the business; (b) Shall carry out socially responsible investment in the interest of the Union and its people; (c) Shall co-operate with authorities for occasional or mandatory inspection; (d) Shall exercise due diligence to be in conformity and harmony with norms and standards prescribed by relevant Union Ministry in conducting construction of factories, workshops, buildings, and other activities; (e) Shall enforce Safety and Health
Duties and Rights of the Investor: Section 15	(a) Abiding by the provisions of this Law, terms and conditions contained in the rules, procedures, notifications, orders, directives and permits issued under this Law; (e) Informing immediately to the commission if natural mineral resources or antique objects and treasure trove which are not related to the permitted business and not included in the original contract, are found above and under the land on which he is entitled to lease or use, continuing to carry out business on such land if the commission allows, and transferring and doing at the substituted place if the permission of continuing to carryout is not obtained; (f) Carrying out not to cause environmental pollution, damage in accord with existing Laws in respect of investment business; (k) Entitle to apply to the commission to obtain more benefit for the invention of new technologies, the enhancement of product quality, the increase in the production of goods and the reduction of environmental pollution is investment business carried out under the permit;
The Protection and Preservation of Cultural Heritage and Region Law	
Chapter 2	3. The objectives of this Law are as follows:- (a) To implement the protection and preservation policy with respect to perpetuation of cultural heritage that has existed for many years; (b) To protect and preserve the cultural heritage regions and the cultural heritage therein so as not to deteriorate due to natural disaster or man-made destruction;

	(c) To uplift hereditary pride and to cause dynamism of patriotic spirit of citizens by protecting and preserving the cultural heritage regions; (d) To promote public awareness and will as to the high value of the protection and preservation of the cultural heritage regions; (e) To protect the cultural heritage regions from destruction; (f) To carry out protection and preservation of the cultural heritage regions in conformity with the International Convention approved by the State.
Chapter 4- Protecting and Preserving the Cultural Heritage Region	6. The Ministry of Culture may cause to be dismantled a building which is not an ancient monument and which obstructs the view of an ancient monument or surrounding natural landscape within the cultural heritage region. 8. The Ministry of Culture may determine region wise the conditions to be observed in the construction of buildings in the cultural heritage region.
Chapter 7- Prohibitions	22. 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.
Chapter 8- Offences and Penalties	25. Whoever violates any provision of sub-section (b) of section 19, section 22 or section 23 shall, on conviction be punished with fine which may extend-to kyats 30,000 or with imprisonment for a term which may extend to 3 years or with both.
Forest Law (1992)	
Section 17	Forest produce may only be extracted after obtaining a permit. However, if it is for domestic or agricultural or piscatorial use not a commercial scale, forest produce may be extracted an amount not exceeding the stipulated quantity, without obtaining a permit.
Section 21	A person who has obtained permission for extraction of forest produce shall:- a) Abide by the conditions contained in the permit; b) Abide by the orders, directives, prohibitions and restrictions issued by the Forest Department in accordance with this Law; c) Pay the royalties, security deposits and advances due; d) Affix the mark after measuring in the manner prescribed or affix the property- mark which has been registered.
Section 30	A private entrepreneur who is desirous of establishing a sawpit, sawmill, tongue-and groove mill, plywood mill, veneer mill, wood-based industry with the exception of wood-based cottage industries and furniture industries has the right to establish the same only after obtaining a permit from the Forest Officer empowered for this purpose.
Chapter-12 Offences And	Whoever commits any of the following acts shall, on conviction be punished with fine

Penalties Section 40	which may extend to kyats 5,000 or with imprisonment for a term which may extend to 6 months or with both: (a) Trespassing and encroaching in a reserved forest; (b) Pasturing domestic animals or permitting domestic animals to trespass in a reserved forest; (c) Breaking up any land, clearing, digging or causing damage to the original condition of the land without a permit in a reserved forest; (d) Causing damage to a water-course, poisoning in the water, using chemicals or explosives in the water in a reserved forest; (e) Catching animals, hunting or fishing in a reserved forest; (f) Kindling, keeping, carrying any fire or leaving any fire burning which may set fire to the forests in a reserved forest; (g) Moving forest produce without submitting to examination at the revenue station; (h) Violating any provision of the rule, procedure, order, directive or notification issued under this Law.
Protection of Wildlife and Protected Areas Law (1994)	
Section 35	(a) Hunting without a license; (b) Violation of any condition of the hunting license; (c) Raising without permission, for commercial purpose normally protected wild animals and seasonally protected wild animals; (d) Causing water and air pollution, causing damage to a water-course or putting poison in the water in a natural area; (e) possessing or disposing of pollutants or mineral pollutants in a natural area; (f) Establishing and operating a zoological garden or a botanical garden without a license.
Section 37 (a)	Killing, hunting or wounding a completely protected wild animal without permission, possessing, selling, transporting or transferring such wild animal or any part thereof without permission;
Labor Organization Law (2011)	
Rights and Responsibilities of the Labor Organization: Section 17	The labor organizations 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 programs. The labor organizations have the right to negotiate and settle with the employer if the workers are unable to obtain and enjoy the rights of the workers contained in the labor laws and to submit demands to the employer and claim in accord with the relevant law if the agreement cannot be reached.
Section 18	The labor organization has 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 reasons of such dismissal were based

	on labor organization membership or activities, or were not inconformity with the labor laws.
Section 19	The labor organizations have the right to send representatives to the Conciliation Body in settling a dispute between the employer and the worker. Similarly, they have the right to send representatives to the Conciliation Tribunals formed with the representatives from the various levels of labor organizations.
Section 20	In discussing with the Government, the employer and the complaining workers in respect of worker's rights or interests contained in the labor laws, the representatives of the labor organization also have the right to participate and discuss.
Section 21	The labor organizations have the right to participate in solving the collective bargains of the workers in accord with the labor laws.
Section 22	The labor organizations shall carry out peacefully in carrying out holding of meetings, going on strike and carrying out other collective activities in accord with their procedures, regulations, by-laws and any directives prescribed by the relevant Labor Federation.
Section 23	The labor organizations shall assist in making agreements relating to management of works, individual employment agreements, bonds and other individual agreements between the employer and the workers.
Duties of Employer: Section 29	The employer shall recognize the labor organizations of his trade as the organizations representing the workers.
Section 30	The employer shall allow the worker who is assigned any duty on the recommendation of the relevant executive committee to perform such duty not exceeding two days per month unless they have agreed otherwise. Such period shall be deemed as if he is performing the original duty of his work.
The Social Security Law (2012)	
Objectives	(a) Causing to support the development of the State's economy through the increase of production to enjoy more security in social life and health care of workers who are major productive force of the Union by the collective guaranty of the employer , worker and the Union for enabling to fulfill health and social needs of the workers; (b) Causing to enjoy more security in social life and health care by the public by their voluntary insurance; (c) Causing the raise of public reliance upon the social security system by providing benefits which are commensurate with the realities; (d) Causing to have the right to draw back some of the contributions paid by the employers and the workers as savings, in accord with the stipulations; (e) Causing to obtain the right to continued medical treatment, family

	assistance benefit, invalidity benefit, the right to residency and ownership of housing after retirement in addition to health care and pecuniary benefit for sickness, maternity, and decease and employment injury of the workers.
Article 53	The employers and workers shall co-ordinate with the Social Security Board or insurance agency in respect of keeping plans for safety and health in order to prevent employment injury, contracting disease and decease owing to occupation and in addition to safety and educational work of the workers and accident at the establishment.
Public Health Law (1972)	
Objectives	To ensure the public health include not only employees but also resident people and cooperation with the authorized person or organization of health department. It is concerned with the protection of peoples' health by controlling the quality and cleanliness of food, drugs, environmental sanitation, epidemic diseases and regulation of private clinics. The project owner will cooperate with the authorized person or organization in line with the section 3 and 5 of said law.
Section 3	The project owner will abide by any instruction or stipulation for public health.
Section 5	The project owner will accept any inspection, anytime, anywhere if it is needed.
Commercial Tax Law (2014)	
Section 4	Commercial tax as specified in the Schedule shall be imposed on anybody engaging in the following activities: (a) Domestic manufacturing and distribution, (b) Importing, (c) Trading, (d) Providing services.
Section 5	The tax under section 4 C)shall be paid by the manufacture or importer of Special Goods
Myanmar Engineering Council Law (2013)	
Objectives	a) To develop the dignity, ethical principles and ability of Myanmar citizen engineers, graduate technologists and technicians who are working in the engineering services sector; b) To explore beneficial, useful and good methods to research and develop the State's natural resources and human resources with the least environmental impact by a combination of engineering technology and information technology; c) To guide, control, maintain and take necessary action with regard to specified standards and norms relating to specified subjects, systematic methods, safety and

<table>
<tr><td></td><td>ethical principles and duties in teaching engineering subjects and in technological research and services;
d) To perform engineering and technological activities of the State and tasks assigned by the relevant ministry or organization from time to time</td></tr>
<tr><td colspan="2">The Underground Water Act (1930)</td></tr>
<tr><td></td><td>According to Act the President of the Union may, by notification, direct and shall apply only to the tubes, exceeding a depth to be prescribed the President of the Union and may prescribe different depths for different local areas.
Accordingly, “underground water” means water obtained from below the surface of the ground by the sinking of tubes. It is also stated that no person shall sink a tube for the purpose of obtaining underground water except under and in accordance with the terms of a license granted by the water officer, an officer by notification prescribed on his behalf.</td></tr>
<tr><td colspan="2">Union Tax Law (2014)</td></tr>
<tr><td>Commercial Tax:
Section 5</td><td>According to the Section 6 of the commercial Tax Law, the schedules to this law are amended and stipulated as follows-
Schedules to the Commercial Tax Law
) Whoever produces and sells any goods within the country with the exception of the goods mentioned in the following paragraph (b) and (c), shall pay 5% commercial tax on the sale proceeds or, if the goods are imported , on the landed costs;
) If goods contained in the following schedule are imported, the tax shall be charged on the sale proceeds at the specified percentage.
<table>
<tr><th>Sr.</th><th>Description of the goods</th><th>Tax %</th></tr>
<tr><td>1.</td><td>Teak and other hardwood species logs and conversions</td><td>25</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Myanmar Investment Law (2016)</td></tr>
<tr><td>Objectives:
Section 3</td><td>(a) To develop responsible investment businesses which do not cause harm to the natural environment and the society for the benefit of the Union and its citizens;
(b) To protect the investors and their investments in accordance with the law;
(c) To create job opportunities for the people;
(d) To develop human resources;
(e) To develop high functioning production, service, and trading sectors.
(f) To develop technology and the agriculture, livestock and industrial sectors;
(g) To develop various professional fields including infrastructure</td></tr>
</table>

	across the Union; (h) To enable the citizens to be able to work alongside with the international community; and (i) To develop businesses and investments that meet international standards.
Submitting Proposal: Section 36	The investor shall submit a proposal to the Commission and invest after receiving the Permit in the following businesses; (a) Businesses /investment activities that are strategic for the Union and (b) Large capital intensive investment projects (c) Projects which have large potential impact on the environment and the local community, (d) Businesses/ investment activities which used state-owned land and building (e) Businesses/ investment activities which are designated by the government to require the submission of a proposal to the Commission.
Employment of Staff and Workers: Section 51	The investor: (a) May appoint a qualified person of any citizenship in the investor's investment within the Union as senior manager, technical and operational expert, and advisor in accordance with applicable laws; (b) Shall arrange to provide capacity building programs in order to be able to appoint citizens to positions of management, technical and operational experts, and advisors; (c) Shall appoint only citizens for the works which does not require skill; (d) Shall appoint skilled citizen and foreign workers, technicians, and staff by signing an employment contract between employer and employee in accordance with the existing labor laws and rules; (e) Shall ensure the entitlements and rights contained in applicable labor laws and rules including minimum wages and salary, leave, holiday, overtime fee, damages, workman's compensation, social welfare, and other insurance relating to workers by stipulating the rights and duties of employers and employees and other employment terms and conditions contained in the employment contract; and (f) Shall settle disputes arising amongst employers, amongst workers, between employers and workers, between workers and technicians or staff in accordance with applicable laws.
Responsibilities of Investors: Section 65	The Investor - (a) Shall respect and comply with the customs, traditions and culture of the national races in the Union; (b) Shall establish and register a company or sole proprietorship or legal entities or branches under the applicable laws in order to invest;

	(c) Shall abide by the rules and stipulations of special licenses, permits, and business operation certificates issued to them, including the rules, procedures, notifications, orders and directives issued under applicable laws and this law terms and conditions of contract and tax obligations; (d) Shall carry out in accordance with the stipulations of department concerned if it is required by the nature of business or other need to obtain any license or permit from the relevant Union Ministries, governmental bodies and organizations, or to carry out registration; (e) Shall immediately inform to the Commission if natural mineral resources or antique objects and treasure trove, which are not related to the permitted business and not included in original contracts, are found above and under the land on which the investor is entitled to lease or use. If the Commission allows shall continue to carry out business on such land, and carry out the business at the substituted place which is selected and submitted by the investor if not applicable; (f) Shall not make any significant alteration of topography or elevation of the land on which he is entitled to lease or has rights to use, without the approval of the Commission; (g) Shall in relation to the investment business, abide by applicable laws, rules, procedures and best standards practiced internationally so as not to cause damage, pollution, loss to the natural and social environment and not to cause damage to cultural heritage; (h) Shall prepare and keep proper records of books of account and annual financial statement, and necessary financial matters relating to the investments which are performed by permit or endorsement in accordance with internationally and locally recognized accounting standards; (i) Shall discontinue the business 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; (j) Shall pay wages and salaries to employees in accordance with applicable laws, rules, procedures and directives during the period of suspension of business for a concrete reason; (k) Shall pay compensation and indemnification in accordance with applicable laws to the relevant employee or his/her successor for injury, disability, disease and death due to the work; (l) Shall supervise foreign experts, supervisors and their families, who employ in investment, to abide by applicable laws, rules, orders and directives, and the customs and traditions of Myanmar; (m) Shall respect and comply with existing labor laws;

	(n) Shall have the right to sue and be sued in accordance with laws; (o) Shall pay effective compensation for loss incurred to victim, if the investor causes damage to the natural environment and causes socioeconomic losses, such as that caused by logging or extraction of natural resources, which are not related to the scope of the permitted investment, except from carrying out the activities which are required to conduct investment which includes in a Permit or an Endorsement. (p) If the investor received the prior notice for inspection from Commission, investor shall allow the Commission to inspect in any places related with the investment. (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.
Insurance: Section 73	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.
The Settlement of Labor Dispute Law, 2012	
	The Pyidaungsu Hluttaw hereby had enacted this Law for safeguarding the right of workers or having good relationship between employer and workers and making peaceful workplace or obtaining the rights fairly, rightfully and quickly by settling the dispute of employer and worker justly.
Chapter- 2 Formation of the Workplace Coordinating Committee	3. In any trade in which more than 30 workers are employed, the employer, with the view to negotiating and concluding collective agreement, shall:) If there is any labor organization, form the Workplace Coordinating Committee with the view to make a collective bargaining as follows: i) Two representatives of workers nominated by each of the labor organizations; ii) An equivalent number of representatives of employer;) If there is no labor organization, form the Workplace Coordinating Committee as follows:) Two representatives of workers elected by them; 5. The Coordinating Committee shall promote the good relationship between the employer and worker or labor organization, negotiation and coordination on the conditions of employment, terms and conditions and occupational safety, health, welfare and productivity. 6. (a) If the worker or labor organization or the employer, by

	themselves or by representative, request and complain their grievances to the Coordinating Committee, it shall be negotiated and settled by the Coordinating Committee within five days, not including the official holidays, from the day of the receipt of the request. (b) The Coordinating Committee shall keep the record of settlement and shall send report on the situation of performance in accord with the stipulation to the relevant Conciliation Body.
Chapter-3 Formation of the Conciliation Body	10. The Region or State Government shall form the Conciliation Body in the townships.
Chapter-4 Formation of the Dispute Settlement Arbitration Body	16. (a) The Ministry shall, with the approval of the Union Government, form the Dispute Settlement Arbitration Body in the Regions or States.
Chapter-5 Formation of Dispute Settlement Arbitration Council	19. The Ministry shall, with the approval of the Union Government, form the Dispute Settlement Arbitration Council with 15 qualified persons of good standing from legal experts and experts in labour affairs.
Chapter-6 Settlement of Dispute	23. A party, employer or worker, may complain individual dispute relating to his grievance to the Conciliation Body and if he is not satisfied with the conciliation of such body in accord with stipulated manners, may apply to the competent court in person or by the legal representative.
Vehicle Law (2015)	
Section 3	3. Objectives are as follows: a) To drive safely in public areas, vehicles should be checked according to specifications and provide registration. b) To provide license for drivers after testing prescribed skills for different kinds of vehicles, c) To have easy access and safety for road users d) To use technology for advanced transportation to prevent from traffic congestion and road safety. e) To reduce environmental impacts caused by vehicles.
Section 4	Vehicle owner must register his vehicle from registration officer.
Section 5	Vehicle owner must have regular maintenance of his vehicle according to guidelines to drive it safely.
Section 6	Registration officer must not allow registering a vehicle due to vehicle

	engine defects or not meeting the requirements of Section 5, or not in line with the specifications of vehicle rules under Vehicle Law or not mentioning for the previous license application.
Section 9	The department must classify types of vehicle depending on structural form and load capacity of a vehicle.
Section 11	Vehicles used for business must be registered as rental vehicles.
Section 45	No one must stop or drive a vehicle in public areas under the following conditions (a) If the vehicle is without registration. (b) Registration of the vehicle has been expired, confiscated, or not described according to guidelines. (c) Registration has been canceled or expired.
Section 46	No one should use or be allowed to use its vehicle in public areas without having insurance for public safety. This restriction should not concern with passengers.
Section 47	(a) Only those with driving license in hand should allow to drive in public areas (b) No one should be allowed to drive in public areas without driving license (c) No vehicle owner or in charge of vehicle should allow to drive the vehicle by anyone who do not have vehicle license.
Section 48	No one should drive a vehicle that is not allowed in the vehicle license in public areas.
Section 49	No one should do any of the following in public areas (a) Driving with over-speed or driving with under-speed, (b) Driving an unsafe vehicle, (c) Driving under the influence of alcohol or taking drugs.
Section .58	(a) Anybody who violates prohibitions contained in Section 45,46,47 (b) and (c), 48,49 and 50 (b) shall be punished with imprisonment for a term not more than one month or with fine not more than Kyats fifty thousand or with both. (b) Anybody who violates prohibitions contained in Section 50 (a) shall be punished with imprisonment for a term not more than three months or with fine not more than Kyats five hundred thousand or with both. (c) Anybody who violates prohibitions contained in Section 58 (a) again within one year, shall be punished with imprisonment for a term not more than three months or with fine not more than Kyats one hundred thousand with both.
Vehicle Rules (1989)	
Section 4	3. Central Registration Team is in charge of providing registration of vehicles. This team can transfer its authority to the Registration Team.

Section 5	4. Vehicles other than those which are described in Vehicle Rule 6 must be registered by Registration Team.
Section 6	6. Vehicles which do not need registration are as follows:
Section 7	7. (a) Registration period of a vehicle should be in line with the period fixed by Central Registration Team. Expiry date must be the last day of that period.
Section 9	9. Checking of a vehicle- (a) Registration Team must check a vehicle prior to registration of a vehicle, before the renewal of the registration and according to requirements of Section 5.
Section 56	56. (a) A person must have a legal license to drive any vehicle in public areas. This license must be for the respective vehicle only. 56. (b) No one should have more than one license adopted by this section.
Section 58	58. Types of driving licenses are as follows: (d) "Ga Gyi" license is for private heavy-duty vehicles and private-buses including taxis and funeral-services vehicles, (e) "Nga" license is for any hired vehicles, (f) "Tha" license is for vehicles used for training.
The Conservation of Water Resources and River Law(2006)	
Chapter- 2 Aims	3. The aims of this Law are as follows; (a) To conserve and protect the water resources and rivers system for beneficial utilization by the public; (b) To smooth and safety waterways navigation along rivers and creeks; (c) To contribute to the development of State economy through improving water resources and river system; (d) To protect environmental impact.
Chapter- 5 Prohibitions	8. No person shall: (a) Carry out any act or channel shifting with the aim to ruin the water resources and rivers and creeks. (b) Cause the wastage of water resources willfully. 11. No person shall: (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. (b) Catch aquatic creatures within river-creek boundary, bank boundary or waterfront boundary with poisonous materials or explosives. (c) Dispose of disposal soil and other materials from panning for gold,

	gold mineral dredging or resource production in the river and creek, into the river and creek or into the water outlet gully which can flow into the river and creek. 12. No person shall carry out growing of garden, digging, filling, silt trapping, closing pond, dyke building or erecting spur in the river-creek boundary, bank boundary and waterfront boundary without the permission of the relevant government department and organization. 15. No person shall carry out the construction of switchback, dockyard, wet dockyard, water-tight dockyard, building of jetty, pier, landing stage or vessel landing by drainage in the river-creek boundary, bank boundary and waterfront boundary without the permission of the Directorate. 22. No one shall, without the permission of the Directorate, pile sand, shingle and other heavy materials for business purposes in the bank area and waterfront area. 23. No one shall: (b) Without the permission of Directorate, build structures and bridges in river-creek boundary, bank boundary and waterfront boundary. 24. 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.
Chapter-6 Penalties	25. Whoever violates any of the prohibitions contained in sections 8, 9, 15 or section 23 may, on conviction, be punished with imprisonment for a term not exceeding 3 years or with fine not exceeding kyats 50,000 or with both. 26. Whoever violates any of the provisions contained in sections 10, 11, 12, 13 or section 14 may, on conviction, be punished with imprisonment for a term not exceeding 2 years or with fine not exceeding kyats 30,000 or with both. 27. Whoever violates any of the prohibitions contained in sections 16, 17, 18, 19, 20, 21, 22 or section 24 may, on conviction, be punished with imprisonment for a term not exceeding 1 year or with fine not exceeding kyats 10,000 or with both.
The protection of wildlife, wild plant and Conservation of Natural Area Law (1994)	
	The Director General shall, with the approval of the Minister: (a) Determine and declare endangered species of wild animal which are to be protected according to the following categories: i. Completely protected species of wild animals; ii. Normally protected species of wild animals; iii. Seasonally protected species of wild animals; (b) Determine and declare the endangered species of wild plants and

	their nature habitats thereof; (c) Lay down and carry out measures for the preservation of protected wildlife species; (d) Co-ordinate with the relevant department or organization if the wildlife which are to be determined for protection are under the administration of another Government department or government organization.
Chapter- 11 Offences and Penalties Section 35	Whoever 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 which may extend to kyats 10,000 or with both: (a) Hunting without a license; (b) Violation of any condition of the hunting license; (c) Raising without permission, for commercial purpose normally protected wild animals and seasonally protected wild animals; (d) Causing water and air pollution, causing damage to a water course or putting poison in the water in a natural area; (e) Possessing or disposing of pollutants or mineral pollutants in a natural area; (f) Establishing and operating a zoological garden or a botanical garden without a license.
Section 36	Whoever commits any of the following acts shall, on conviction be punished with imprisonment for a term which may extend to 5 years or with fine which may extend to Kyats 30,000 or with both:- (a) Killing, hunting or wounding a normally protected wild animal or seasonally protected wild animal without permission, possessing, selling, transporting or transferring such wild animal or any part thereof without permission; (b) Extracting, collecting or destroying in any manner any kind of protected wild plants within the prescribed area without permission; (c) destroying ecosystem or any natural state in the natural area; (d) Altering, removing, destroying or obliterating without permission. any boundary mark of a natural area or any boundary mark of a zoological garden or botanical garden administered by the Government or in which the Government has subscribed share capital.
Section 37	Whoever commits any of the following acts shall, on conviction be punished with imprisonment for a term which may extend to 7 years or with fine which may extend to Kyats 50,000 or with both:- (a) Killing, hunting or wounding a completely protected wild animal without permission, possessing, selling, transporting or transferring such wild animal or any part thereof without permission;

	(b) Exporting without the recommendation of the Director General a completely protected wild animal or a protected wild plant or any part thereof.
Section 38	The provisions of section 36 sub-section (a) or section 37 subsection shall not apply to: (a) The possessing as a souvenir or wearing as a traditional custom of any part of normally protected wild animal or a seasonally protected wild animal; (b) The possessing or wearing with a certificate of registration issued under section 27 subsection (b) of any pad of a completely protected wild animal; (c) The possessing, use, sale, transport or transfer of a drug prepared from a part of a protected wild animal.
Myanmar Electricity Law (2014)	
Chapter-2 Objectives	3. The objectives of this law are as follows: (a) Systematically manage electricity-related work in the country in order to better satisfy the country's need for electric power; (c) To further encourage mid- and small-scale generation and distribution of electric power in the regions and the states to supplement large-scale power generation and distribution which is to be managed by the Union; (d) To enable the wider use of electric power in a safe way in the urban and rural areas in the whole country; e) To ensure that electricity-related work in the country is performed in accordance with the stipulated standards and norms; (e) To prevent in advance the occurrence of electrical hazards and to implement effective penalties and specific rules in order to prevent losses to the public and the state when electricity-related work is performed; (j) To increase foreign and local investments in electricity-related work; (k) To write and promulgate equitable, transparent and reasonable rules and regulations for fixing electric power rates which are economically viable and sufficient to cover the investment costs; (l) To respect, and comply with, the international conventions on environmental conservation which were approved and signed by the Union.
Chapter-12 Prohibitions	44. No one shall be engaged in electricity-related work without having obtained a license from the relevant government department or organization. 45. No license holder shall engage in any work except the work contained in the license.

	46. No one shall perform electrical installations and repairs without having an electrical aptitude certificate. 47. No one shall engage in electrical power generation, transmission, connection or use without having an electrical safety certificate. 48. No one shall engage in the import, domestic production, export, distribution or sale of electrical appliances which do not conform to the norms stipulated by the relevant ministry. 49. No holder of a license to engage in electricity-related work shall perform the work jointly with, or transfer it to, someone else without the permission of the relevant department or organization. 50. No holder of a license to engage in electricity-related work shall sell, mortgage, lease, exchange, or use any other method to transfer the license or the whole work for which the license was granted or any part thereof without the permission of the relevant government department or organization which issued the license. 51. No one shall construct anything, grow trees, or engage in other inopportune activities within the electrical power line area. 52. No one shall, without the permission of the holder of the license to engage in electricity related work, obtain electric power through a connection to the line, or waste or use electric power. 53. No one shall divert electric power, cut off a power line or destroy any electrical apparatus used an electricity-related work.
Chapter-13 Offences and penalties	54. Anyone convicted of having violated the prohibition under section 44 shall be punished with a fine from minimum kyats 100,000 to maximum kyats 500,000. If, after having been punished in this way, he is convicted of having continued to commit the offence, he shall additionally be punished with imprisonment from minimum 1 year to maximum 3 years. 55. Any holder of a license to engage in electricity-related work convicted of having violated the prohibition under section 45 shall be punished with a fine from minimum kyats 100,000 to maximum kyats 500,000. If, after having been punished in this way, he is convicted of having continued to commit the offence, he shall additionally be punished with imprisonment from minimum 1 year to maximum 3 years. 56. Anyone convicted of having violated the prohibition under section 46 shall be punished with a fine from minimum kyats 50,000 to maximum kyats 300,000. 57. Anyone convicted of having violated the prohibitions under section 38 shall be punished with a fine from minimum kyats 300,000 to maximum kyats 1,000,000. 58. Anyone convicted of having violated the prohibitions under section

	47 shall be punished with imprisonment of minimum 1 year to maximum 3 years and with a fine of minimum kyats 3,000,000. The property relating to the offence shall be confiscated as state property and destroyed. 59. Any holder of a license to engage in electricity-related work convicted of having violated the prohibitions under section 48 shall be punished with a fine of minimum kyats 100,000 to maximum kyats 500,000. If, after having been punished in this way, he is convicted of having continued to commit the offence, he shall additionally be punished with imprisonment from minimum 1 year to maximum 3 years. 60. Any holder of a license to engage in electricity-related work convicted of having violated the prohibitions under section 49 shall be punished with a fine of minimum kyats 100,000 to maximum kyats 500,000. 61. Anyone convicted of having violated any prohibitions under section 50 shall be punished with imprisonment of up to 3 years and with a fine of up to kyats 1,000,000. 62. Anyone convicted of having violated any prohibitions under section 51 shall be punished with imprisonment of up to 3 years and with a fine of up to kyats 1,000,000. 63. Anyone convicted of having violated the prohibitions under section 52 shall be punished with imprisonment of minimum 5 years to maximum 10 years and with a fine of minimum kyats 100,000 to maximum kyats 1,000,000. 64. Anyone convicted of having abetted or aided to violate any prohibitions under sections 44 to 53 shall be punished as if he had committed the offence.
The Myanmar Fire Force Law (2015)	
Objective:	To ensure to prevent the fire, to provide the precautionary material and apparatuses, if the fire caused in the project area to be defeated because the project is business in which electricity and any inflammable materials such as petroleum are used. So, the project owner has to institute the specific fire service in line with the above law. This law focuses the following • The project proponent has to institute the specific fire services, under sub-section (a) of section 25 of said law. • The project owner has to provide materials and apparatuses for fire

	precaution and prevention, under sub-section (b) of section 25of said law.
Prevention of Hazardous from Chemical and Related Substances Law (2013)	
Objectives:	To ensure to use the hazardous chemical and related substances safely and safety for the employees. Moreover safety in carrying the hazardous chemical and related substances and storage place of it. If it is needed to train how to use the safety dresses which provided to the employees with free of charges. Insure to compensate for injury to person or damage to environment. The project has to be inspected for safety use of hazardous chemical and related substances before starting the project. This law focuses as follows; • The project owner will be inspected for the safety and resistance of the machinery and equipments by the respective Supervisory Board and Board of Inspection before starting the business, under sub-section(a) of section 15 of said law • The project owner will assign the employees, who will serve with the hazardous chemical and substances, to attend the trainings on prevention of hazardous chemical and substances in local or abroad, under sub-section(b) of section 15 of said law • The project owner will abide by the conditions included in the licence, under sub-section(a) of section 16 • The project owner will abide by and assign to the employees who serve in this work to abide by the instructions for safety in using the hazardous chemical and related substances, under sub-section(b)of section 16 • The project owner will arrange the enough safety equipments in the work-place and provide the safety dresses to the employees who serve in this work with free of charge, under sub-section(c)of section 16 • The project owner will train, in work-place my arrangement ,the know-how to use the occupational safety equipment, personal protection equipment and safety dresses systemically in the work-place, under sub-Section(d) of section 16 • The project owner will allow the receptive Supervisory Board and Board of Inspection to inspect whether the hazard may be injured to health of human or animal or damaged to environment, under sub-section(e) of section 16 • The project owner will assign the healthy employees who have

	obtained the recommendation that is fit for this work after taken medical check- up and keep systematically the medical records of employees, under sub-section (f) of section 16. • The project owner will inform the copy of storage permission for hazardous chemical and related substances to the relevant township administrative office, under sub-section (g) of section 16. • The project owner will obtain the approval with instructions of relevant fire force before starting the work if the project will use the fire hazard substances or explosive substances, under sub-section (h) of section 16. • The project owner will transport only the limited amount of the chemical and related substance in accord with the prescribed stipulations in local transportation under sub-section (i) of section 16. • The project owner will insure, in accord with the stipulations, to pay the compensation if the project cause injury to person or animals or damage to environment, under section 17. • The project owner will abide by the conditions included in the registration certificate. Moreover will abide by the orders and directives issued by the Central Supervisory Board from time to time, under section 22. • The project owner will classify the level of hazard to protect it in advance according to the properties of chemical and related substances, under sub-section (a) of section 27. • The project owner will provide the safety equipments, personal protection equipments to protect and reduce the accident and assign to attend the training to use the equipments systematically

4.2 Application of International Guidelines

Specifically, the initial environmental examination for this project will follow not only the national regulations such as the environmental conservation law, environmental conservation rules and relevant regulations of the government of the republic of the union of Myanmar but also international guidelines such as WHO standards, IFC environmental health and safety guidelines for environmental and social considerations.

4.2.1 IFC Guidelines for Electric Power Transmission and Distribution (2007)

The EHS guidelines for electric power transmission and distribution include information relevant to power transmission between a generation facility and a substation located

within an electricity grid, in addition to power distribution from a substation to consumers located in residential, commercial, and industrial areas.

4.2.2 IFC Environmental, Health and Safety (EHS) Guidelines (2007)

The World Bank group environmental, health and safety guidelines (EHS guidelines) are technical reference documents with general and industry-specific examples of good international industry practice (GIIP). The EHS guidelines contain the performance levels and measures that are normally acceptable to IFC and that are generally considered to be achievable in new facilities at reasonable costs by existing technology. The general EHS guideline contains information on crosscutting environmental, health, and safety issues potentially applicable to all industry sectors. It should be used together with the relevant industry sector guideline(s). When host country (Myanmar) regulations differ from the levels and measures presented in the EHS guidelines, projects are expected to achieve whichever is more stringent.

4.2.3 IFC Guidelines on Waste Management Facilities (2007)

The EHS guidelines for waste management cover facilities or projects dedicated to the management of municipal solid waste and industrial waste, including waste collection and transport; waste receipt, unloading, processing, and storage; landfill disposal; physio-chemical and biological treatment; and incineration projects. Industry-specific waste management activities applicable, for example, to medical waste, municipal sewage, cement kilns, and others are covered in the relevant industry-sector EHS guidelines, as is the minimization and reuse of waste at the source.

AUNG MYINT MO CO., LTD.

No. 212, East Circular Road, Min Ga Lar Oo Quarter, Taunggyi, Myanmar .
Phone: 95-081-2123852, Fax: 95-081-2123852 . Email: zawzawoo.amm@gmail.com

Our Reference: AMM/337-270917/MT

Date:27.09.2017

Subject: **To follow Commitments and Mitigation Measures stated in the Environmental Management Plan of Initial Environmental Examination Report (IEE)**

With regard to the above matter, we, Aung Myint Mo Co., Ltd. strongly commits that IEE report for our project is strong and complete, we obeyed Rules and Regulations including EIA procedure in preparing IEE report and we will follow our commitments, mitigation measures and EMP which are mentioned in the IEE report for our proposed project.

Yours Respectfully,

AUNG MYINT MO CO., LTD. No..... Date.....

Zaw Zaw Oo
Managing Director
Aung Myint Mo Co.,Ltd.

CHAPTER V: PHYSICAL ENVIRONMENTAL CONDITION

5.1 Description of the Surrounding Environment

5.1.1 Existing Condition of KENG TENG

(a) Topography

The proposed project of 230 kV power transmission line (phase 2) is started at Tarkaw Bridge, and across the Mong Pyin Township, Tong Tar Township and ended in Keng Teng Township. Keng Teng Township is located where surrounding the hills in height of above 5000-7000 ft. The valley foothills are about 7210 ft above the sea level. Topographical condition is slopping from North to South. Keng Teng township is surrounded by the highly mountains. Valley sites are famous for good fertilizer field.

(b) Climate

Keng Teng Township is highland subtropical and the highest temperature is (36.5ºC) and the lowest temperature is (7.0ºC). Monthly rainfall and temperature data in 2011 to 2015 are the following.

No	Year	Rainfall		Temperature	
		Raining days	Total rainfall(inches)	Summer(ºC)	Winter(ºC)
				Highest	Lowest
1.	2011	115	54.69”	28.8	18.0
2.	2012	80	46.02”	30.3	18.0
3.	2013	107	64.80”	29.4	17.8
4.	2014	91	48.03”	30.1	17.4
5.	2015	98	49.97”	33.9	10.8

5.1.2 Mong Pyin

(a) Topography

Mong Pyin Township is located in the Eastern part of Shan State, Keng Teng District. It is also located North Latitude between (18º) and (29º) and East Longitude between (92º) and (101º). The area and boundary of township are the followings. The area of Mong Pyin Township is 0.73 sq area miles and there are two town in this township, Mine pyin town and Tong Tar town. Mong Pyin Township has been bordering in the Eastern Keng Teng Township, Western Kon Hein Township, Southern Mine Hsat Township and Northern Mat Mann Township. Mong Pyin Township is commonly hilly.

(b) Hydrological Condition

Mong Pyin Township is located above the sea level of 1518 feet. Lwal See hill in height of (7329ft) is the highest in this township. Than Lwin River in Mong Pyin is running from West-North to West, Nant Syin stream is running from East to South, Nant Ka stream is running from East to West and Nant Pain stream is running from South to North.

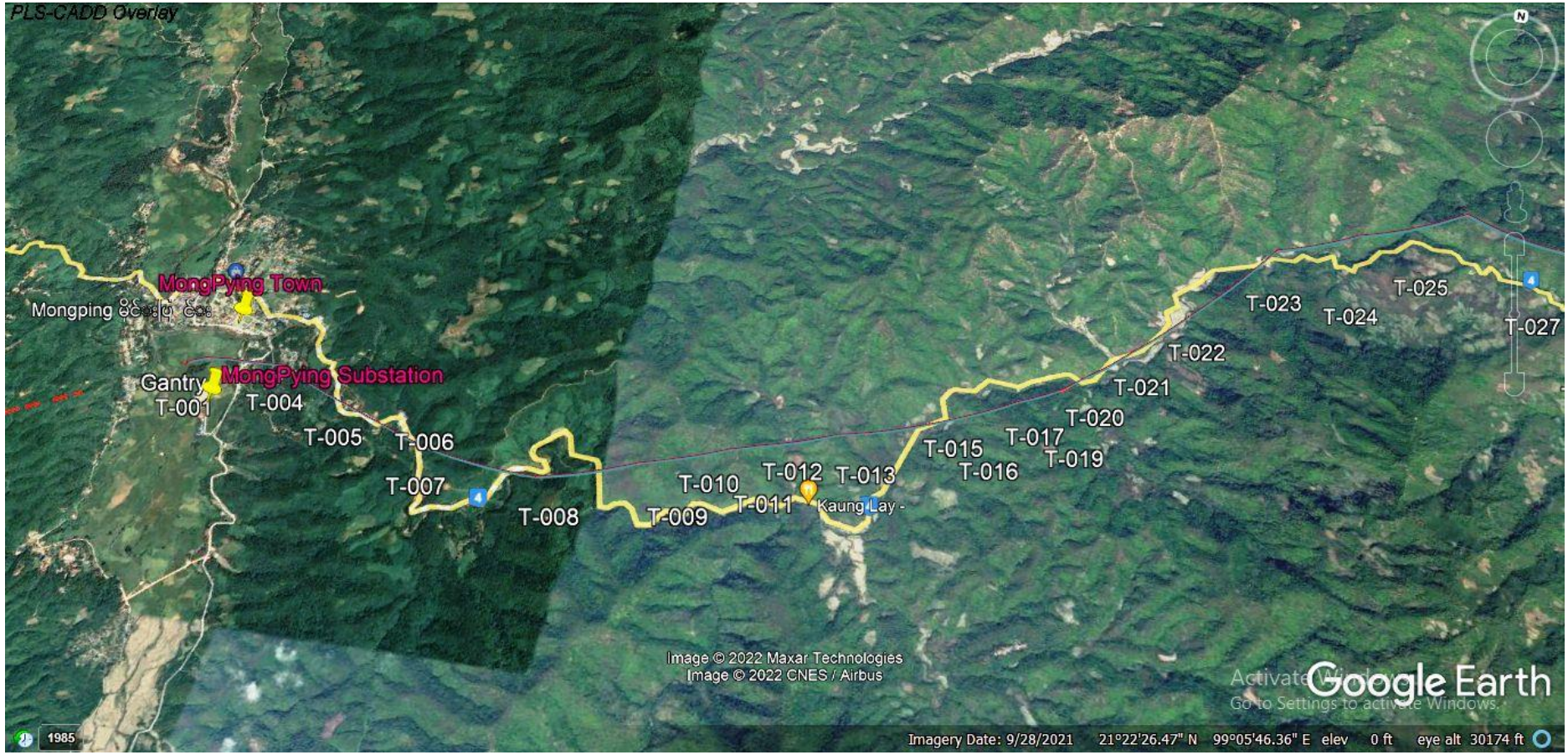
(c) Ecological Resources

The natural vegetation that are growing in Mong Pyin are Teak, Padauk, Ingyin, Thityar, Thital, pine, Latpan, Mike kaw, Swal Daw,bushes, bines and various of bamboos. The wild animals founded in Mong Pyin Township are tigers, leopards, bears, bisons, deers, barking deers, wart-hogs, goat-antelopes, tiger-cat (raccons), moles, pangolins, monkeys, snakes, bats, quails, various squirrels' birds. The existing environmental conditions of Mong Pyin is (59.31%) of forest cover. Among this reserved forest cover is (38.04 %), protected public forest cover is (21.27%).

(d) Climate

Mong Pyin Township is the hot, humid climates and the highest temperature is 33ºC and the lowest temperature is 10ºC. The followings are the annual rainfall and temperature.

No	Year	Rainfall		Temperature	
		Raining days	Total rainfall (inches)	Summer(ºC) highest	Winter(ºC) lowest
1	2011	32	40.37	30	10
2	2012	81	47.86	31	11
3	2013	89	48.39	32	11
4	2014	83	37.75	33	11
5	2015	81	38.51	34	11
6	2016	13	3.67	34	11



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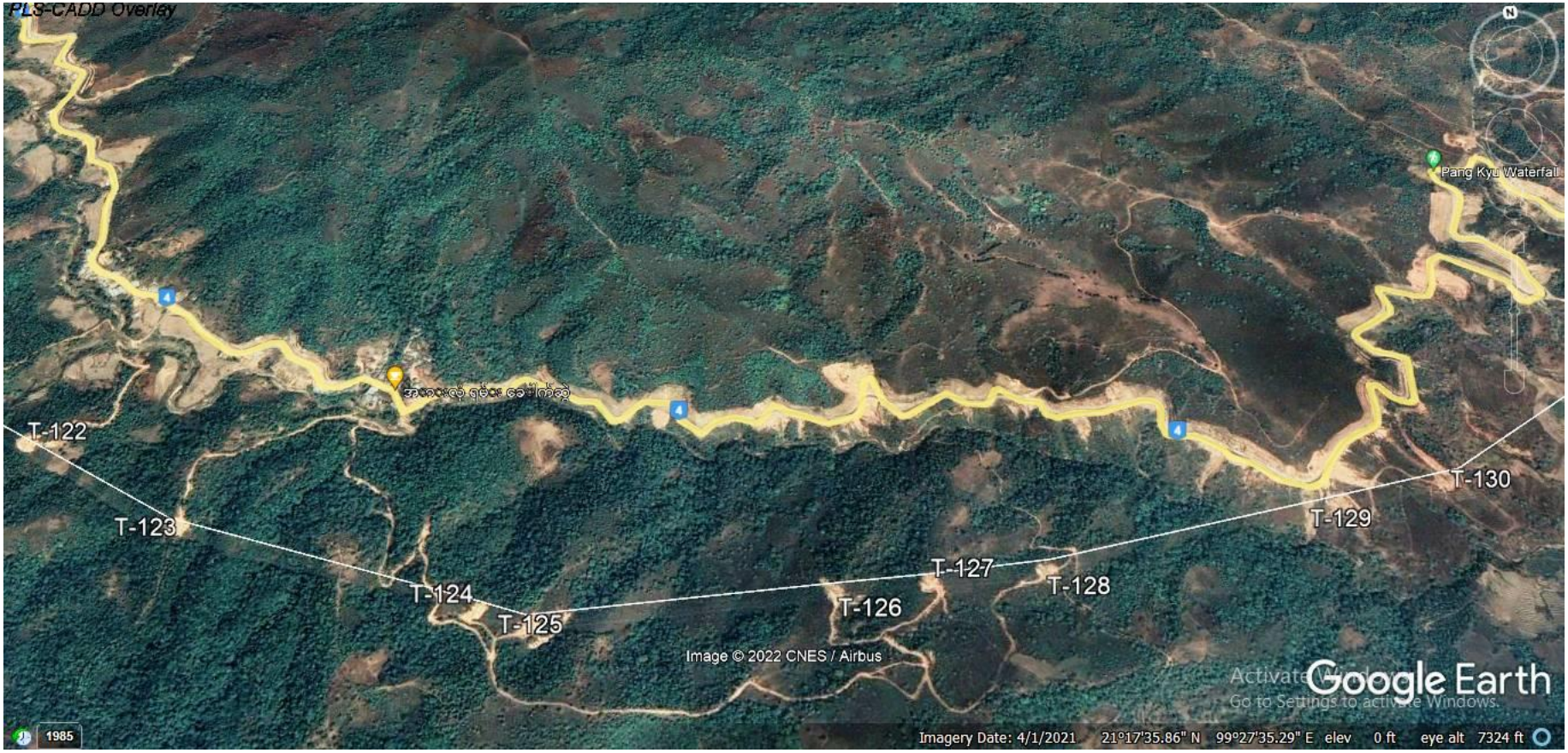

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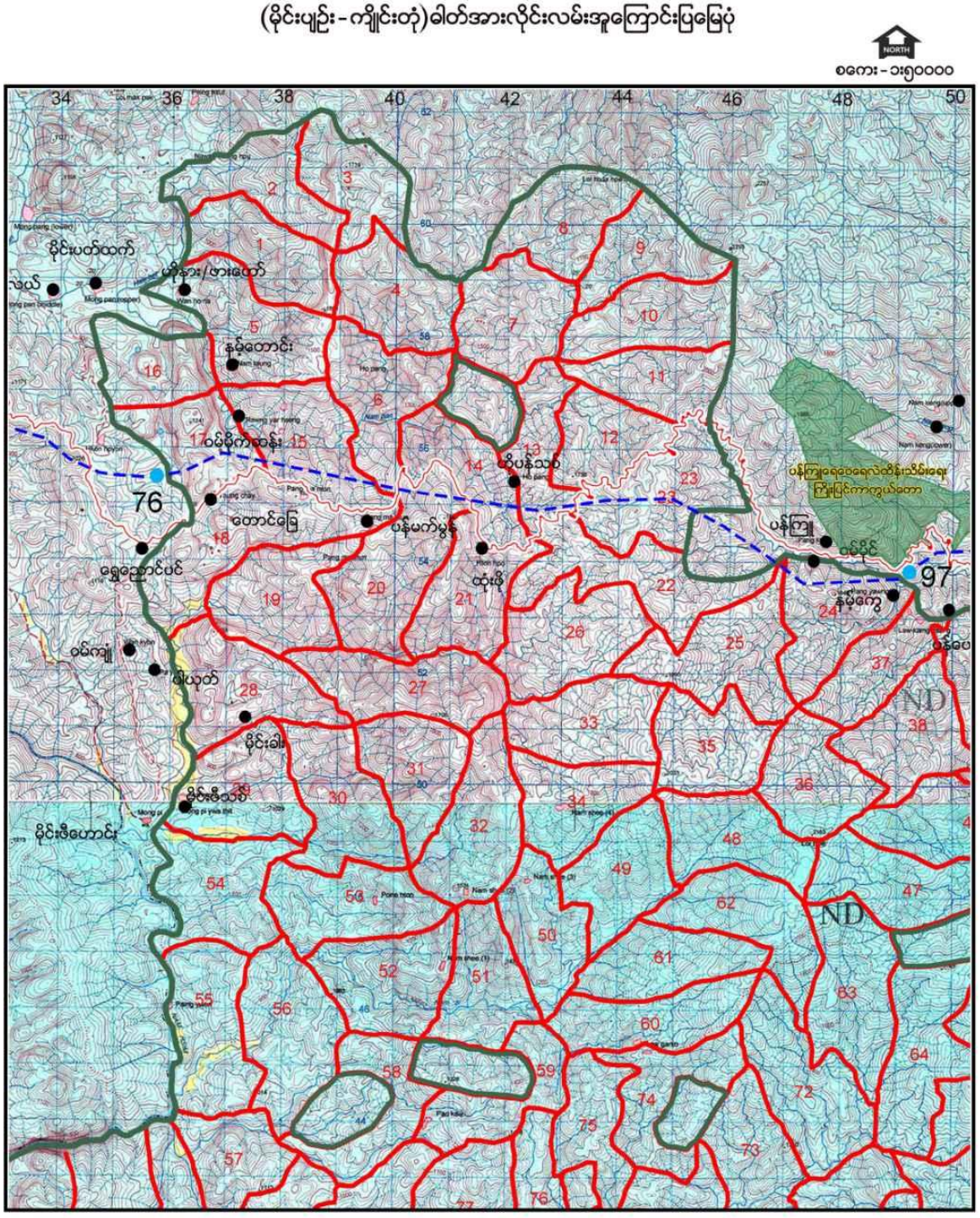

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ခါတ်အားလိုင်းလမ်းအူကြောင်း -

မြေပုံချပ်အမှတ် - 2199-07

နောင်ချိုကြီးပြင်ကာကွယ်တောအတွင်းဖြတ်သန်းသွားသော ၂၃၀ - ကေဗွီ
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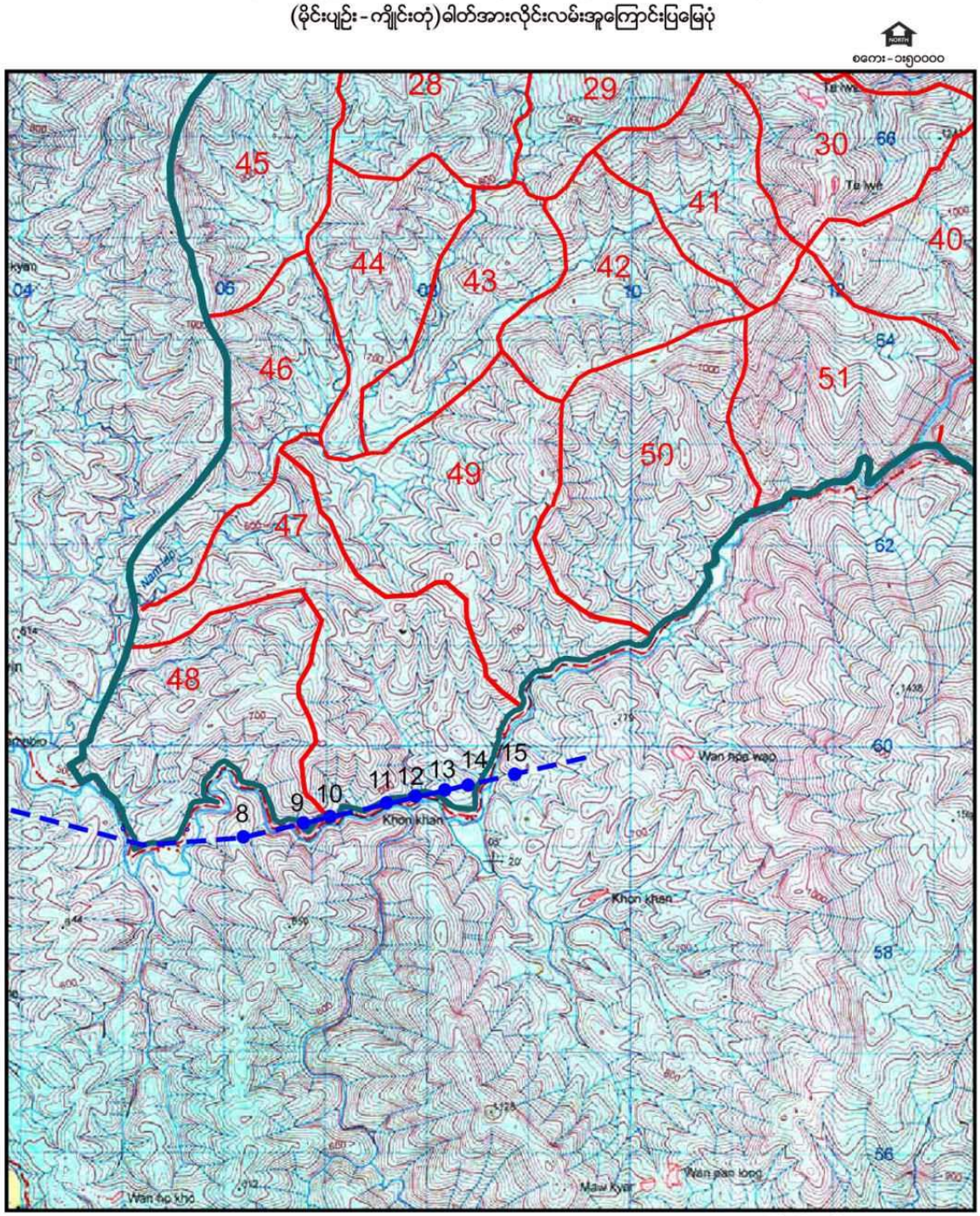

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ဓါတ်အားလိုင်းလမ်းအုပ်ကြောင်း

Distance from the Transmission Tower

Village	Distance from the Tower (mile)
Pann Kyuu	**0.26**
Winbo	**0.22**
Nanaww	**0.23**
Pan Oo	**0.24**
Shwenaungpin	**0.27**
Hopan	**0.35**
Manglan	**0.18**
Kho Nar Kyaung	**0.24**
Sin Maung	**0.11**

5.2 Environmental Quality Analysis

5.2.1 Air Quality

The followings are the methodologies used for this IEE report preparations;

i) **Onsite Measurements and Analysis** – Baseline environmental parameters such as air quality, noise and water quality of the project site before the operation phase are measured and results are mentioned in this Chapter. The environmental quality of air, water, noise and vibration were measured as baseline survery and EQ measurement for the construction phase will be measured during the monitoring stage after getting the approval of this IEE report.

ii) **Secondary Data Collection and Analysis** – Some data such as socioeconomic condition, physical/biological environment and weather data are collected from official township data from General Administrative Department and analyzed by the study team.

Table 5. 1: Equipment Used for Onsite Measurement

No.	Name and Model of Instrument	Purpose	Measuring Instrument
1.	Haz-Scanner EPAS	PM_{10}, $PM_{2.5}$, NO_2, CO, CO_2, Temperature, and Relative Humidity	
2.	Digital Sound Level Meter	Noise	
3.	Multi 3430 Digital Meter for Digital IDS Sensor	Temperature, pH, DO, EC, TDS and Salinity	

In the project site, air quality was tested with EPAS (HAZ-SCANNER) Environmental Perimeter Air Station. This instrument can be used to measure ambient air quality and to measure and document critical U.S EPA criteria pollutants, including nitrogen dioxide, ozone, carbon dioxide, particulates, VOCs etc. EPAS provides direct readings in real time with data-logging capabilities. At the initial stage of the project, baseline air quality should be measured in the vicinity of the site to assess background levels of key pollutants and to differentiate between existing ambient conditions and project-related impacts in future. Air quality is composed of dust and gas emissions of the ambient air.

Dust Level: For IEE for this project, E guard Environmental Services Co., Ltd measured the air quality near the proposed project site in (3) Points with the EPAS (HAZ- SCANNER) for 24 hours. The objective of this air quality measurement is to show the ambient air quality of the project site. At the initial stage of the project, baseline air quality should be measured in the

vicinity of the site to assess background levels of key pollutants and to differentiate between existing ambient conditions and project-related impacts in future. We should consider not only the ambient air quality but also the gas emission, humidity, temperature and dust level. The observed value is compared with the guideline of the National Environmental Quality (Emissions) Guidelines (NEQ), ACGIH (TLV), WHO Guidelines, IFC Guideline. It is not dangerous for local people and workers if the observed value is lesser than the guideline value. But, if the observed value is greater than the guideline value, it is harmful for local people and workers. Some effects of particulate matter are very evident to the general affected general public. Problems of reduced visibility, eye irritation, and soiling of clothes are readily noticeable.Air quality is measured on the proposed project site of Pan kyuu village, Keng Teng township which is situated at latitude **21°16'18.13"N and longitude 99°32'52.93"E and elevation is 3284 ft.**

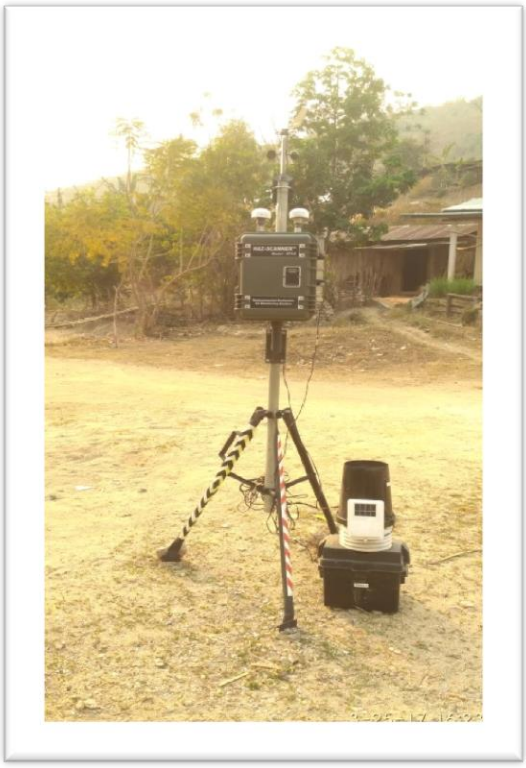


Figure 5. 1: Air Quality Measurement at Pan Kyuu village for 24 hrs (continuously)

Table 5. 2: Result Value of PM_{10} and $PM_{2.5}$ in Pan Kyuu village (24 Hours)

No.	Times	Average (µg/m3)		Maximum (µg/m3)		Minimum (µg/m3)	
		PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
1.	12:30:00	66	25	112	29	11	2
2.	13:30:00	69	16	120	20	9	2
3.	14:30:00	67	18	124	49	10	3
4.	15:30:00	65	21	113	35	8	3
5.	16:30:00	64	19	134	26	9	2
6.	17:30:00	60	18	133	21	10	2
7.	18:30:00	61	17	110	26	9	2
8.	19:30:00	59	16	112	19	8	2
9.	20:30:00	62	15	99	21	6	1
10.	21:30:00	55	15	95	21	9	1
11.	22:30:00	51	15	98	19	6	1
12.	23:30:00	53	12	93	6	5	1
13.	00:30:00	50	12	86	5	3	1
14.	01:30:00	50	6	83	10	6	1
15.	02:30:00	42	10	84	12	9	1
16.	03:30:00	41	9	80	5	11	1
17.	04:30:00	41	13	80	10	4	1
18.	05:30:00	42	15	75	20	4	2
19.	06:30:00	42	11	74	15	3	2
20.	07:30:00	45	12	70	26	4	1
21.	08:30:00	43	10	86	31	4	2
22.	09:30:00	48	14	85	41	5	2
23.	10:30:00	47	16	85	26	8	2
24.	11:30:00	56	16	87	26	11	2
24-hour average		**53.29**	**14.63**	**96.58**	**21.6**	**7.17**	**1.67**

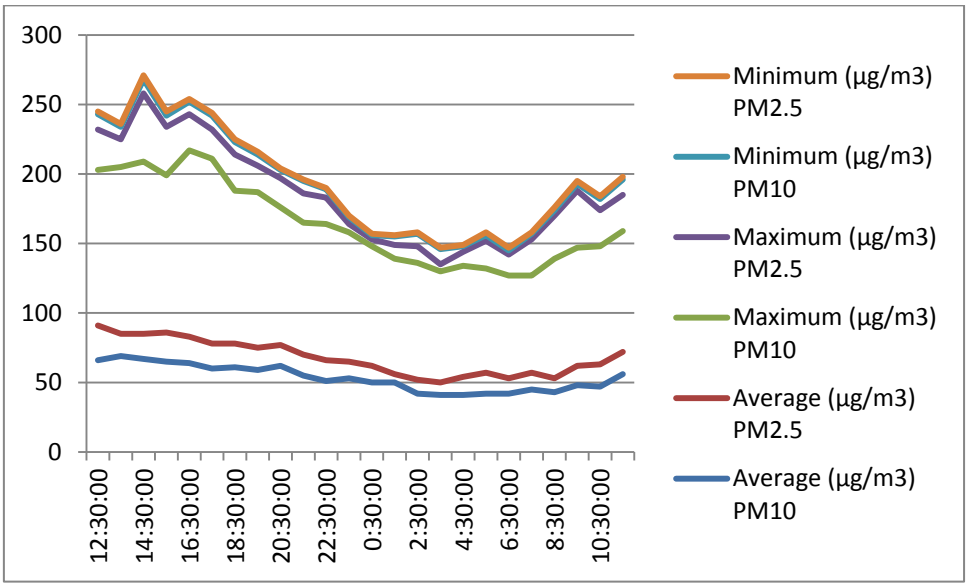


Table 5. 3: The result of Particulate Matter (PM_{10} and $PM_{2.5}$) compared with NEQ Guideline (24 hrs. continuous) at Pan kyuu village

Date	Time	Substance ($\mu g/m^3$)	Result ($\mu g/m^3$)	NEQ (Emission) Guidelines ($\mu g/m^3$)
25/26.March.2017	Start Time:12:30 End Time:12:45	PM_{10} $\mu g/m^3$	53	50
		$PM_{2.5}$ $\mu g/m^3$	15	25
Remark	✓			

Gaseous Emission: Concentration of Carbon monoxide (CO), Carbon dioxide (CO2), Sulphur dioxide (SO2), Nitrogen dioxide (NO2) were investigated near the project sites which was recorded as the baseline data. The observed values are compared with National Environmental Quality (Emissions) Guideline values, ACGIH Guideline Values and WHO Guideline Values are as shown below.

Table 5. 4: Comparison of the Observed Value and Guideline Value near the project site (Pan Kyuu village)

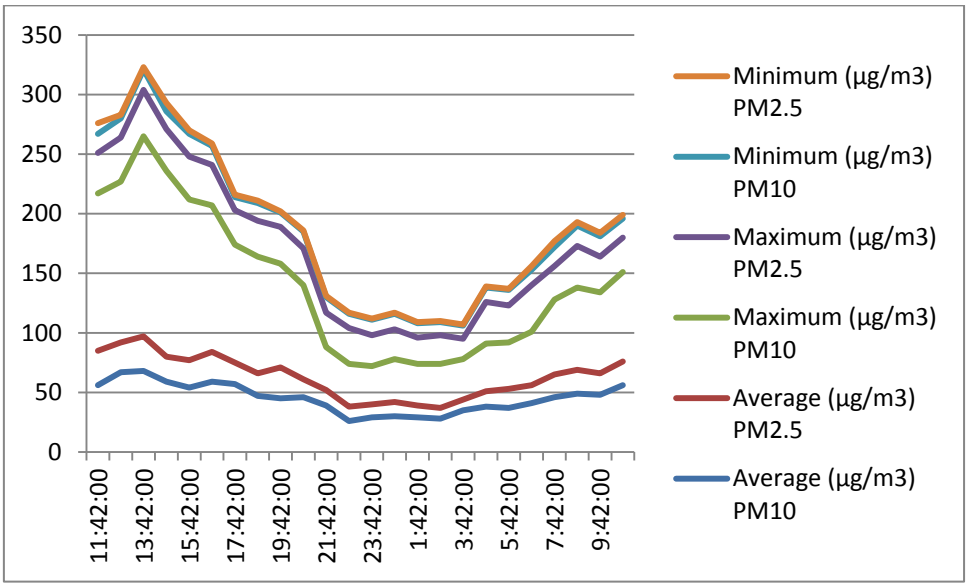
No.	Parameter	Averaging Period	Observed Value	Standards/ Guidelines	Organization
1.	CO	8 hrs	453 (µg/m^3)	601.331(µg/ m^3)	WHO Guideline
2.	CO_2	24 hrs	260 (ppm)	5000 (ppm)	ACGIH
3.	SO_2	24 hrs	20 (µg/m^3)	20 (µg/m^3)	NEQ (Emission) Guidelines
4.	NO_2	1 hr	0.14 (µg/m^3)	200 (µg/m^3)	NEQ (Emission) Guidelines

The Second time Air quality is measured on the proposed project site of Kho Nar Kyaung village, Mong Pyin township which is situated at latitude 21°20'23.89"N and longitude 99°09'08.84"E and elevation is 2883 ft.

Figure 5. 2: Air Quality Measurement at Kho Nar Kyaung village for 24 hrs (continuously)

Table 5. 5: Result Value of PM_{10} and $PM_{2.5}$ in Kho Nar Kyaung village (24 Hours)

No.	Times	Average (µg/m3)		Maximum (µg/m3)		Minimum (µg/m3)	
		PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
1.	11:42:00	56	29	132	34	16	9
2.	12:42:00	67	25	135	37	16	3
3.	13:42:00	68	29	168	39	17	2
4.	14:42:00	59	21	156	35	15	7
5.	15:42:00	54	23	135	36	19	3
6.	16:42:00	59	25	123	34	16	2
7.	17:42:00	57	18	99	29	11	2
8.	18:42:00	47	19	98	30	15	2
9.	19:42:00	45	26	87	31	12	1
10.	20:42:00	46	15	79	31	14	1
11.	21:42:00	39	13	36	29	13	1
12.	22:42:00	26	12	36	30	12	1
13.	23:42:00	29	11	32	26	13	1
14.	0:42:00	30	12	36	25	13	1
15.	1:42:00	29	10	35	22	12	1
16.	2:42:00	28	9	37	24	11	1
17.	3:42:00	35	9	34	17	11	1
18.	4:42:00	38	13	40	35	12	1
19.	5:42:00	37	16	39	31	13	1
20.	6:42:00	41	15	45	39	13	3
21.	7:42:00	46	19	63	28	16	5
22.	8:42:00	49	20	69	35	17	3
23.	9:42:00	48	18	68	30	17	3
24.	10:42:00	56	20	75	29	16	3
24-hour average		**45**	**17.8**	**77.38**	**31**	**14.2**	**2.42**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Minimum (µg/m3) PM10
Maximum (µg/m3) PM2.5
Maximum (µg/m3) PM10
Average (µg/m3) PM2.5
Average (µg/m3) PM10

Table 5. 6: The result of Particulate Matter (PM_{10} and $PM_{2.5}$) compared with NEQE Guideline (24 hrs. continuous) at Kho Nar Kyaung village

Date	Time	Substance (µg/m^3)	Result (µg/m^3)	NEQ (Emission) Guidelines (µg/m^3)
29/30.March.2017	Start Time: 11:42 End Time: 12:11	PM_{10} µg/m^3	45	50
		$PM_{2.5}$ µg/m^3	18	25

Gaseous Emission: Concentration of Carbon monoxide (CO), Carbon dioxide (CO2), Sulphur dioxide (SO2), Nitrogen dioxide (NO2) were investigated near the project sites which was recorded as the baseline data. The observed values are compared with National Environmental Quality (Emissions) Guideline values, ACGIH Guideline Values and WHO Guideline Values are as shown below.

Table 5. 7: Comparison of the Observed Value and Guideline Value near the project site (Kho Nar Kyaung village)

No.	Parameter	Averaging Period	Observed Value	Standards / Guidelines	Organization
1.	CO	8 hrs	546 (µg/m^3)	601.331 (µg/m^3)	WHO Guideline
2.	CO_2	24 hrs	267 (ppm)	5000 (ppm)	ACGIH
3.	SO_2	24 hrs	20 (µg/m^3)	20 (µg/m^3)	ECD (Myanmar)
4.	NO_2	1 hr	0.13 (µg/m^3)	200 (µg/m^3)	ECD (Myanmar)

Air quality is measured on the proposed project site of Sin Maung village, Mine Pyin township which is situated at latitude 21°17'33.75"N and longitude 98°49'42.21"E and elevation is 2093 ft.

Figure 5. 3: Air Quality Measurement at Sin Maung village for 24 hrs (continuously)

Table 5. 8: Result Value of PM_{10} and $PM_{2.5}$ in Sin Maung village (24 Hours)

No.	Times	Average (µg/m3)		Maximum (µg/m3)		Minimum (µg/m3)	
		PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
1.	12:34	63	1	143	1	58	2
2.	13:34	69	1	138	1	93	2
3.	14:34	71	1	129	1	105	2
4.	15:34	67	1	140	1	112	2
5.	16:34	59	1	139	1	85	1
6.	17:34	57	1	136	1	169	1
7.	18:34	59	1	112	1	160	1
8.	19:34	49	1	123	1	141	1
9.	20:34	60	1	109	1	155	1
10.	21:34	48	162	110	193	163	1
11.	22:34	41	153	99	188	169	1
12.	23:34	37	166	86	193	172	1
13.	0:34	30	175	73	207	184	1
14.	1:34	31	154	80	202	155	1
15.	2:34	35	170	87	261	176	1
16.	3:34	33	186	80	257	178	1
17.	4:34	30	208	74	252	197	1

No.	Times	Average (µg/m3)		Maximum (µg/m3)		Minimum (µg/m3)	
		PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
18.	5:34	35	192	60	218	187	1
19.	6:34	39	208	63	225	214	183
20.	7:34	36	200	58	224	203	178
21.	8:34	41	182	78	206	164	157
22.	9:34	48	140	97	183	120	111
23.	10:34	51	146	89	171	134	109
24.	11:34	58	121	116	155	131	103
24-hour average		**48**	**107**	**101**	**131**	**151**	**91**

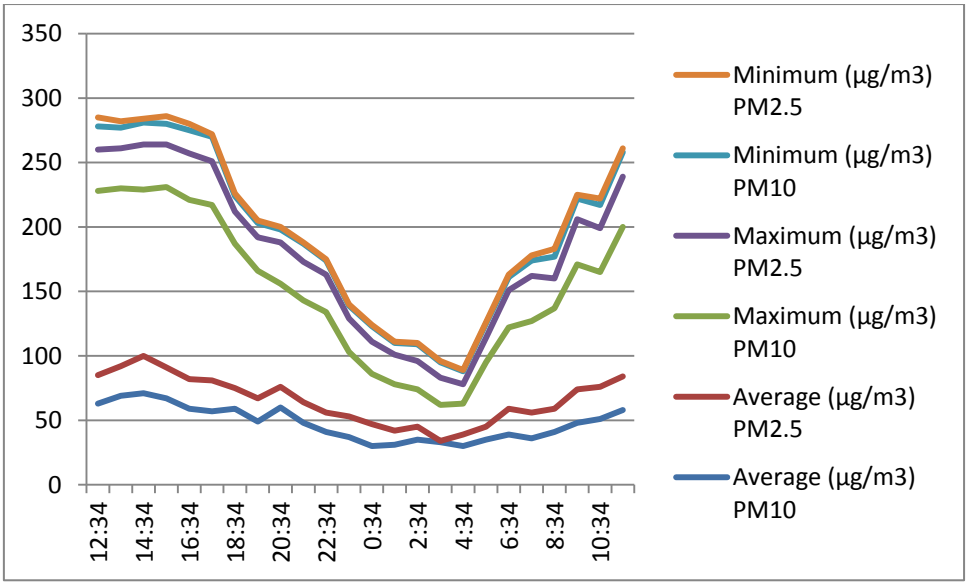


Table 5. 9: The result of Particulate Matter (PM_{10} and $PM_{2.5}$) compared with NEQ Guideline (24 hrs. continuous) at Sin Maung village

Date	Time	Substance ($\mu g/m^3$)	Result ($\mu g/m^3$)	NEQ (Emission) Guidelines ($\mu g/m^3$)
31/1.Mar/Apr.2017	Start Time:12:34 End Time: 12:34	PM_{10} $\mu g/m^3$	185	50
		$PM_{2.5}$ $\mu g/m^3$	107	25

Gaseous Emission: Concentration of Carbon monoxide (CO), Carbon dioxide (CO2), Sulphur dioxide (SO2), Nitrogen dioxide (NO2) were investigated near the project sites which was recorded as the baseline data. The observed values are compared with National

Environmental Quality (Emissions) Guideline values, ACGIH Guideline Values and WHO Guideline Values are as shown below.

Table 5. 10: Comparison of the Observed Value and Guideline Value near the project site (Sin Maung village)

No.	Parameter	Averaging Period	Observed Value	Standards/ Guidelines	Organization
1.	CO	8 hrs	1634 (µg/m^3)	601.331(µg/ m^3)	WHO Guideline
2.	CO_2	24 hrs	292 (ppm)	5000 (ppm)	ACGIH
3.	SO_2	24 hrs	67 (µg/m^3)	20 (µg/m^3)	ECD (Myanmar)
4.	NO_2	1 hr	0.06 (µg/m^3)	200 (µg/m^3)	ECD (Myanmar)

5.2.2 Noise Quality

Noise level is measured by Digital Sound Level Meter at the project site for source 3 points. The first point for noise level measurement is conducted at source (21°16'18.13"N and longitude 99°32'52.93"E) from 25th March, 2017 to 26th March, 2017 for 24 hours continuously. The observed values are the followings.

Figure 5. 4: Noise quality Measurement at Pan Kyuu village for 24 hrs (continuously)

Table 5. 11: Observed Value of Noise Level Measurement near the Proposed Project Site (Pan Kyu village)

Figure 5. 5: Noise quality Measurement at Kho Nar Kyaung village for 24 hrs (continuously)

Table 5. 12: Observed Value of Noise Level Measurement near the Proposed Project

No.	Date	Time	Mean Value(dB)	Weight	Day/night
1	25/3/2017	11:51:19-12:50:19	51	A	Day
2	25/3/2017	12:51:19-13:50:19	49	A	Day
3	25/3/2017	13:51:19-14:50:19	53	A	Day
4	25/3/2017	14:51:19-15:50:19	51	A	Day
5	25/3/2017	15:51:19-16:50:19	50	A	Day
6	25/3/2017	16:51:19-17:50:19	49	A	Day
7	25/3/2017	17:51:19-18:50:19	47	A	Day
8	25/3/2017	18:51:19-19:50:19	47	A	Day
9	25/3/2017	19:51:19-20:50:19	43	A	Day
10	25/3/2017	20:51:19-21:50:19	40	A	Day
11	25/3/2017	21:51:19-22:50:19	36	A	Day
12	25/3/2017	22:51:19-23:50:19	35	A	Night
13	25/3/2017	23:51:19-0:50:19	36	A	Night
14	26/3/2017	0:51:19-1:50;19	37	A	Night
15	26/3/2017	1:51:19-2:50:19	36	A	Night
16	26/3/2017	2:51:19-3:50:19	38	A	Night
17	26/3/2017	3:51:19-4:50:19	41	A	Night
18	26/3/2017	4:51:19-5:50:19	47	A	Night
19	26/3/2017	5:51:19-6:50:19	48	A	Night
20	26/3/2017	6:51:19-7:50:19	49	A	Day
21	26/3/2017	7:51:19-8:50:19	50	A	Day
22	26/3/2017	8:51:19-9:50:19	51	A	Day
23	26/3/2017	9:51:19-10:50:19	50	A	Day
24	26/3/2017	10:51:19-11:50:19	50	A	Day
25.	**Average for day time**		**48**	**A**	**Day**
26	**Average for night time**		**40**	**A**	**Night**

Site (Kho Nar Kyaung village)

No	Date	Time	Mean Value (dB)	Weight	Day/Night
1	29/3/2017	11:1:24-12:0:24	53	A	Day
2	29/3/2017	12: 1:24-13: 0:24	47	A	Day
3	29/3/2017	13: 1:24-14: 0:24	47	A	Day
4	29/3/2017	14: 1:24-15: 0:24	49	A	Day
5	29/3/2017	15: 1:24-16: 0:24	49	A	Day
6	29/3/2017	16: 1:24-17: 0:24	51	A	Day
7	29/3/2017	17: 1:24-18: 0:24	54	A	Day
8	29/3/2017	18: 1:24-19: 0:24	50	A	Day
9	29/3/2017	19: 1:24-20: 0:24	43	A	Day
10	29/3/2017	20:2:24-21: 0:24	39	A	Day
11	29/3/2017	21: 1:24-22: 0:24	39	A	Day
12	29/3/2017	22: 1:24-23: 0:24	39	A	Night
13	29/3/2017	23: 1:24-0: 0:24	37	A	Night
14	30/3/2017	0: 1:24-1: 0:24	38	A	Night
15	30/3/2017	1: 1:24-2: 0:24	38	A	Night
16	30/3/2017	2: 1:24-3: 0:24	37	A	Night
17	30/3/2017	3: 1:24-4: 0:24	42	A	Night
18	30/3/2017	4: 1:24-5: 0:24	49	A	Night
19	30/3/2017	5: 1:24-6: 0:24	52	A	Night
20	30/3/2017	6: 1:24-7: 0:24	50	A	Day
21	30/3/2017	7: 1:24-8: 0:24	52	A	Day
22	30/3/2017	8: 1:24-9: 0:24	55	A	Day
23	30/3/2017	9: 1:24-10: 0:24	52	A	Day
24	30/3/2017	10: 1:24-11:0:24	51	A	Day
25.	**Average for day time**		**49**	**A**	**Day**
26.	**Average for night time**		**42**	**A**	**Night**

Figure 5. 6: Noise quality Measurement at Sin Maung village for 24 hrs (continuously)

Table 5. 13: Observed Value of Noise Level Measurement near the Proposed Project Site (Sin Maung village)

No	Date	Time	Mean Value (dB)	Weight	Day/Night
1	31/3/2017	12:1:28-13:1:28	57	A	Day
2	31/3/2017	13:2:28-14:1:28	54	A	Day
3	31/3/2017	14:2:28-15:1:28	53	A	Day
4	31/3/2017	15:2:28-16:1:28	55	A	Day
5	31/3/2017	16:2:28-17:1:28	53	A	Day
6	31/3/2017	17:2:28-18:1:28	53	A	Day
7	31/3/2017	18:2:28-19:1:28	55	A	Day
8	31/3/2017	19:2:28-20:1:28	47	A	Day
9	31/3/2017	20:2:28-21:1:28	44	A	Day
10	31/3/2017	21:2:28-22:1:28	46	A	Day
11	31/3/2017	22:2:28-23:1:28	45	A	Night
12	31/3/2017	23:2:28-0:1:28	41	A	Night
13	1/4/2017	0:2:28-1:1:28	40	A	Night
14	1/4/2017	1:2:28-2:1:28	39	A	Night
15	1/4/2017	2:2:28-3:1:28	38	A	Night
16	1/4/2017	3:2:28-4:1:28	42	A	Night
17	1/4/2017	4:2:28-5:1:28	47	A	Night

No	Date	Time	Mean Value (dB)	Weight	Day/Night
18	1/4/2017	5:2:28-6:1:28	49	A	Night
19	1/4/2017	6:2:28-7:1:28	53	A	Day
20	1/4/2017	7:2:28-8:1:28	59	A	Day
21	1/4/2017	8:2:28-9:1:28	58	A	Day
22	1/4/2017	9:2:28-10:1:28	57	A	Day
23	1/4/2017	10:2:28-11:1:28	54	A	Day
24	1/4/2017	11:2:28-12:1:28	55	A	Day
25.	**Average for day time**		**53**	**A**	**Day**
26.	**Average for night time**		**43**	**A**	**Night**

5.2.3 Water Quality

Table 5. 14: On site Water Quality Result of the Proposed Project Site

No.	Parameters	Unit	Water Quality Result	WHO Guidelines for Water
Water from the Nan Awn Stream (26 March 2017) Keng Teng				
On-site Measurement				
1	pH	pH	7.7	6.5 ~ 8.5
2	Temperature	ºC	24.6	-
3	Electric Conductivity (EC)	µS/cm	67	-
4	Total Dissolved Solids (TDS)	mg/l	67	<1000
5	Salinity	ppt	0.0	-
6	Dissolved Oxygen (DO)	mg/l	7.93	< 10

No.	Parameters	Unit	Water Quality Result	WHO Guidelines for Water
Water from the Nan Pin Stream (28 March 2017) Mong Pyin				
On-site Measurement				
1	pH	pH	8.1	6.5 ~ 8.5
2	Temperature	ºC	23.7	-

No.	Parameters	Unit	Water Quality Result	WHO Guidelines for Water
3	Electric Conductivity (EC)	µS/cm	217	-
4	Total Dissolved Solids (TDS)	mg/l	217	<1000
5	Salinity	ppt	0.0	-
6	Dissolved Oxygen (DO)	mg/l	7.97	< 10

Figure 5. 7: Water quality measurement at Nam Pin Stream

No.	Parameters	Unit	Water Quality Result	WHO Guidelines for Water
Water from the Sin Maung (1 April 2017) Mong Pyin				
On-site Measurement				
1	pH	pH	8.1	6.5 ~ 8.5
2	Temperature	ºC	28	-
3	Electric Conductivity (EC)	µS/cm	83.1	-
4	Total Dissolved Solids (TDS)	mg/l	83	<1000
5	Salinity	ppt	0.0	-
6	Dissolved Oxygen	mg/l	7.7	< 10

No.	Parameters	Unit	Water Quality Result	WHO Guidelines for Water
	(DO)			

No.	Parameters	Unit	Water Quality Result	WHO Guidelines for Water
Water from the Nar Lone Stream, Tar Kaw (1 April 2017) Mong Pyin				
On-site Measurement				
1	pH	pH	8.4	6.5 ~ 8.5
2	Temperature	ºC	25.4	-
3	Electric Conductivity (EC)	µS/cm	250	-
4	Total Dissolved Solids (TDS)	mg/l	250	<1000
5	Salinity	ppt	0.0	-
6	Dissolved Oxygen (DO)	mg/l	8.3	< 10

5.2.4 Biodiversity

5.2.4.1 Inventory Report for the Pankyuu Protected Public Forest

Tree inventory at Pankyuu Protected Public Forest is started at October 6, 2017 and ended at October 9, 2017. The situation of the inspection area is 136 acres of Pankyuu Protected Public Forest. This group included U Maung Pu (Range Officer, Forest Department, Keng Teng), U Chit Nyo (Ranger, Forest Department, Keng Teng), U Nyi Yone (Forest worker, Forest Department, Keng Teng), U Bo Aung Naing (Staff officer, MOEE, Project Manager Office 2, Meikthila), U Nyi Linn Thein (General Manager, Aung Myint Mo Co., Ltd.), U Min Thu (Manager, Aung Myint Mo Co., Ltd.), U Aung Myat Kyaw (Site engineer, Aung Myint Mo co., Ltd.), U Moe Thu Aung (Surveyor, Aung Myint Mo Co., Ltd.). The findings of tree inventory are the species of Hthin Shu, Thit cha, Thit el, lout yar and Bom Mae Zar, Yin Htike, Lat Pan, Zee Phyu and bamboo. The detail list of tree inventory report is attached in the Appendix.

Figure 5. 8. Tree Inventory at Pan Kyuu Protected Public Forest

5.2.4.2 Inventory Report for the Naung Cho Protected Public Forest

Tree inventory at Naung Cho Protected Public Forest is started at October 10, 2017 and ended at October 11, 2017. The situation of the inspection area is 23 acres of Naung Cho Protected Public Forest. This group included U Maung Pu (Range Officer, Forest Department, Keng Teng), U Tin Aung Myo (Ranger, Forest Department, Keng Teng), U Bo Aung Naing (Staff officer, MOEE, Project Manager Office 2, Meikthila), U Nyi Linn Thein (General Manager, Aung Myint Mo Co., Ltd.), U Min Thu (Manager, Aung Myint Mo Co., Ltd.), U Aung Myat Kyaw (Site engineer, Aung Myint Mo co., Ltd.), U Moe Thu Aung (Surveyor, Aung Myint Mo Co., Ltd.). The findings of tree inventory are the species of Hthin Shu, Thit cha, Thit el, Ingyin and lesser known species. And then Vee Sat and Kyu Pin are found as bushes and kya Khat bamboo are found in many places. The detail list of tree inventory report is attached in the Appendix.

Figure 5. 9. Tree Inventory at Naung Cho Protected Public Forest

5.2.4.3 Inventory Report for the Mone Zin Protected Public Forest

Tree inventory at Mone Zin Protected Public Forest is at October 12, 2017. The situation of the inspection area is 4.75 acres of Naung Cho Protected Public Forest. This group included U Zaw Myint (Ranger, Forest Department, Keng Teng), U Yaw Ba (Forest worker, Forest Department, Keng Teng), U Bo Aung Naing (Staff officer, MOEE, Project Manager Office 2, Meikthila), U Nyi Linn Thein (General Manager, Aung Myint Mo Co., Ltd.), U Min Thu (Manager, Aung Myint Mo Co., Ltd.), U Aung Myat Kyaw (Site

engineer, Aung Myint Mo co., Ltd.), U Moe Thu Aung (Surveyor, Aung Myint Mo Co., Ltd.). The findings of tree inventory are the species of Paddauk. The detail list of tree inventory report is attached in the Appendix.

Figure 5. 10. Tree Inventory at Mone Zin Protected Public Forest

5.2.4.4 Biodiversity Survey

We, E Guard study team have been surveyed biodiversity condition of Naung Cho Protected Public Forest cooperate with local Forest Department and Hsinmaung villagers In addition of ground biodiversity survey, we conducted direct interviewed with local villagers who depended on forest for their livelihood e.g hunter. The following are the observation from the ground surveying and interview with villagers.

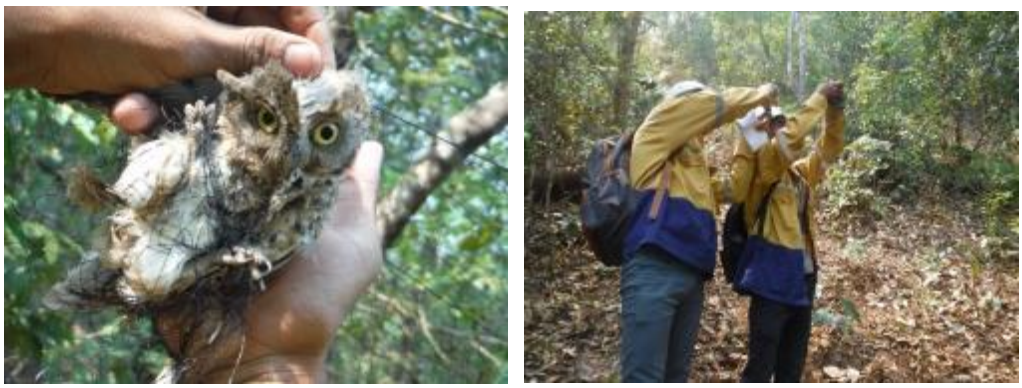


Figure 5. 11: Biodiversity survey at Naung Cho Protected Public Forest

A Birds Species

Local Name	Scientific Name	Common Name	IUCN Red List
Owl	*Athene brama*	Spotted owlet	LC
Ngone	*Cotumix coromandelica*	Rain Quail	LC
Taw kyat	*Gallus gallus*	Red Junglefowl	LC
Boat	*Centropus Sinensis*	Greater Coucal	LC
Pazindoe	*Merops orientalis*	Green Bee-eater	LC
Pigeon	*Columba livia*	Rock pigeon	LC
Deedote	*Ketupa zeylonensis*	Brown fish owl	LC
Birdtaw	*Dicrurus macrocercus*	Black drongo	LC
Birdtaw myechay	*Dicrurus paradiseus*	Greater Racket-tailed drongo	LC
PyanLwar	*Apus affinis*	House swift	LC
Zayat	*Acridotheres tristis*	Common Myna	LC
Botkalon	*Pycnonotus jocosus*	Red-whiskered bulbul	LC
Passerine	*Rhipidura albicollis*	White-throated fantail	LC
SarKaLay	*Passer domesticus*	House Sparrow	LC
Bird kha	*Coracias benghalensis*	Indian roller	LC

B Tree Species

Local Name	Scientific Name	Common Name
Miekaw		
Ingyin	*Shorea siamensis*	Ingyin
Htinshu	*Pinus insularis*	Chir Pine
Swetaw	*Bauhinia acuminata*	Orchid Tree
Latpan	*Salmalia malabarica*	Red silk cotton tree

C Bamboo

Local Name	Scientific Name	Common Name
Wabo	*Dendrocalamus calostachyus*	Bamboo
Neewar		
Mike Khan		
War Kaw		

D Wild Animals

Local Name	Scientific Name	Common Name	IUCN Red List
Gee	*Muntiacus muntjak*	Common Barking Dear	LC
Tawwat	*Sus scrofa*	Wild Bear	LC

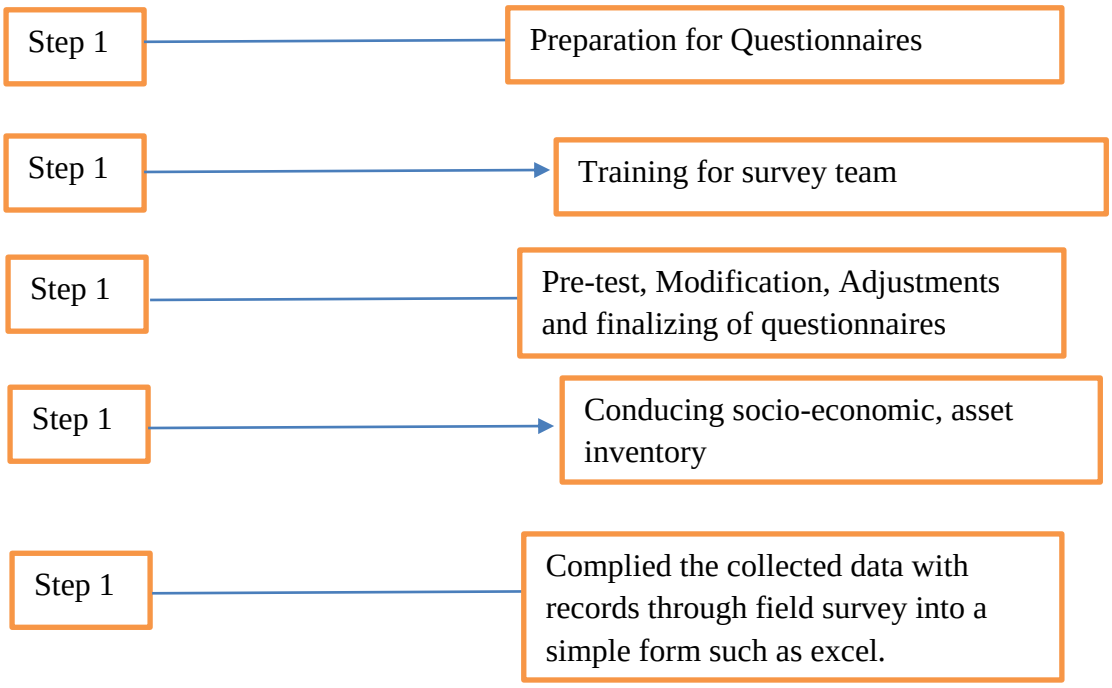
Figure 5. 12: Biodiversity Survey Team

5.2.5 Socio-economic Survey

5.2.5.1 Survey Methodology

The methodology that will be used to design the Social Environmental Survey covers cadastral maps, surveys (census, socio-economic survey, seasonal growing crop survey, prize survey for crop, asset inventory survey, common asset survey and market price survey), analysis of survey results, and reporting.

For Socio-Economic Survey, the survey forms prepared by E Guard Environmental Services Co., Ltd.'s study Team and used for census, socio-economic survey and asset inventory survey. Analysis of the survey data results provides economic and social information, livelihood and agricultural crop and methods. The following figure shows the common steps of surveys.



5.2.5.2 Socio-economic survey result

E Guard's IEE study team interview by dividing two groups, first group include village leaders and representative of villages to survey the overall socio-economic condition, religion and livelihood of their villages. And the second group includes household head or representative of each household to know their family livelihood, income, institution, socio-economic condition, opinion on the proposed project.

According to their responds, some ethnic group such as Larhu, Akhar, Shan are mostly live in the area where transmission line across, their income mainly depends on agriculture, and they have own electricity supply, most of their religion is Christian and a few Budish. They are welcome for this project, but they requested to compensate for crop and land systematically and transparently by coordination with local authority and village leaders. They also wish to get employment opportunity at construction phase. They also want to avoid their crop growing season especially rice and make sure for safety from installation of power transmission, finally they said not to damage their village or farm when constructing of access road or drawing of cable to tower erection area.

Figure 5. 13: Socio- economic survey

The following table shows villages where we surveyed.

Table 5. 15: The villages that we surveyed

Date	Name of villages	Survey Coordinate
24.3.2017	Nanaww	N-21° 16' 19.246" E- 099° 32' 52.321"
	Pankyu	N-21° 16́ 40.923" E- 099° 32́ 23.948"
	Winbo	N- 21° 16́ 19.246" E- 099° 32́ 52.321"
	Panoo	N-21° 16' 40.923" E- 099° 32' 23.948"
25.3.2017	Hopan	N-21° 17́ 32.065" E- 099° 27́ 08.146"
26.3.2017	Manglan	N-21° 20' 46.138" E- 099° 15' 43.533"
27.3.2017	Shwenaungpin	N-21° 18́ 09.741" E-099° 24́ 12.310"
28.3.2017	Taungchay	N-21° 16' 19.246" E- 099° 32' 52.321"
29.3.2017	Pananunglon	
	Koenarkyaung	N-21° 20'22.67" E-99° 09' 08.41"
31.3.2017	Panmaw	
1.4.2017	Hsinmaung	

CHAPTER VI. IDENTIFICATION AND ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS AND ENVIRONMENTAL IMPACT MITIGATION MEASURES

6.1 Identification of Potential Impacts

Assessment of key environmental impacts of the project during construction, operation phase is based on the nature and process of the project and information on the environment. The development of the project will bring changes in the local environment in terms of physical, ecological, economical and socio-economic aspects. There may be some positive and negative impacts in the surrounding environment including human resources. The potential impacts are predicted in terms of each environmental issue, likely impacts during construction, operation and phases. The impacts on the environment from various activities of the project are mentioned in **Figure 6.1.**

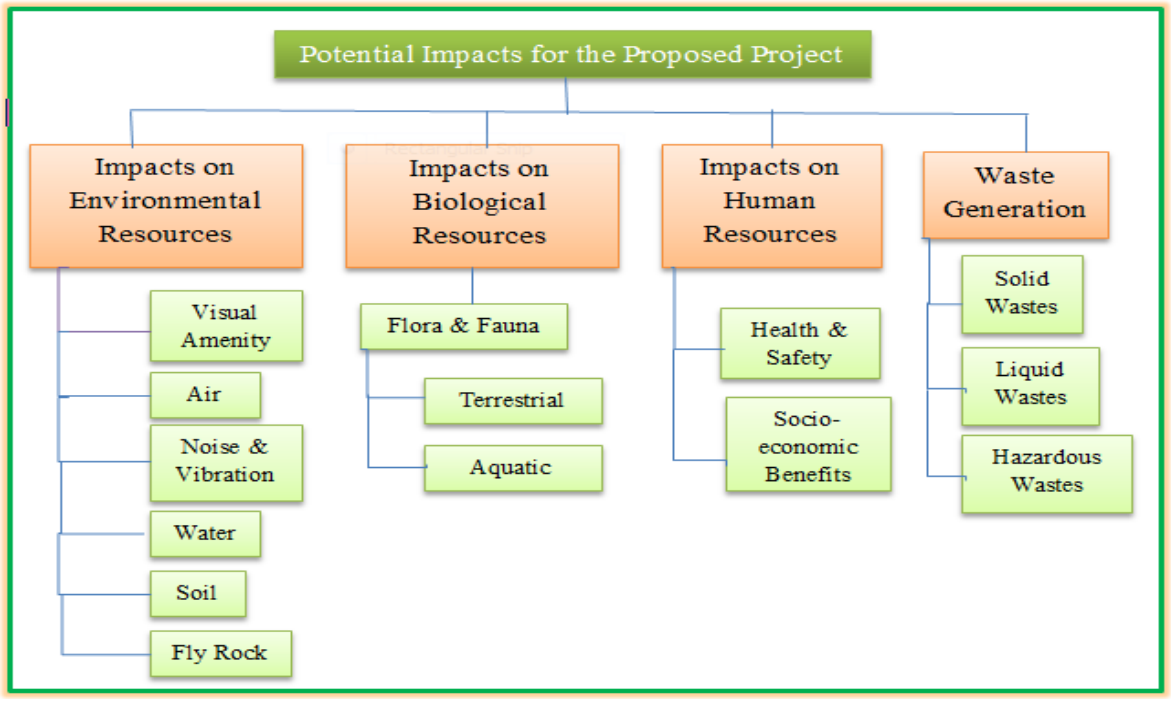


Figure 6. 1: Potential Impacts for the Proposed Project

6.2 Potential Impacts for Construction Phase

6.2.1 Impact on Physical Resources

6.2.1.1 Impact on Topography

The most prominent impact on the surface topography will be due to the removing of the trees in the hilly region that consist of forest area at the tower erection site and all along the Right of Way (ROW) for construction facilitation. This will lead to change in the surface features only. During the construction of the transmission line, the topography will change due to excavation and erection of tower, fill and cut for the leveling the tower erection place. The impact will be irreversible as the present features along the ROW will be changed due to presence of the transmission line.

6.2.1.2 Impact on Climate

Impact on the climate conditions from the proposed projects both during the construction and operation phases will not be significant. CO2 emission from construction vehicles is also not significant.

6.2.2 Impact on Environmental Resources

6.2.2.1 Air pollution

Air pollution such as exhaust fumes from earthmoving equipment as well as construction vehicle associated with the tower erection, movement of transporting vehicles carrying the construction materials, loading and unloading processes, etc. is anticipated. Considering the scale of construction, the negative impact from the construction works will be limited Emissions may be carried over long distances, depending on wind speed and direction, the temperature of the surrounding air, and atmospheric stability. These air emissions may contain Particulate matter (PM), Smoke, Dust, CO, SO_X, NO_2.n.

6.2.2.2 Noise Level

It is anticipated that powered mechanical equipment will be used in construction activities. No blasting is anticipated. Powered mechanical equipment can generate significant noise and vibration. Noise and vibration from the erection of the towers would not be a major consideration as impact is temporary. The noise produced during the construction will have negligible impact on the residents of Villagers as they are too far as already discussed the predominant land use along the most part of alignment is forest area. There will be very limited presence of population being exposed to noise generated during the construction phase.

6.2.2.3 Impact on Surface Water Quality

The construction of the transmission lines will not have any major impact on the surface water quality in the area. Contamination to water bodies may result due to spilling of construction materials and surface runoff from the construction site joining the water body. There may be increase in the turbidity levels in waterways and river where the proposed alignment is crossing and if the surface runoff during construction meets the river. This can be avoided by careful selection of the tower site and the access roads so that the surface runoff does not meet the river. No impact is anticipated on the natural drainage by the implementation of the project. However temporary drainage system for toilets and workshop effluents needs to be developed.

6.2.2.4 Impact on Soil and Geology

The impact on soils will be due to the soil erosion at the tower erection site and along the access routes due to excavation activity and land clearance the erosion prone areas have been minimized while site selection for towers. Leveling and stabilization of tower construction sites will be done after completion of construction activity. Most of the new tower foundations will require excavation for the footings which will generate loose soil leading to potential erosion of adjacent areas including drainages or creeks. Soil erosion may occur in the workshop areas as a result of improper runoff drawn from the equipment washing-yards and improper management of construction activities. It is envisaged that a small area of top soil will be removed due to the digging of soil for the construction of concrete foundation. Foundation design of the towers shall be done considering the probability of occurrence of earthquake at the design stage itself.

6.2.3 Impact on Ecological Resources

- There is no national wildlife park, bird sanctuary, wetland in the close vicinity of the proposed alignment. Although the study area for route alignment have forest area, thick vegetation. The ecological impacts are briefly described in the following sections

6.2.3.1 Impact on Terrestrial Ecology

The initial construction works along the alignment involves land clearance, cutting filling and leveling may cause loss of vegetation. This will be irreversible impact, but it would not significant.

6.2.3.2 Wildlife

For construction of towers, there will have changes on the pasture of wild animal due to cutting of tree and working of people in forest. However, this will be temporary and not significant. Selecting the route alignment, wild life travel routes have been avoided as far as possible during the field visits.

6.2.3.3 Impact on Aquatic Ecology

The proposed transmission line would cross over the river Thanlwin. No significant impacts on aquatic ecology of the river are envisaged, as there will be careful selection of the tower sites near the river, to avoid the river pollution and disturbance to the aquatic fauna of the area.

6.2.4 Impact on Human Environment

6.2.4.1 Community Health and Safety

Health and safety impacts will be in terms of risk of accidents and exposure to electromagnetic fields along the alignment. The accidents may due to electro-cutting, lightening, fires and explosions. The alignments could pose danger to community from electrocution when the new 230 kV lines are being installed particularly if the prescribed safety measures and clearances from the lines are compromised during the construction period.

6.2.4.2 Disease Vectors

Wherever water is allowed to accumulate, in temporary drainage facilities, due to improper wastewater water management, or improper disposal of wastewater generated from the site it can offer a breeding site for mosquitoes and other insects. Vectors such as mosquitoes maybe encountered if open water is allowed to accumulate at the construction campsite.

6.2.4.3 Agriculture

Impact on agriculture would be due to the permanent and temporary loss of agricultural land due to tower erection in the agricultural field and loss of crop for access route etc. There will not be any land acquisition for the tower erection. As far as possible the prime agricultural land will be avoided and the construction will be done after crop harvesting. Moreover, in some agricultural field which crops are damaged will compensate as crop compensation.

6.2.4.4 Socio-economics

Construction of transmission line will generate local employment, because number of unskilled labors (men/women) will be required at the time of construction activities. Local employment during this period will increase socio-economics standards.

6.2.4.5 Occupational Health and Safety

Occupational health and safety hazards associated with the tower erection activities in the operation phase primarily include;

Respiratory hazards which workers are exposing to dust and particulates associated with all phases of the construction activities (i.e., drilling, blasting, transportation). Specifically, workers with long exposure to nuisance dust are at risk for deterioration of health,

Noise; Workers may expose to excessive noise levels such as installation of tower, excavation for footing, transport, standby generators, among others.

Physical hazards; Physical injuries may occur during construction activities e.g., slip, trips and falls, impact with moving machinery such as concrete mixer.

6.2.4.6 Loss of Land Use and Land Conflicts

During Construction, erection of tower will take space for footing in agricultural land, therefore conflicts may happen between local residence and contractor. Moreover, seasonal crop may damage due to construction activities and drawing of cable to erection site. Therefore, impact as loss of land is anticipated during construction activities. For the construction of transmission line or erection of tower, there will not use wide space, so, permanent land acquisition is not required, hence there is no resettlement and rehabilitation is involved in the project.

6.2.4.7 Religious, Cultural and Historical Sites

There are no archaeological, historical or cultural important sites along the route alignment, hence the impacts on these sites are not envisaged.

The location of pagodas, churches, mosques and other cultural and other heritage sites has been reviewed. There is no pagoda, churches, mosque, grave yard, tomb or any other religious/archaeological site within 100m boundary from the edge of the transmission line; therefore, no impact on the site is expected. There will be sufficient buffer distance, so no significant impacts can be expected.

6.2.4.8 Traffic & Transport

Lines of transmission towers are located along thoroughfares in hilly regions of Shan State. Traffic congestion will occur during the foundation works and pole installations, but it will temporary and the impact is not significant.

6.2.5 Waste Disposal

6.2.5.1 Solid Waste Disposal

The small amount of solid waste including petroleum's containers, cement paper bags, food remains and other unwanted materials will be charged to soil during construction process. The solid waste generation will be at the location of the tower erection site which will include food waste, cement bags etc. Cement bags waste and metal scrap will be collected and disposed of in compliance with local authority's disciplines and applicable regulations and rules.

6.2.5.2 Liquid Waste Disposal

It will include generation of sanitary wastewater discharges in varying quantities, depending on the number of workers involved. Liquid waste may include used engine oil and waste generating during maintenance of the machineries. Spillage or leakage of diesel and engine oil from vehicles and machine may release as liquid waste. However, there will be no much liquid waste generates during the construction of transmission line, hence there will no significant impact is envisaged.

6.3 Proposed Impacts for operation stage

6.3.1 Community Health and Safety

Potential impacts of the operation and maintenance of new 230 kV transmission lines would be public injury from unauthorized public access to the towers. risk of accidents and exposure to electromagnetic fields. The accidents may due to electro-cutting, lightening, fires and explosions. The negative health effects from electromagnetic field (EMF) radiation from the transmission line have not been established conclusively by the international medical research community (Appendix E).

6.3.2 Occupational Health and Safety

Worker who would carry out maintenance activities of power transmission line and tower could injury from exposure to electromagnetic fields and risk of accidents.

6.3.3 Waste Disposal

Solid waste as food remains may generate from temporary work camp of maintenance workers. Leakage of oil and diesel from maintenance of vehicles, spilling of wastewater from worker camp.

6.4 ESIA methodology

6.4.1 Objectives of the Study

The objectives of this study are to identify the potential impacts due to project activities on the natural environment and human beings, to highlight the significance of impacts with assessment parameters and its scales and to formulate mitigation measures which are to eliminate or reduce adverse potential impacts on the surrounding environment.

6.4.2 Phases of Construction of Power transmission line Project

The three phases of power transmission line is associated with different sets of environmental impacts. Potential impacts have been differentiated into two main phases of development, i.e. Construction phase, Operation phase.

Construction Phase: This phase will include site preparation, construction of staff camps, oil storage tank, generators houses, workshop, water storage tank, kitchen, toilets and other related activities.

Operation Phase: During the operation phase, only maintenance activities would perform.

The potential impacts associated with the proposed development have been assessed using the criteria given below.

EXTENT

Localized (At localized, scale and a few hectares in extent)	**1**
Study area (The proposed site and its immediate environs)	**2**
Regional (County level)	**3**
National(Country)	**4**
International (Beyond Myanmar)	**5**

MAGNITUDE

Small and will have no effect on the environment	**0**
Minor and will not result in an impact on the processes	**2**
Low and will cause a slight impact on the processes	**4**
Moderate and will result in process continuing but in a modified way	**6**
High (processes are altered to the extent that they temporarily cease)	**8**
Very high and results in complete destruction of patterns and permanent cessation of the processes	**10**

Duration

Very short (0-1 Year)	1
Short (1-5 Years)	2
Medium term (5-15 Years)	3
Long Term (>15 Years)	4
Permanent	5

Probability

Highly improbable (<20%chanceof occurring)	1
Improbable (20 –40%chanceof occurring)	2
Probable (40%-70%chanceof occurring)	3
Highly probable(>70%90%chanceof)	4
Definite(>90%chanceofoccurring)	5

Method used to determine the environmental risk

Risk = (Extent +Duration +Magnitude) x Probability

		CONSEQUENCE (Extent + Duration + Magnitude)																			
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
PROBABILITY	**1**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
	4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
	5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

Low	<30	Where this impact would not have a direct influence on the decision to develop in the area
Medium	30-60	Where the impact could influence the decision to develop in the area unless it is effectively mitigated
High	>60	Where the impact must have an influence on the decision process to develop in the area

SR. No	Environmental Attribute	Proposed Impact	Nature of Impact				Magnitude of Impact			Remarks
			E	M	D	P	Low	Medium	High	
I.	**Impact assessment matrix for construction phase**									
A.	**Physical Resources**									
1.	Topography	* Changes in surface topography	2	2	1	2	✓			Temporary. Small area. Less time.
2.	Climate	* CO2 emission from vehicles	-	-	-	-				
B.	**Environmental Resources**									
1.	Air Pollution	* Particulate matter (PM), Smoke, Dust, CO, SO_X, NO_2	1	4	1	3	✓			Temporary. Small area. Less time.
2.	Noise Pollution	* Generation of noise and vibration from powered mechanical	1	6	1	5		✓		Nuisance from noise of trucks and construction vehicles
3.	Impact on Surface Water Quality	* Spilling of construction materials and surface runoff	2	4	1	3	✓			Temporary. Small area.

		from the construction site joining the water body.								Less time.
4	Impact on Soil and Geology	* Soil erosion at the tower erection site due to excavation activity and land clearance	2	4	1	5		✓		Digging of soil for footing, clearance of land
C.	**Impact on Ecological Resources**									
1.	Impact on terrestrial Ecology	* land clearance, cutting filling and leveling may cause loss of vegetation.	2	6	2	5		✓		Visual amenity would damage
2.	Wildlife	* Changes on the pasture of wild animal due to cutting of tree and working of people in forest.	2	6	2	3		✓		Wild animals may shock due to noise and damage of pasture cause of leveling
3.	Impact on Aquatic Ecology		-	-	-	-				No impact is anticipated.
D.	**Impact on Human Environment**									
1.	Community Health and Safety	* risk of accidents and exposure to electromagnetic fields along the alignment.	2	6	2	3		✓		Injuries may be happened by electromagnetic field and accidents from

										loading trucks
2.	Disease Vectors	* improper wastewater water management, or improper disposal of wastewater generated from the site	2	4	2	3	✓			Temporary. Small area. Less time.
3.	Traffic and transportation	* Pole installation and loading trucks	2	6	1	5		✓		Traffic jam
3.	Agriculture	* Permanent and temporary loss of agricultural land due to tower erection in the agricultural field and loss of crop for access route	2	6	2	3		✓		Crops would be damaged by construction activities.
4.	Occupational health and safety	* Respiratory hazards which workers are exposing to dust * Noise from operation of machine	1	6	2	3	✓			Injury would get from construction activities
5.	Socio-economic	* Local employment opportunity	-	-	-	-				Positive impact
	Loss of Land Use and Land Conflicts	* Conflicts may happen between local residence and	2	8	2	4		✓		Conflicts may happen when pay compensation

		contractor								for crop and land
	Religious, Cultural and Historical Sites	* Unknown historical site may damage due to erection activities	1	2	2	3	✓			Unknown HS may damage
E.	**Waste**									
1.	Solid Waste Disposal	* Solid waste including petroleum's containers, cement paper bags, food remains and other unwanted materials will be charged to soil during construction process.	2	8	2	5		✓		Generation of cement bags, food remaining, other construction waste as plastic bags.
2.	Liquid Waste Disposal	* Liquid waste may include used engine oil and waste generating during maintenance of the machineries.	2	6	2	3		✓		Generation of sanitary wastewater from worker's camp
II.	**Impact assessment matrix for operation phase**									
1.	Community Health and Safety	* Exposure to electromagnetic fields.	2	4	1	3	✓			Need Small number of maintenance workers

2.	Occupational Health and Safety	* Workers can injury from exposure to electromagnetic fields and risk of accidents.	1	8	1	3		✓		May get injury from electromagnetic
3.	Waste Disposal	* Food remain may generate from temporary work camp of maintenance workers	1	6	1	3	✓			Need Small number of maintenance workers

Table 6. 1: Summary of Proposed Impact and Mitigation Measure

Sr. No.	Impact	Impact Level	Mitigation Measure
I.	**Mitigation measure for construction phase**		
A.	**Physical resource**		
1.	Topography	Low	-Provide the best practice for excavation, leveling and clearance of tree within ROW. -Avoid unnecessary excavation and digging works.
2.	Climate	-	No measured impact on the climatic conditions, hence no mitigation is required
B.	**Environmental Resource**		
1.	Air Quality	Low	-Watering at construction site, limited bare soils, maintenance of vehicles etc. -Apply preventive maintenance system, optimizing construction schedule to minimize time that vehicles are in operation. -Burning of waste materials shall be performed at designated areas.
2.	Noise	Medium	-Restriction of noise generating activities at night and use of personal protective equipment like ear plugs, mufflers etc. -Apply periodical inspection of the equipment, limit night work, etc. -Local residents should be given notices of intended noisy activities so as to reduce the degree of annoyances.

	Surface and Ground Water quality	Low	-Careful sitting of towers and access roads. -Apply sediment traps, silt traps, develop fuel handling procedure, proper sewage system, etc. Control the usage of drilling mud, concrete and cement pumping near the river bank or stream channels and avoidance to disposal of construction waste in local water bodies. -Care shall be taken to locate the temporary construction worker sheds away from the water bodies. -Adequate drinking water facilities, sanitary facilities and drainage in the temporary sheds of the construction workers should be provide to avoid the surface water pollution. -Provision of adequate washing and toilet facilities should be made obligatory.
	Soils and Geology	Medium	-Avoiding sites, which are prone to the soil erosion. Systematic Leveling of tower construction sites. -Restoration and stabilization of disturbed land. Implement visual inspection on the presence of oil leakage frequently and provide appropriate spill kits properly.
C.	**Ecological Resources**		
	Terrestrial Ecology	Medium	Location of towers should be at thick vegetated area. Careful selection of few access roads. Compensation to the crops owners to them. - MOEE get permission and agreement from Forest Department to cut and remove tree within ROW and trees within ROW will never replant according to the SOP of transmission line construction and maintenance. However, MOEE will follow instruction of agreement between forest department. - The construction activities will be performed by avoiding the breeding and nesting seasons of the wildlife species.

	Wildlife	Medium	Carefully selection of tower erection area Systematic clearance for tower footing in forest area
	Aquatic Ecology	-	No mitigations will require.
D.	**Human Environment**		
1.	Community Health and Safety	Medium	-The houses will not be allowed within the ROW of the project. - Alignment route away from the settlement. - Avoid any action that can cause accident to local community.
2.	Disease vector	Low	-Provide sufficient first aid kits to workers -Provide health care to workers -Provide adequate waste management system
3.	Occupational Health and safety	Low	-Provide purify drinking water bottles. - Rotating work time. - Provide adequate toilet facilities. - Dispose and transport the explosives and diesel with proper handling methods and safety guidelines; - Develop control and abuse of alcohol and other drugs policy for the workers - Provide Personal Protective Equipment (reflective clothing's, dust mask, safety shoes, hard hats, etc.) - Provide sufficient first aid kids in work site and arrange first aid training for workers.
4.	Agriculture	Medium	- Avoid prime agriculture land. - Need to compensate for seasonal crop. - Construction activity after crop harvesting and selection of few access routes.
5.	Socio- economics		- Unskilled labor and indirect benefits. Overall economic growth of the region.

			- Compensate for damaged seasonal crop if necessary.
6	Cultural sites	Low	-No archaeological, historical or cultural important sites are affected, hence no mitigation required. In case of unidentified artifact or fossil found during details ground check works and excavation for tower footages, stop the works immediately and report to responsible departments.
7.	Traffic and Transportation	Medium	-Avoid high density traffic areas, proper traffic signs at the construction site, ensuring proper access roads. - Avoid high density traffic areas, proper traffic signs at the construction site, ensuring proper access roads. - There is no congestible things, buildings, school etc., in the proposed working area. - Ensuring proper access roads and avoiding road blockage, proper coordination with respected departments for traffic management. -Ensuring proper access roads and avoiding road blockage, proper coordination with respected departments for traffic management. The project area or site is located in the rual area and mostly pass forest and jungle that are not accessible area. Therefore, there will be heavy traffic impact which can cause by construction activities.
8.	Loss of land & land conflicts	Medium	-Need to carry out compensation process for both land acquisition and crop compensation transparently and systematically.
E.	**Waste Disposal**		

1.	Solid Waste Disposal	Medium	- Disposal of surplus materials must also be negotiated through local authority approvals prior to the commencement of construction. - Separated wooden and scrap will be collected and disposed of in compliance with and applicable regulations and rules. -Secure sites for disposing of construction wastes, vegetable debris, installing garbage bins. The used oil will be kept in the designated place and then recycled and reused.
2.	Liquid waste	Medium	- Use leak proof containers for storage and transportation of fuel and lubricants - Do not dispose the solid/liquid wastes into the natural waterways
II.	Mitigation measure for operation phase		
1.	Community health and safety	Low	-Danger signboard for safety, prohibit working near tower area
2.	Occupational health & safety	Medium	- Provide PPE for maintenance workers - Provide training for maintenance activities
3.	Waste	Low	-Provide sufficient dustbin at workers' camp - Generate waste under the control of local authority.

Hazardous Management for the construction phase

The fuel and hazardous materials will be stored at the Taung Gyi office and will transport to each project site. The fuel and hazardous materials were stored separately and managed with rules, instructions, and guidelines.

- ✓ All employees in the construction site should be provided personal protective equipment (PPE) such as uniforms, helmet or hat, ear and eye protection, safety shoes.
- ✓ Marking all energized electrical devices and lines with warning signs.
- ✓ Report and record such as all injuries, near misses, and environmental or property damage, accurately, completely and in a timely manner should be kept.
- ✓ Training of workers in lifting and materials handling techniques in construction phase.
- ✓ Promote safe and healthy working conditions and workforce health and well-being and prohibit any use of forced labor.
- ✓ Maintain clear traffic ways to avoid driving of heavy equipment within the construction site
- ✓ Provide adequate danger sign boards, notice boards and first aid kit to protect fire hazards, accidents and electric shocks within and near the construction site.
- ✓ Provide adequate danger sign boards and notice boards in local languages to protect fire hazards, accidents and electric shocks for local people who work agriculture and children
- ✓ Fire extinguishers are checked once in six months.
- ✓ The adequate amount of extinguishers is kept systematically.
- ✓ The emergency phone numbers of the Regional Fire Stations are significantly described on notice board.
- ✓ The signage and signboards of fire in local languages are set in the noticeable places.
- ✓ The fuel oil are systematically stored and examined regularly not to leak

Figure: Hazardous materials storage

Health and Sanitation Facilities

- Provide adequate toilet facilities.
- Use of personal protective equipment, safety glasses, uniforms.
- A health education campaign and training should be conducted as part of their Occupational Health and Safety measures.
- Construction equipment should be regularly maintained and inspected to prevent from accident cases.
- An Emergency Response Plan shall also be established by the proponent to prevent accidents, fire and natural hazards.
- The health conditions of the workers should be checked regularly by permanent doctor.
- Provide emergency exit contact number in case of fire and accidents
- Provide purify drinking water bottles.
- Rotating work time.

Safety Signature and Their Description

Description	Safety Signage
These signs should be used to make employees and villagers to forbid smoking.	
These signs should be tagged to indicate the location of fire extinguisher, etc.	
These signs indicate all local villagers and employees not to throw away litters carelessly around the project site.	
These signs should be used to make employees and villagers who enter to the construction site worn personal protective equipment within the construction area.	

Description	Safety Signage
These signs indicate all local villagers not to touch the transmission towers and not to go below the transmission lines in rainy season. But the safety signs must be show in local language as much as possible.	
These signs should be tagged to indicate the location of fire extinguisher, etc.	
These signs indicate all local villagers not to enter to the high voltage power lines.	

Personal Protective Equipment (PPE) and Their Functions

Required Personal Protective Equipment	Functions of PPE	Part of Body to be protected	Features and characteristics of PPE
Construction Phases			
Safety Glasses	Protection from bright light, particles and radiation machines	Eye	
Earplugs	Protection from high noise levels	Ear	
Helmet	Use head gear which conforms to recognized safety standards	Head	
Gloves	Protection from of harmful substances, thermal burns, harmful temperature extremes and electric	Hand	

Required Personal Protective Equipment	Functions of PPE	Part of Body to be protected	Features and characteristics of PPE
	shock		
Protective Clothing	Prevention from falling objects, slips and electric shock	Body	
Body	Reflective clothing	For working in busy traffic: brightly-colored reflective clothing can increase the visibility of employees and reduce their chances of being struck by vehicles or machinery	
Safety Footwear	Protection from falling objects, slips, electric shock and burns.	Foot	
Fall Protection Equipment	Protection from falling and slips from transmission towers	For accidents	

CHAPTER -VII PUBLIC CONSULTATION AND RESULTANT

7.1 Methodology and Identification of Stakeholders

The E Guard team met with the DPTSC (PTP) and contractor to discuss and design the consultation process following the requirements of MONREC. The agenda, list of agencies to be invited and draft letters of invitations for township offices, wards, and other relevant agencies were developed. The first small public consultation meeting on environmental issues was held by surveying socio-economic at villages along the route line. Moreover, DPTSC (PTP), contractor and E Guard also held public second public consultation meeting at Mong Pyin and Keng Teng township with relevant stakeholders including villages leader, government offices, and General Administrative Officers (GAOs) and parliament member of respective township at affected townships, media etc.

The principles of information dissemination, solicitation, integration, coordination, and engagement into dialogue were incorporated during the consultations. The key informants who were interviewed were selected based on the sector most likely to be affected by the project and from whom information on site facts and prevailing conditions were collected. The opinions of all those consulted helped in the planning and design of the transmission line corridor.

7.2 Schedule of Small Public Consultation Activities

The following tables show the villages that we held small public consultation meetings

Table 7. 1: Schedule of Small public consultation activities

Date	Name of villages	Coordinate	Purpose
24.3.2017	Nanaww	N-21° 16' 19.246" E- 099° 32' 52.321"	To present the project concept design and obtain information and views on environmental, land use and cultural issues at project sites.
	Pankyu	N-21° 16́ 40.923" E- 099° 32́ 23.948"	Ditto
	Winbo	N- 21° 16́ 19.246" E- 099° 32́ 52.321"	Ditto

	Panoo	N-21˚ 16' 40.923" E- 099˚ 32' 23.948"	Ditto
25.3.2017	Hopan	N-21˚ 17́ 32.065" E- 099˚ 27́ 08.146"	Ditto
26.3.2017	Manglan	N-21˚ 20' 46.138" E- 099˚ 15' 43.533"	Ditto
27.3.2017	Shwenaungpin	N-21˚ 18́ 09.741" E-099˚ 24́ 12.310"	Ditto
28.3.2017	Taungchay	N-21˚ 16' 19.246" E- 099˚ 32' 52.321"	Ditto
29.3.2017	Pananunglon		Ditto
	Koenarkyaung	N-21˚ 20'22.67" E-99˚ 09' 08.41"	
31.3.2017	Panmaw		Ditto
1.4.2017	Hsinmaung		

No.	**Description**	
1.	Pan Kyu village Small stakeholder meeting and socio-economic survey	

2.	Hopan village Small stakeholder meeting and socio-economic survey	
3.	Monn Lan village Small stakeholder meeting and socio-economic survey	

7.3 Public Consultation Meeting at Townships

The first small public consultation of the proposed project was held at almost villages located along the route line and the second Public consultation was held in two townships and consisted of the following component procedures:

a. Presentation of the proposed project, benefits/disadvantages and mitigation measures to address any environmental impacts by the contractor of DPTSC (PTP);

b. Presentation of the objectives of the public consultation and the EIA study and the overview of the proposed transmission line alignments by the E Guard team and

c. Open discussion on comments of stakeholders about the project and environmental issues that should be considered in the project design.

Representatives from the townships Keng Teng and Mong Pyin, various departments attended the meeting. The proposed project was presented by U Nay Min, Project Manager, Aung Myint Mo Co., Ltd. After which, the purpose of the public consultation and the environment safeguards and the initial alignment of the transmission line was presented by the E Guard environment consultant. The summary of comments from the stakeholders identified during the public consultations and the responses of DPTSC (PTP) and project contractor are summarized for each township as below.

7.3.1 Public Consultation at Kyeintone Township,

E Guard Environmental Services Co., Ltd.
Meeting Minutes

Subject: Public Hearing for Power Transmission Line Project (Phase 2)	**Date:** 24th July 2017.
Venue: General Administrative Department Hall, Keng Teng	**Time:** 10:00 AM to 12:00 PM
Attendees: Total: 58 Government Department: 28 Media: 5 Local People: 22 Company: 2 Hlutt Taw: 1	
Note Taker: Daw Shwe Ya Min Bo	

Agenda:

1. Opening Ceremony.
2. Presentation of Project Planning by U Min Thu, Project Manager, Aung Myint Mo Co., Ltd.
3. Presentation of Environmental and Social Considerations in Project by U Soe Min, Managing Director, E Guard Environmental Services Co., Ltd.
4. Recommendations and suggestions by Attendees.
5. Closing Remark by U Win Maung Maung, Deputy Director, Ministry of Energy and Electricity.
6. Closing Ceremony.

1. Opening Ceremony.

2. Presentation of Project Planning by U Min Thu, Project Manager, Aung Myint Mo Co., Ltd.

U Min Thu, Project Manager, Aung Myint Mo Co., Ltd. gave a brief explanation about the Nam Sam- Mine Pyin- Keng Teng 230kV (Tar Kaw Bridge to Monepying) and (Mongpying to Kengtung) Power Transmission Line 74.4 Miles (Section – 2) Project. The objectives of this project are to get electricity for the public in the area concerned with the project, to get better safe transportation system and to develop socio-economic conditions of the villages near the project area. He reported the background of the project, the location of the project, the performed constructional activities such as soil test, the environmental and social activities, total number of section and google earth photos and drone photos of the way in line with this transmission line. He told that the investment costs and the detailed constructional time schedule.

3. Presentation of Environmental and Social Considerations in Project by U Soe Min, Managing Director, E Guard Environmental Services Co., Ltd.

U Soe Min, Managing Director, E Guard Environmental Services Co., Ltd explained the impacts of the projects and mitigation measures at three phases such as pre-construction, construction and operation. He also explained environmental and social considerations of the project. We surveyed air quality, water quality and soil quality by using surveying instruments. We also thought that the impacts on biodiversity.

4. Recommendations and suggestions by Attendees.

(1) U Aung Kyaw Min (Staff officer, Agriculture)

Question: How much the distance between the tower station and the main road?

How much the highest length of tower and the lowest length of tower?

How much the distance between each tower and another?

How many miles are there along the power transmission line?

How much budgets are used for this project?

Answer: The distance between the tower station and the main road is 800- 1000 feet (minimum) and 1600 feet (maximum).

The highest length of tower is 80 feet (35 m) and the lowest length of tower is 45 -50 feet (19 m).

The distance between each tower and another is 600- 1200 m (approximately).

Myanmar kyats 42445754.19 million are used for this project.

(2) U Sai Htwee (Farmer agent)

Question: What is the width of the base of the tower? Now, there is no electricity in their town, and after finishing project, he want to get electricity.

Answer: The width of the base of the tower of groove is 15 feet and the final foundation block is 1.5 feet width. Distribution is arranged by office.

(3) U Khin Maung Htun (YCDC, Chairman)

Question: How about the design of tower? How long time is need for one tower? He said that he want to know Aung Myint Mo Company Profile, so need to present it.

Answer: The design of the tower is still editing. One season is needed for one tower.

(4) U Soe Naing (Department of Planning, Assistant Director)

Question: Is that budget for compensation?

Answer: No, it is not for compensation.

(5) U Sai Shein Twee (Administrator)

Question: How can farmer know whose TaungYa are affected?

Answer: The affected TaungYa are confirmed by GPS point.

(6) U Ko Ko Myo (Staff officer, FD)

He wants soft copy of report for preparation of forest work.

5. Closing Remark by U Win Maung Maung, Deputy Director, Ministry of Energy and Electricity

U Win Maung Maung, Deputy Director, Ministry of Energy and Electricity said that I thank all of the attendees today Public Hearing. I also thank for your suggestions and recommendations.

6. Closing Ceremony.

7.2.2 Result of Public Consultant at Mong Pyin Township

E Guard Environmental Services Co., Ltd. **Meeting Minutes**	
Subject: Public Hearing for Power Transmission Line (Section-2) Project	**Date:** 25, July 2017.
Venue: Meeting Room, Minepyin Administrative Department	**Time:** 9:00 am- 11:00 am
Attendees: Government-42 Local People-16 Company-2 Total-60 Persons	
Note Taker: Daw Aye Nyein Thu	

Agenda:

1 Opening Ceremony.

2 Opening Remark by U San Htun, Township Administrative Officer from Minepyin Administrative Department.

3 Presentation of Project Planning by U Min Thu , Manager from Aung Myint Mo Co., Ltd.

4 Presentation of Environmental and Social Considerations in Project by U Soe Min, Director, E Guard Environmental Services Co., Ltd.

5 Recommendations and suggestions by Attendees.

6 Closing Remark by U Win Maung Maung, Deputy Director from Ministry of Electricity and Energy.

7 Closing Ceremony.

1 Opening Ceremony.

2 Opening Remark by Township Administrative Officer from Minepyin Administrative Department.

He said that today meeting is the public hearing for 230 kV Nanpsam- Mong Pyin- Keng Teng (78) miles Power Transmission Line (Section-2) Project operating by Aung Myint Mo Co., Ltd. The objective of this meeting is to inform about the project and explain about the process of the environmental impact assessment and social consideration included in the Initial Environmental Examination (IEE) according to the procedure included in the Environmental Conservation Law (2012). Finally, he requested to the attendees to give some advices for the project and ask questions associated with project.

3. Presentation of Project Planning by U Min Thu, Manager from Aung Myint Mo Co., Ltd.

He presented about their company's proposed project, their line route plan, their budget and their proposed project date. He explained that they are reporting the tower designs to the Ministry of Electricity and Energy. He explained that the Ministry of Electricity and Energy will solve the crop compensation and the detailed line route plan in cooperating with the local people and the associated Government.

4. Presentation of Environmental and Social Considerations in Project by U Soe Min, Director, E Guard Environmental Services Co., Ltd.

U Soe Min, Director, E Guard Environmental Services Co., Ltd explained about the environmental and social considerations of the project. He explained not only the environmental and social impacts that would be occurred during the construction and operation phases but also the advantages that can get from the project. And he discussed about the mitigation measures for the environmental and social impacts. He also explained the environmental quality measurement for baseline environmental condition. He carefully discussed about resettlement for project affected persons (PAPs) and the crop compensation for the cropping season in the operation phase. He requested the attendees to tell and discuss their perceptions on this project.

5. Recommendations and suggestions by Attendees.

(1) **Question (Tone Tar Village)**: How can I solve the problem that my Taung Ya is so closed to the route of transmission line?

Answer (U Win Maung Maung, Deputy Director from Ministry of Electricity and Energy): We have plan to pay the crop compensation to the people who are affected with the route of power transmission line when the construction stage. You can plant the taung ya as your planting design and as much as you can.

Suggestion (U Soe Min, E Guard Environmental Services Co., Ltd.): You must study your taung ya location and you should record your planted crop kind, the yield of crop production and the season of crop planting.

(2) **Question (Black and White):** How can we solve the problem that the villagers with no evidence of land ownership (design 7)?

Answer (U Win Maung Maung, Deputy Director from Ministry of Electricity and Energy): You should try to make the evidence of land ownership (design 7).

(3) **Question (The Latest one):** How many the tower between the Tar Kaw Bridge and Minepyin (26) miles?

Answer (U Min Thu, Manager of Aung Myint Mo Co., Ltd.): There are 108 towers between the Tar Kaw Bridge and Mong Pyin (26) miles. Ministry of Electricity and Energy will apply the crop compensation only.

6. Closing Remark by U Win Maung Maung, Deputy Officer from Ministry of Electricity and Energy.

He said that he is very thankful for the suggestions and questions of the villagers and government on behalf of the Ministry of the Electricity and Energy and the Project Proponent, TBEA Co., Ltd.

The advice, suggestion and request of the stakeholders were implemented and if the stakeholders want to give additional advice, suggestion and request, its can be able to communicate with the companies by phone, email or post mail to the company.

7. Closing Ceremony

CHAPTER VIII-INSTITUTIONAL REQUIREMENT AND ENVIRONMENTAL MANAGEMENT PLAN

8.1 Institutional Requirement

This Initial Environmental Examination (IEE) is prepared as an environmental management framework for AUNG MYINT MO Co., Ltd. The environmental management practices, procedures and responsibilities are defined here in to get full compliance with the existing environmental policy, laws, rules and instructions of the Republic of the Union of Myanmar. The project proponent should appoint one Health, Safety and Environment (HSE) Coordinator or Environmental staff throughout the lifespan of the project. The Environmental staff of AUNG MYINT MO Co., Ltd. will review and update this plan during construction phase cover all potential impacts, amendments and modifications. Revisions will be made as need throughout the construction phase AUNG MYINT MO Co., Ltd. is a responsible party for this Environmental Management plan of the construction of power transmission line. Any suggestions, comments and questions should be directed to AUNG MYINT MO Co., Ltd.

After construction of power transmission line, Ministry of Electricity and Energy would take responsible for the implementation of Environmental Managements Plan and other plans.

8.2 Environmental Management Plan

The Environmental Management Plan (EMP) prepared for the proposed project covers the anticipated impacts of the said project, mitigation measures, management and monitoring plans during each of the phases:

- Construction Phase,
- Operation Phase and

The objectives of EMP are as follows:

- Identify the possible environmental impacts of the proposed activities;
- Develop measures to minimize, mitigate and manage these impacts and
- Estimate the budget of EMP for each phase.

During construction phase, AUNG MYINT MO Co., Ltd. must manage the development of the proposed project by implementing the EMP which is composed of four parts as follows:

1) **Environmental Management Plan**
2) **Environmental Monitoring Plan**
3) **Community Health and Safety Plan**
4) **Community Health and Safety Plan**
5) **Emergency Preparedness and Response Plan,**

The Environmental Management Plan and Environmental Monitoring Plan for decommission phase are excluded in this report because it will carry out according to the situation of this project and each tower would replace every time after their lifespan

8.2.1 Responsibilities of the EMP

In order to effectively implement of the EMP, it will be necessary to define the responsibility of various stakeholders. The environmental management activities should be in compliance with existing environmental policy, laws, rules, procedures and emission standards of the Republic of the Union of Myanmar. The following entities are responsible for implementation of the EMP:

1. AUNG MYINT MO Co., Ltd. (Construction Phase)
2. DCSP under the Ministry of Electricity and Energy (Operation Phase)
3. Environmental Conservation Department (Shan State)
4. Third-party Environmental Consultant Firm

8.2.2 Institutional Arrangements and Responsibilities

The primary management framework responsible for the implementation of the EMPs for the 230 kV transmission lines is summarized as follows. The MOEP is the executing agency (EA) while the DPTSC (PTP) is the Implementing Agency (IA). With assistance from an overall Project Implementation Unit (PIU), the IA will implement the transmission lines, and the EMP.

The PIU is supported by the Environmental Consultant for planning of environmental management plan. For the implementation of EMP during the construction phase, the PIU will take responsible and in operation phase, the IA will take responsibilities to implement. The PIU must assign the Environmental staff or HSE coordinator during construction phase to successful implementation of EMP. The HSE coordination also delivers required capacity development and training to the construction workers. A summary of indicative responsibilities for implementation of the EMP is provided below.

The responsibilities of the EA (MOEP) include:

i. Overall responsibility to inspect implementation of EMP;
ii. Provide coordination and supervision for environmental and social safeguards;
iii. Submit semi-annual environmental monitoring reports to ECD;
iv. Coordinate with PIU on the resolution of issues arising from the implementation of EMP.

The responsibilities of the PIU or contractor includes:

i. Assist the PIC in updating the EMP to meet final detailed designs of 230 kV transmission lines;
ii. Notify MONREC to confirm approvals of 230 kV lines are met;

iii. Closely coordinate with local authority and local people prior to the implementation of the project to ensure safety clearances are met along the transmission line ROW;

iv. Lead follow-up meetings with all affected stakeholders;

v. Undertake day-to-day management of EMP implementation activities;

vi. Closely coordinate with local authority and local people prior to the implementation of the project to ensure safety clearances are met along the transmission line ROW;

vii. Lead follow-up meetings with all affected stakeholders;

viii. Undertake day-to-day management of EMP implementation activities;

ix. Prepare and submit semi-annual reports on EMP implementation to IA/EA;

x. Undertake regular construction site inspections to ensure site workers implements EMP properly; and

xi. Ensure HSE manager submits monthly reports on environmental mitigations and monitoring.

xii. Prepare and submit monthly reports on mitigation and monitoring activities of CEMP any environmental issues at construction sites to the IA and ECD.

xiii. Perform any required laboratory analyses according to the monitoring programs during the construction phase;

The responsibilities of the PIC or E Guard Environmental Services Co., Ltd are:

i. Prepare the EMP to meet final detailed design of 230 kV lines

ii. Provide technical direction and support to PIU for implementation and monitoring of EMP;

iii. Provide advice and support to contractor or PIU with their monitoring activities;

Environmental Staff or HSE Coordinator

Environmental Staff or HSE Coordinator is responsible and accountable for ensuring

- Observe HSE regulations, wears all required safety equipment, encourages safe working practices, corrects obvious hazards immediately or reports them to the General Manager of construction site.
- Development of HSE culture among all workers, during construction and operation
- Regular site visit and reporting during construction and operation works to check whether the objectives of EMP are being followed.
- Manage safety and health in the erection of tower and construction activities, and also maintenance activities in construction phase.
- Keep full records of environmental management activities and present to independent third-party environment audit.
- Assess the risk on surrounding environment, workers and community in performing

various steps of all construction processes.

- Undertaking regular safety and health inspections and audits onsite.
- Ensure equipment to be regularly checked and properly maintained
- Provide necessary information and instructions, as well as providing and arranging training to the workers and supervising them to follow safety rules and safe working procedures strictly.

HSE Assistants or Environmental staff

The HSE Assistants are responsible for assistant HSE Coordinator during the implementation of HSE plan

- Development and training of the HSE plan.
- Liaise with local authorities where required, to ensure safety and health issues are resolved in a timely manner, to the benefit of the project.

ECD (Shan State)

ECD (Shan State) is responsible for the general supervision and coordinating over all matters relating to the environment and also for providing guidance for existing regulatory frameworks.

Third-Party Consultant Firm

The Third-Party Consultant Firm is to ensure that the EMP developed is up-to-date and is being followed properly by AUNG MYINT MO Co., Ltd. Periodic audits shall be performed in order to find out whether the expected outcomes are achieved as envisaged in the plan by comparing with the operating standards. If not, corrective actions have to be followed.

The detailed Environmental Management Plan based on the project activities is described in the following tables.

Table 8 1: Environmental Management Plan Construction Phase

Sr. No	Environmental Attribute	Location	Proposed Impact	Mitigation Measure	Estimated cost for proposed measure	Residual Impact	Responsible party
I.	**Environmental Management Plan for construction phase**						
A.	**Physical Resources**						
1.	Topography	All tower erection area	Changes in surface topography	Provide the best practice for excavation, leveling and clearance of tree within ROW. Avoid unnecessary excavation and digging works	Lump sum	Negligible	HSE manager of PIU
2.	Climate	-	Co2 emission from vehicles	No measured significant impact on the climatic conditions, hence no mitigation is required		Negligible	
B.	**Environmental Resources**						
1.	Air Pollution	All tower erection area	Particulate matter (PM), Smoke,	Watering at construction site, limited bare soils, maintenance of vehicles	2000	Negligible	HSE manager of PIU

			Dust, CO, SO_X, NO_2	etc. -Apply preventive maintenance system, optimizing construction schedule to minimize time that vehicles are in operation. -Burning of waste materials shall be performed at designated areas.			
2.	Noise Pollution	All tower erection area	Generation of noise and vibration from powered mechanical	-Restriction of noise generating activities at night and use of personal protective equipment like ear plugs, mufflers etc. -Apply periodical inspection of the equipment, limit night work, etc. -Local residents should be given notices of intended noisy activities so as to reduce the degree of annoyances.	1000	low	HSE manager of PIU
3.	Impact on	All tower	Spilling of	Careful sitting of towers	3000	Negligible	HSE

	Surface Water Quality	erection area	construction materials and surface runoff from the construction site joining the water body.	and access roads. -Apply sediment traps, silt traps, develop fuel handling procedure, proper sewage system, etc. Control the usage of drilling mud, concrete and cement pumping near the river bank or stream channels and avoidance to disposal of construction waste in local water bodies. -Care shall be taken to locate the temporary construction worker sheds away from the water bodies. -Adequate drinking water facilities, sanitary facilities and drainage in the temporary sheds of the construction workers should be provide to avoid the surface water pollution.			manager of PIU

				-Provision of adequate washing and toilet facilities should be made obligatory.			
4	Impact on Soil and Geology	All tower erection area	Soil erosion at the tower erection site due to excavation activity and land clearance	-Avoiding sites, which are prone to the soil erosion. Systematic Leveling of tower construction sites. -Restoration and stabilization of disturbed land. Implement visual inspection on the presence of oil leakage frequently and provide appropriate spill kits properly.	3500	low	HSE manager of PIU
C.	**Impact on Ecological Resources**						
1.	Impact on terrestrial Ecology	All tower erection area	land clearance, cutting filling and leveling may cause loss of vegetation.	Location of towers should be at thick vegetated area. Careful selection of few access roads. Compensation to the crops owners to them.	2000	low	HSE manager of PIU

2.	Wildlife	All tower erection area	Changes on the pasture of wild animal due to cutting of tree and working of people in forest.	Careful selection of tower erection site	Lump sum	Low	HSE manager of PIU
3.	Impact on Aquatic Ecology		No significant impact	No mitigations will require.			
D.	**Impact on Human Environment**						
1.	Community Health and Safety	All tower erection area	risk of accidents and exposure to electromag netic fields along the alignment.	The houses will not be allowed within the ROW of the project. - Alignment route away from the settlement. - Avoid any action that can cause accident to local community.	1500	low	HSE manager of PIU
2.	Disease Vectors	All workers' camp	improper wastewater water	-Provide sufficient first aid kits to workers -Provide health care to	3000	Negligible	HSE manager of PIU

		area	management, or improper disposal of wastewater generated from the site	workers -Provide adequate waste management system			
3.	Agriculture	All tower erection area & access road	Permanent and temporary loss of agricultural land due to tower erection in the agricultural field and loss of crop for access route	-Avoid prime agriculture land. -Need to compensate for seasonal crop. -Construction activity after crop harvesting and selection of few access routes.	Lump sum	Low	HSE manager of PIU
4.	Occupational health and safety	All tower erection area	Respiratory hazards which workers	Provide purify drinking water bottles. - Rotating work time. - Provide adequate toilet	3500	Negligible	HSE manager of PIU

			are exposing to dust Noise from operation of machine	facilities. -Dispose and transport the explosives and diesel with proper handling methods and safety guidelines; -Develop control and abuse of alcohol and other drugs policy for the workers -Provide Personal Protective Equipment (reflective clothing's, dust mask, safety shoes, hard hats, etc.) -Provide sufficient first aid kids in work site and arrange first aid training for workers.			
5.	Socio-economic		Local employment opportunity	-Unskilled labor and indirect benefits. Overall economic growth of the region. - Compensate for damaged seasonal crop if necessary.			PIU
	Loss of Land	All tower	Conflicts	Need to carry out	Lump sum	Low	PIU

	Use and Land Conflicts	erection area & access road	may happen between local residence and contractor	compensation process for both land acquisition and crop compensation transparently and systematically.			
	Religious, Cultural and Historical Sites	All tower erection area & access road	Unknown historical site may damage due to erection activities	No archaeological, historical or cultural important sites are affected, hence no mitigation required. In case of unidentified artifact or fossil found during details ground check works and excavation for tower footages, stop the works immediately and report to responsible departments.	Lump sum	Negligible	HSE manager of PIU
E.	**Waste**						
1.	Solid Waste Disposal	All workers' camp	Solid waste including petroleum's containers,	Disposal of surplus materials must also be negotiated through local authority approvals prior to the	2000	Low	HSE manager of PIU

			cement paper bags, food remains and other unwanted materials will be charged to soil during constructio n process.	commencement of construction. -Separated wooden and scrap will be collected and disposed of in compliance with and applicable regulations and rules. -Secure sites for disposing of construction wastes, vegetable debris, installing garbage bins. The used oil will be kept in the designated place and then recycled and reused.			
2.	Liquid Waste Disposal	All workers' camp	Liquid waste may include used engine oil and waste generating during maintenanc e of the	Use leak proof containers for storage and transportation of fuel and lubricants -Do not dispose the solid/liquid wastes into the natural waterways	3000	Low	HSE manager of PIU

			machineries.				
II.	**Impact assessment matrix for operation phase**						
	Community Health and Safety	All tower maintenance area	Exposure to electromagnetic fields.	-Danger signboard for safety, prohibit working near tower area	1500	Negligible	HSE manager of IA
	Occupational Health and Safety	All tower maintenance area	Workers can injury from exposure to electromagnetic fields and risk of accidents.	-Provide PPE for maintenance workers -Provide training for maintenance activities	5000	Low	HSE manager of IA
	Waste Disposal	All maintenance	Food remain may	-Provide sufficient dustbin at workers' camp	2500	Negligible	HSE manager of IA

		workers' camp	generate from temporary work camp of maintenance workers	-Generate waste under the control of local authority.			

8.3 Environmental Monitoring Plan

Monitoring of the environmental and social impacts in the receiving environment is important in evaluating the effectiveness of the Mitigation Plan so as to comply with the existing regulatory measures. During the construction and operation phase monitoring will be undertaken to ensure the proposed mitigation measures for negative impacts as well as enhancement measures for positive impacts.

8.3.1 Monitoring Parameters

The monitoring parameters were selected based on impacts identified in the construction, operation phases. The parameters determined will reflect the effectiveness of the mitigation measures and general environmental performance of the project. Monitoring of the parameters will be carried out at the various stages of the project as follows:

Construction Phase: To determine the impacts that might arise from the construction of the power transmission line.

Operation Phase: To determine the impacts that might arise from the maintenance activities of power transmission line during operation phase.

Table 8. 2: Environmental and Social Monitoring Plan (Construction of power transmission line)

Item	Environmental Concerns	Parameters	Frequency	Location	Estimated Cost (USD) (000)	Responsible Party
A	**Construction Phase**					
Environmental Impacts						
1.	Exhaust from diesel generators	Suspended Particulate Matter	Quarterly	Stack of diesel generator sets, operation of batching plants	1,000	HSE manager of PIU

2.	Water Quality	PH, Color, Turbidity, Total Hardness, CaCo3, BOD, Total Dissolved Oxygen and Total Suspended Solid and Temperature	After Construction activities	Water from Thanlwin river and nearest stream	4,000	Ditto
3.	Domestic Waste Disposal,	Waste segregation and collection system	Weekly	Disposal of domestic waste	200	Ditto
4.	Septic tank and sewage system	Waste transfer notes	Yearly	Sludge from septic tank	200	Ditto
Socio-economic/Occupational Health Impacts						
1.	Employment Opportunities	Percentage of local construction workers	Quarterly	Project Site: Site inspection	x	HSE Manager

3.	Safety and Health Risk	Number and type of safety equipment provided. Health and sanitation facilities in camps. Signage PPE, Fire evacuation, emergency plan, Personnel hygiene standards, healthcare services and facility	Monthly	Project site: number of safety facilities provided	20,000	Ditto
4.	Accidents	Safety training for workers, accident reports, community consultations	Monthly	Project site; No lost time accidents	5,000	Ditto
B.	**Operation Phase**					
2.	Noise level	Noise level dBA	Once	At all villages located	10,000	HSE manager of DPTSC
4.	Domestic Waste Disposal,	Waste transfer notes	Weakly during maintenance	Disposal of domestic waste	200	Ditto
5.	Septic tank and sewage system	Waste transfer notes	Yearly	Sludge from septic tank	200	Ditto

Socio-eco /Impacts						
1.	Socio-economic aspects	Employment, Local economy,	Daily	Entire site	50,00	Ditto

8.3.2 Community Health and Safety Plan

This community health and safety plan is intended to implement during the construction and operation phases of the project. It aims to provide maximum safe and sound working environment for the workers on site. This can be placed in safe condition by adopting the following measures for prevention of accidents and hazards:

- The waste materials and unnecessary soil produced from digging for footing of tower are disposed in designated area according to local authorities low ground lands.
- The drainages are systematically made to become good water course in roads within workplace.
- To decrease accidents, the accidents with vehicles along the access roads in tower erection work site are protected and managed.
- The flagstaff and signage are made in vehicles and machines operating within the project site.
- The precautions related with occupational health and safety, environmental conservation and community health and safety caused by construction of power transmission line and maintenance activities are needed to implement systematically.
- The instructions for health and safety related with construction of power transmission line are needed to follow.
- It is needed to provide appropriate first aid training to the workers and first aid facilities at the site.

8.3.3 Emergency Preparedness and Response Plan

The purpose of emergency planning is to minimize the effects of an emergency that occurs at a proposed project site, to protect the loss of lives and properties from emergency cases and to be aware the natural and man-made disasters. The emergencies arising from the proposed project are fire hazards, oil spills and soil erosion to cause environmental damage which disrupts or shutdown of operations and physical equipment damage or environment. Emergency prevention through well management, operation, maintenance and inspection can reduce the probability of occurrence and consequential control the effect of such outcomes.

(a) Oil Spill Response Plan

Any oil spills, regardless of size must be contained and cleaned up in a safe and effective manner. Spills that can threaten public health or the environment will need to be attended immediately. In order to determine the proper response procedures, type of discharges can be classified into ‘incidental’ and ‘non-incidental’ depending on the following characteristics:

Table 8. 3: Oil Spill Response Criteria

Incidental discharges	Non-Incidental discharges
The discharge is small (e.g., less than 20 gallons)	The discharge is large enough to spread beyond the immediate area.
The discharge can be easily contained	The discharge cannot be contained
The discharge is unlikely to reach a navigable	The discharge may reach a navigable waterway, storm sewer, or sanitary drain
Cleanup procedures do not pose a health or safety hazard	The discharge requires special equipment or training to clean up
Proper response equipment is available for a safe clean up	The discharge poses a hazard to human health

(b) Fire Fighting

The fire hazards can be occurred from use of explosive materials near diesel storage tanks and also from surrounding local communities. But, the potential fire hazards in the proposed project area are low. The procedures for firefighting are:

- Inspect fire extinguishers and combustible materials in every workplace;
- Give fire hazardous training to workers and the nearby communities;
- Deliver oil spill disposal records and provide accurate information efficiently to the manager;
- Provide accurate information and organize training sessions to prevent future spills.

8.3.4 Corporate Social Responsibility Plan

The proponent of the proposed project will implement the following CSR plan after construction activities and during construction to develop the local and regional community as a supporting to the country. The CSR plan which implemented by the project proponent or PIU is described in **Table 8.4.**

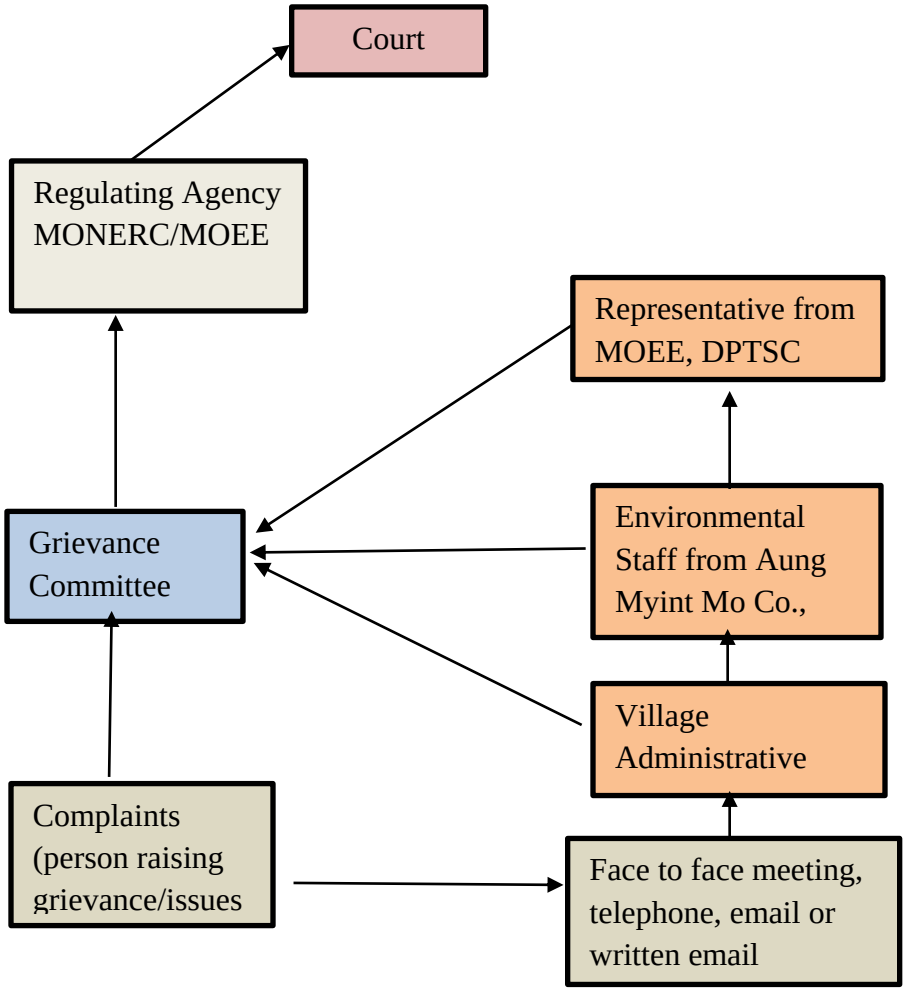
Table 8. 4: Corporate Social Responsibility Plan for Aung Myint Oo Co., Ltd.

No.	Activity	Responsible Company	Frequency	Estimated Amount (% of Net Profit)
1.	Contribution to develop Education sector	Aung Myint Mo Co., Ltd.	Annually during construction phase	0.30%

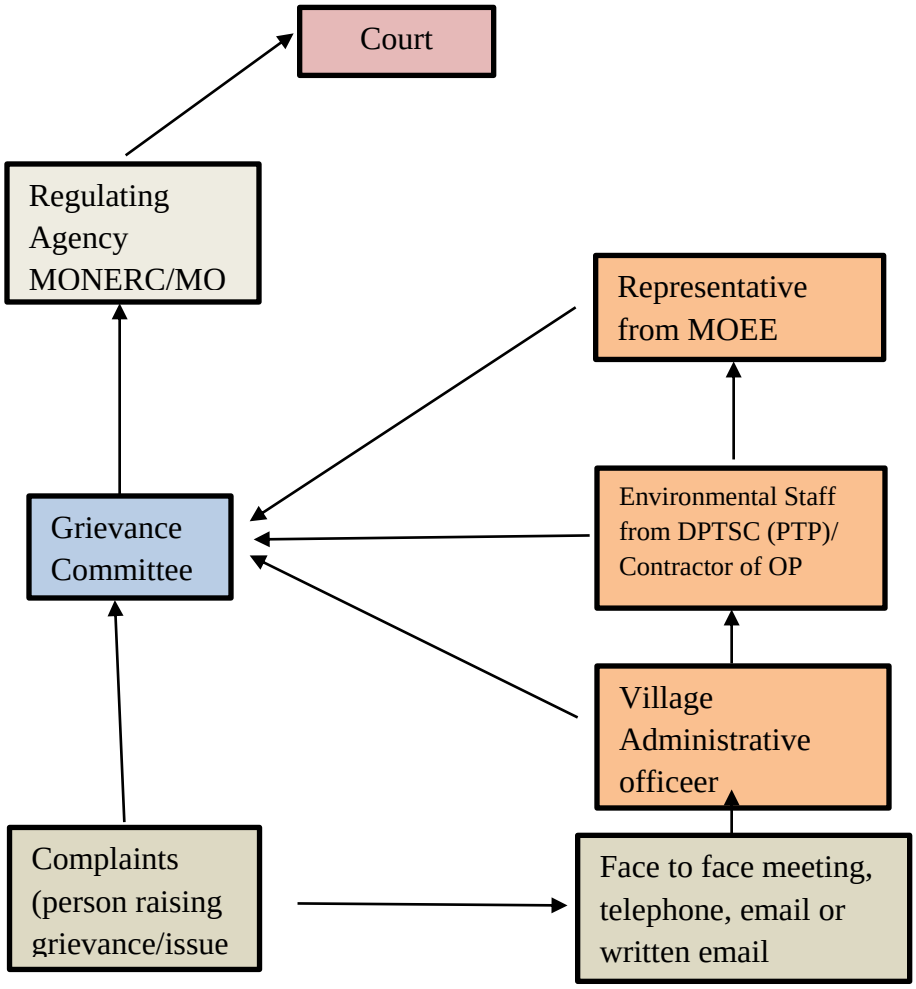
No.	Activity	Responsible Company	Frequency	Estimated Amount (% of Net Profit)
2.	Contribution to develop nursing home and philanthropic sector	Aung Myint Mo Co., Ltd.	Annually during construction phase	0.20%
3.	Contribution to develop orphanages and religious sector	Aung Myint Mo Co., Ltd.	Annually during construction phase	0.30%
4.	Contribution to Environmental Conservation sector	Aung Myint Mo Co., Ltd.	Annually during construction phase	1.00%
5.	Contribution to development of nearby communities	Aung Myint Mo Co., Ltd.	Annually during construction phase	0.20%
Total				**2.00%**

8.3.5 Grievance Redress Mechanism

Grievance Redress Mechanism for construction phase



Grievance Redress Mechanism for operation phase


Court
Regulating Agency MONERC/MO
Representative from MOEE
Grievance Committee
Environmental Staff from DPTSC (PTP)/ Contractor of OP
Village Administrative officeer
Complaints (person raising grievance/issue
Face to face meeting, telephone, email or written email

CHAPTER IX: CONCLUSION AND RECOMMENDATIONS

9.1 Conclusion

The proposed project is meant for the construction of 230 KV (Tarkaw Bridge to Mongpying) and (Mong Pyin to Keng Teng) power transmission line 74.4 Miles (Section – 2) and this Initial Environmental Examination (IEE) has been formulated to implement for AUNG MYINT MO Co., Ltd. under the Environmental Conservation Laws (2012). The study team for preparation of IEE is E Guard Environmental Services.

Environmental qualities such as air and noise had measured with EPAS and Digital Sound Level Meter at some villages located near transmission line of the proposed project site for 24 hours continuously. These air and noise are within the ranges of guidelines. And then, samples of surface water had collected according to the procedures and tested in the well-known laboratories. According to the results of laboratories compared with guidelines and standards, the water parameters are within the ranges.

The potential impacts are assessed and mitigation measures are also identified for two phases (construction & operation). The potential common impacts are habitat loss for flora & fauna, landslides, contamination and sedimentation of water and soil, visual amenity, noise, vibration, dust emissions and deforestation and land conflicts. Moreover, the required plans such as EMP, EMOP, emergency plan and CSR plan are also drawn up for construction of power transmission line operated by AUNG MYINT MO Co., Ltd.

The key informant interview and household socio-economic survey were carried out at the nearest villages along the route line. According to local perspectives around the project areas, most of the local people have positive impacts on this project because this creates many job opportunities, local development (transportation, facilitation and education) which can improve their living standards. But, they want to reduce the speed of trucks, especially when passing through the village and also to cover crop compensation for their seasonal crops.

In this IEE report, Environmental Management Plan (EMP) covering the anticipated impacts, mitigation measures, management and monitoring plans during all phases are provided. Besides EMP, the project proponent for the sake of employees and local community should also perform Corporate Social Responsibility (CSR) plan. AUNG MYINT MO Co., Ltd. should accomplish these plans and should review EMP regularly to cover all potential impacts, amendments and modifications during construction phase.

9.2 Recommendations

According to the study conducted, AUNG MYINT MO Co., Ltd. will have the least impacts through successful implementation of Environmental Management Plan, Monitoring Plan, Emergency Response Plan and Corporate Social Responsibility Plan as mentioned in this report. The following recommendations are made for effective and efficient implementing of construction of power transmission line activities, environmental conservation and health and safety activities during construction phase.

- To conduct the environmental qualities such as air, noise, vibration and water in line with the monitoring plan according to the schedule;
- To control the speed and trips of dump trucks per day, to spray water onto the ground regularly and to transport the construction materials with covers in dump trucks for dust control;
- To sow seeds or graft of the indigenous and fast-growing tree species, and to re-vegetate in all forest areas for landscape and amenity;
- To abide by Environmental Policy, Laws, Rules and Regulations of the Republic of the Union of Myanmar;
- To follow the instructions, provide Personal Protective Equipment, assess the health conditions of workers and their families, provide adequate living facilities and give holidays in terms of safety and health measures;
- To accurately implement Environmental Management Plan, Monitoring Plan, Emergency Plan and Corporate Social Responsibility Plan;
- To keep full records of environmental management activities properly and present to independent third party environmental audit;
- To modify the plans according to the feedbacks obtained and lessons learned from the monitoring the present process.

9.3 Cost estimation for EMP

The Following table shows the expenditures for the implementation of Environmental Management Plan. It can change according to the situation.

Table 9. 1: Environmental Management Plan Cost Estimation

Item	Unit	Quantity	Unit Cost	Cost (MMK)
Mitigation Measure				
Dust Control	day	360	20,000	7,200,000
Sign for safety	LS	1		2,000,000
Domestic waste control and others mitigation measure		360	20,000	7,200,000
Sub-total				**17,600,000**
Monitoring Program				
Water Quality	year	2	220,000	440,000
Sub-total				**1,240,000**
Environmental Supervision and Advisors				
Staff to implement EMP	m/m	12	350,000	4,200,000
Capacity Development and Training		3	900,000	2,700,000
Sub-total				**6,900,000**
Contingency				2,000,000
Grand Total				**25,940,000**

Appendix I: Commitment Letter (Project Proponent)

AUNG MYINT MO CO., LTD.

No. 212, East Circular Road, Min Ga Lar Oo Quarter, Taunggyi, Myanmar .
Phone: 95-081-2123852, Fax: 95-081-2123852 . Email: zawzawoo.amm@gmail.com

Our Reference: AMM/337-270917/MT

Date:27.09.2017

Subject: **To follow Commitments and Mitigation Measures stated in the Environmental Management Plan of Initial Environmental Examination Report (IEE)**

With regard to the above matter, we, Aung Myint Mo Co., Ltd. strongly commits that IEE report for our project is strong and complete, we obeyed Rules and Regulations including EIA procedure in preparing IEE report and we will follow our commitments, mitigation measures and EMP which are mentioned in the IEE report for our proposed project.

Yours Respectfully,

AUNG MYINT MO CO.,LTD. No..... Date.....

Zaw Zaw Oo
Managing Director
Aung Myint Mo Co.,Ltd.

AUNG MYINT MO CO., LTD.

No. 212, East Circular Road, Min Ga Lar Oo Quarter, Taunggyi, Myanmar .
Phone: 95-081-2123852, Fax: 95-081-2123852 . Email: zawzawoo.amm@gmail.com

Our Reference: AMM/337-270917/MT

Date:27.09.2017

Subject: **To follow Commitments and Mitigation Measures stated in the Environmental Management Plan of Initial Environmental Examination Report (IEE)**

With regard to the above matter, we, Aung Myint Mo Co., Ltd. strongly commits that IEE report for our project is strong and complete, we obeyed Rules and Regulations including EIA procedure in preparing IEE report and we will follow our commitments, mitigation measures and EMP which are mentioned in the IEE report for our proposed project.

Yours Respectfully,

AUNG MYINT MO CO.,LTD. No..... Date.....

Nyi Lin Thein
General Manager
Aung Myint Mo Co.,Ltd.

AUNG MYINT MO CO., LTD.

No. 212, East Circular Road, Min Ga Lar Oo Quarter, Taunggyi, Myanmar .
Phone: 95-081-2123852, Fax: 95-081-2123852 . Email: zawzawoo.amm@gmail.com

Our Reference: AMM/337-270917/MT

Date:27.09.2017

Subject: **To follow Commitments and Mitigation Measures stated in the Environmental Management Plan of Initial Environmental Examination Report (IEE)**

With regard to the above matter, we, Aung Myint Mo Co., Ltd. strongly commits that IEE report for our project is strong and complete, we obeyed Rules and Regulations including EIA procedure in preparing IEE report and we will follow our commitments, mitigation measures and EMP which are mentioned in the IEE report for our proposed project.

Yours Respectfully,

AUNG MYINT MO CO.,LTD. No..... Date.....

MIN THU
MANAGER
AUNG MYINT MO CO.,LTD.

Appendix II: Commitment Letter (Third Party)

No. (11), Airport Avenue Road, (လေဆိပ်ရိပ်သာလမ်း)
Yangon Airport Road, Saw Bwar Gyi Gone Quarter,
Insein Township, Yangon 11011, Myanmar.
Tel: (95) 1 666512 Fax: (95) 19667757
H.P (95) 9 44801676

ISO 9001:2015 Certificate No. 19IQCX27
IAS ACCREDITED Management Systems Certification Body MSCB-119

Commitment to follow and compliance with Environmental Conservation Law, Rules, Environmental Impact Assessment Procedure, National Environmental (Quality) Emission Guidelines, Standards and Mitigation Measures Stated in the Initial Environmental Examination (IEE) report

With regard to the above matter, we, E Guard Environmental Services Co., Ltd has prepared Initial Environmental Examination (IEE) for construction of 230 KV power transmission line (Section – II) by Aung Myint Mo Co., Ltd. which success tender for the construction of 230 KV from Ministry of Electricity and Energy (MOEE). Our company strongly commits that this proposed IEE report for this project is strong and complete, and prepared by following Environmental Conservation Law (2012), Environmental Conservation Rules (2014), Environmental Impact Assessment Procedure (2015), National Environmental (Quality) Emission Guidelines (2015), WHO standards IFC guidelines for Electric Power Transmission and Distribution (2007), IFC Environmental, Health and Safety (EHS) Guidelines (2007), IFC Guidelines on Waste Management Facilities (2007) and relevant environmental standards through successful implementation of mitigation measures and monitoring plan stated in the Initial Environmental Examination (IEE) Report.

Tin Aung Moe
Director
E guard Environmental Services

Appendix III: Company Exporter/ Importer Registration

13473

The Government of the Republic of the Union of Myanmar
Ministry of Commerce
Department of Trade

CERTIFICATE OF EXPORTER/IMPORTER REGISTRATION

1. Enterprise Name (မြန်မာ/အင်္ဂလိပ်): Aung Myint Mo Co.,Ltd.
2. Registration No: 20981(10-08-07)
3. Registration Term: FIVE YEAR
4. Start Date : 12-01-2014
5. End Date : 11-07-2018
6. Address : (မြန်မာ/အင်္ဂလိပ်) No-17, Ground Floor, Baya Thokdi Street, Kyar Kwat Thit Quarter, Tamwe T/S, Yangon Region,Myanmar
7. Business Registration No : 139/2007-2008(12-7-2007)
8. Type of Business : (မြန်မာ/အင်္ဂလိပ်)
   - ☐ Sole Proprietorship(တစ်ဦးတည်းပိုင်)
   - ☐ Partnership(အစုစပ်)
   - ☒ Limited Company(လီမိတက်ကုမ္ပဏီ)(Myanmar/Foreign)
   - ☐ Co-operative Society(သမဝါယမအသင်း)
   - ☐ Others(Please specify) [illegible]
9. Type of Service : ○ New ○ Extension ☒ Amendment
10. Contact No :

Telephone No.	Fax No.	e-mail
095014493 095107117 95-9-5198612 95-9-2024109	951-551936	amm.director@gmail.com

11. Remarks :
No.18, Dama Seinta Road, Kyauk Myaunge Quarter, Tarmway T/S,

12. Terms and Conditions : စည်းကမ်းချက်များ
I hereby register the above mentioned enterprise as Exporter/Importer subject to the following terms and conditions: [illegible]
(a) Line of goods permitted - all items except prohibited and restricted items.
[illegible]
(b) The enterprise must abide by the Export/Import rules and Regulations prescribed for the registered Exporters/Importers. [illegible]

Stamp
17-1-2018

For Director General
စိုးနိုင်၊ လက်ထောက်ညွှန်ကြားရေးမှူး

EIREGEX12130012

Appendix IV: Company Registration

သက်တမ်းတိုး

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ 000388
အစီအဆောင်စီမံကိန်းနှင့် စီးပွားရေးဖွံ့ဖြိုးတိုးတက်မှုဝန်ကြီးဌာန

ကုမ္ပဏီမှတ်ပုံတင်လက်မှတ်

အမှတ် .....၁၃၉..../ ၂၀၀၇-၂၀၀၈

မြန်မာနိုင်ငံ ကုမ္ပဏီများ အက်ဥပဒေအရ .....အောင်မြင့်မိုရ် ကုမ္ပဏီ လီမိတက်.....
.....အား ပေးရန်တာဝန် ကန့်သတ်ထားသော လီမိတက်
ကုမ္ပဏီအဖြစ် ၂၀၀၇. နှစ်၊ ....ဇူလိုင်....လ၊ .၁၂.. ရက်နေ့တွင် မှတ်ပုံတင်ထားခြင်းအား
၂၀၁၃. နှစ်၊ ....သြဂုတ်.လ၊ .၂၈.. ရက်နေ့မှစ၍ သက်တမ်းတိုး ခွင့်ပြုလိုက်သည်။

ညွှန်ကြားရေးမှူးချုပ် (ကိုယ်စား)
(နန်းရီရီသန်း ၊ ညွှန်ကြားရေးမှူး)
ရင်းနှီးမြှုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF NATIONAL PLANNING AND ECONOMIC DEVELOPMENT

CERTIFICATE OF INCORPORATION

NO. .....139..... of 2007-2008

I hereby certify that the tenure of ...AUNG MYINT MO
COMPANY LIMITED .....incorporated under the
Myanmar Companies Act on .....12th JULY, 2007.....
is renewed with effected from .....28th AUGUST, 2013.....

For Director General
(Nang Yi Yi Than, Director)
Directorate of Investment and Company Administration

Appendix V: Form VI

008881

FORM VI

RETURN OF ALLOTMENTS
THE MYANMAR COMPANIES ACT.

(See Section 104)

(To be filed with the Registrar within one month after the allotment is made)

Return of allotment from the made on 5th day of July, 200 2013
on the of 200 of the *

Made pursuant to Section 104 (1)

Number of the shares allotted payable in cash ..... AUNG MYINT MO COMPANY LIMITED.
" " " " .....

Nominal amount of the shares so allotted ..... 5,010 Shares
" " " " ..... Ks. 50,100,000/-

Amount paid or due and payable on cash such share ..... Kyats. 10,000/-
" " " " ..... (Fully Paid Up)

Number of ordinary shares allotted for a consideration other than cash

Nominal amount to be ordinary shares so allotted ..... NIL

Amount to be treated as paid on each such share ..... NIL

The consideration for which such share have been allotted is as follow : -

---

NOTE In making a return of allotments under Section 104 (1) the Myanmar Companies Act., it is to be noted that -

1. When a return include several allotments made on different dates, the actual date of only the first and last of such allotment should be entered at the tip of the front page, and the registration of the return should be effected within one month of the first date.
2. When a return relates to one allotment only, made on one particular date, that date only should be inserted and the spaces for the second date struck out and the world made substituted for the world "From" after the world "allotments" above.

Here insert name of Company.

Distinguish between preference, ordinary, or other description of shares.

ORM VI

Appendix VI: Tree Inventory at MoneZin Protected Public Forest

၅/၁၉၉၆ စီးပွားရေး ပိတောက်စိုက်ခင်း (၁၁၁) ဧက မိုးဇင်းကြိုးဝိုင်း [illegible] ၂၃၀ ကေဗွီ ဓာတ်အားလိုင်း လမ်းကြောင်းတစ်လျှောက် တိုင်းတာ ကောက်ယူသည့် အပင်စာရင်း

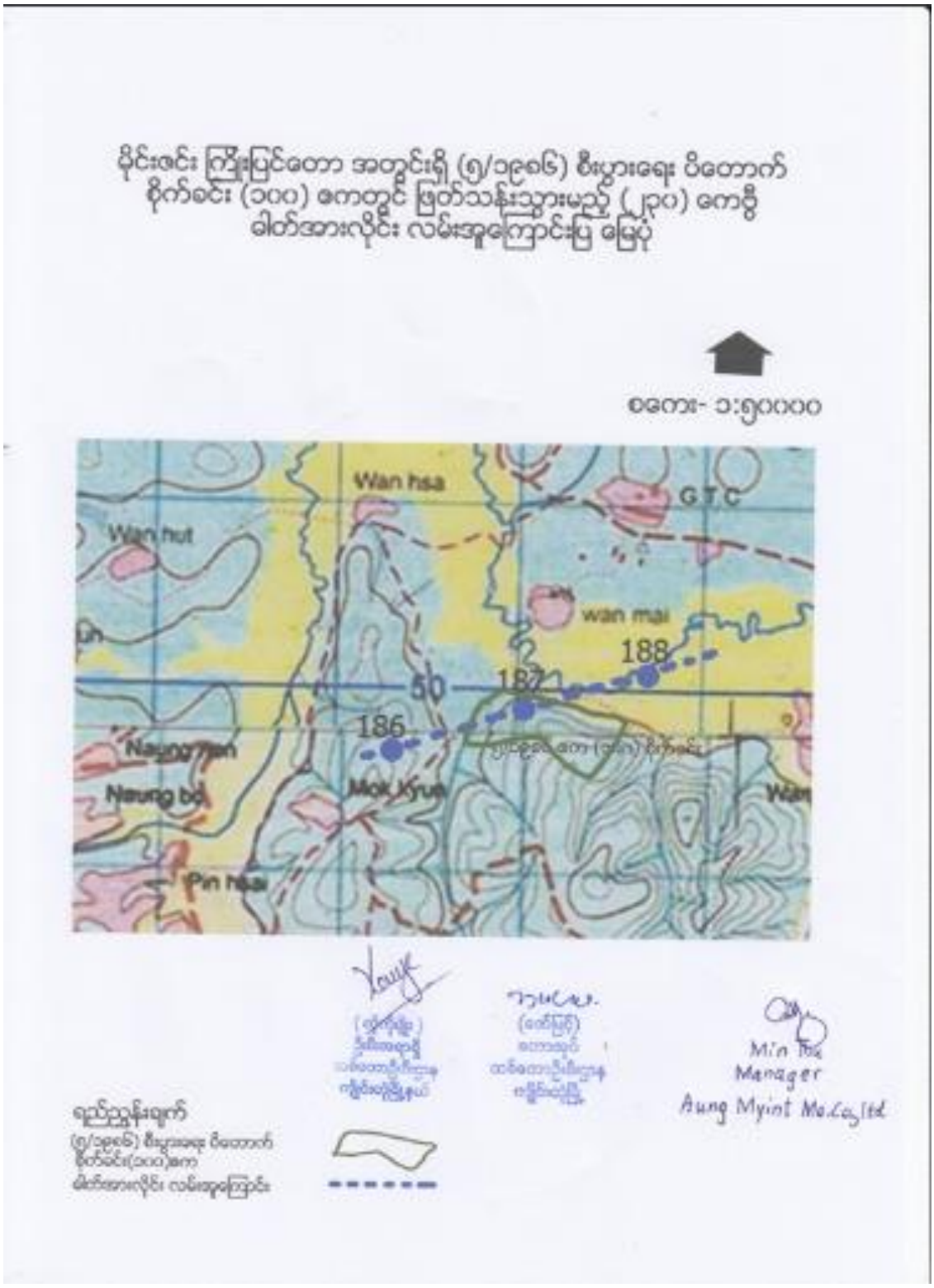
စဉ်	သစ်မျိုး	ရင်စို လုံးပတ် အတန်းအစားနှင့် အပင်အရေအတွက်						
		၁'၀" မှ ၁'၅"	၁'၆" မှ ၁'၁၁"	၂'၀" မှ ၂'၅"	၂'၆" မှ ၂'၁၁"	၃'၀" မှ ၃'၅"	၃'၆" မှ ၃'၁၁"	စုစုပေါင်း
၁။	စီးပွားရေး ပိတောက်	၇၂	၂၄၈	၂၆၆	၁၁၄	၆၂	၇	၇၆၉
	စုစုပေါင်း							၇၆၉

[illegible]
ဦးစီးအရာရှိ

[illegible]
တောအုပ်

ဗိုလ်အောင်နိုင်
ဦးစီးအရာရှိ (စက်/လျှပ်)

မင်းသူ
မန်နေဂျာ


မိုင်းဇင်း ကြိုးပြင်တော အတွင်းရှိ (၅/၁၉၈၆) စီးပွားရေး ပိတောက်
စိုက်ခင်း (၁၀၀) ကောတွင် ဖြတ်သန်းသွားမည့် (၂၃၀) ကေဗွီ
ဓါတ်အားလိုင်း လမ်းအကြောင်းပြ မြေပုံ
စကေး- ၁:၅၀၀၀၀
Wan hsa
G.T.C
Wan hut
wan mai
188
187
50
186
Mok Kyue
Pin hsa
Min Tha
Manager
Aung Myint Mo Co.,Ltd
ရည်ညွှန်းချက်
(၅/၁၉၈၆) စီးပွားရေး ပိတောက်
စိုက်ခင်း(၁၀၀)နှင့
ဓါတ်အားလိုင်း လမ်းအကြောင်း

မိုင်းဇင်း ကြိုးပြင်တော (၅/၁၉၆၆) စီးပွားရေး ဝိတောက်စိုက်ခင်း (၁၀၁) ဧက အတွင်း ၂၃၀ ကေဗွီ ဓာတ်အားလိုင်း ဖြတ်သန်းသွားသည့် လမ်းအကြောင်းပြ မြေပုံ

Mie Thu
Manager
Aung Myint Mo. Co., ltd.

သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံမြို့နယ် ၅/၁၉၈၆ စီးပွားရေး ပိတောက်စိုက်ခင်း (၁၀၀) ဧက
မိုင်းခင်းကြိုးဝိုင်းတော အတွင်း၊ ၂၃၀ ကေဗွီ (နမ့်စန် - မိုင်းယန်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း အပိုင်း ၂
(တာခေါ်တံတား - မိုင်းယန်းမြို့) မှ (မိုင်းယန်းမြို့ - ကျိုင်းတုံမြို့) အထိ ဖြတ်သန်းတည်ဆောက်မည့်
လမ်းကြောင်းအား ကွင်းဆင်းစစ်ဆေးခြင်း မှတ်တမ်းဓာတ်ပုံများ

(တော်မှန်)
တောအုပ်
သစ်တောဦးစီးဌာန
ကျိုင်းတုံမြို့

Min Thu
Manager
Aung Myint Mo Co., Ltd.

Appendix VII: Tree Inventory at PanKyuu Protected Public Forest

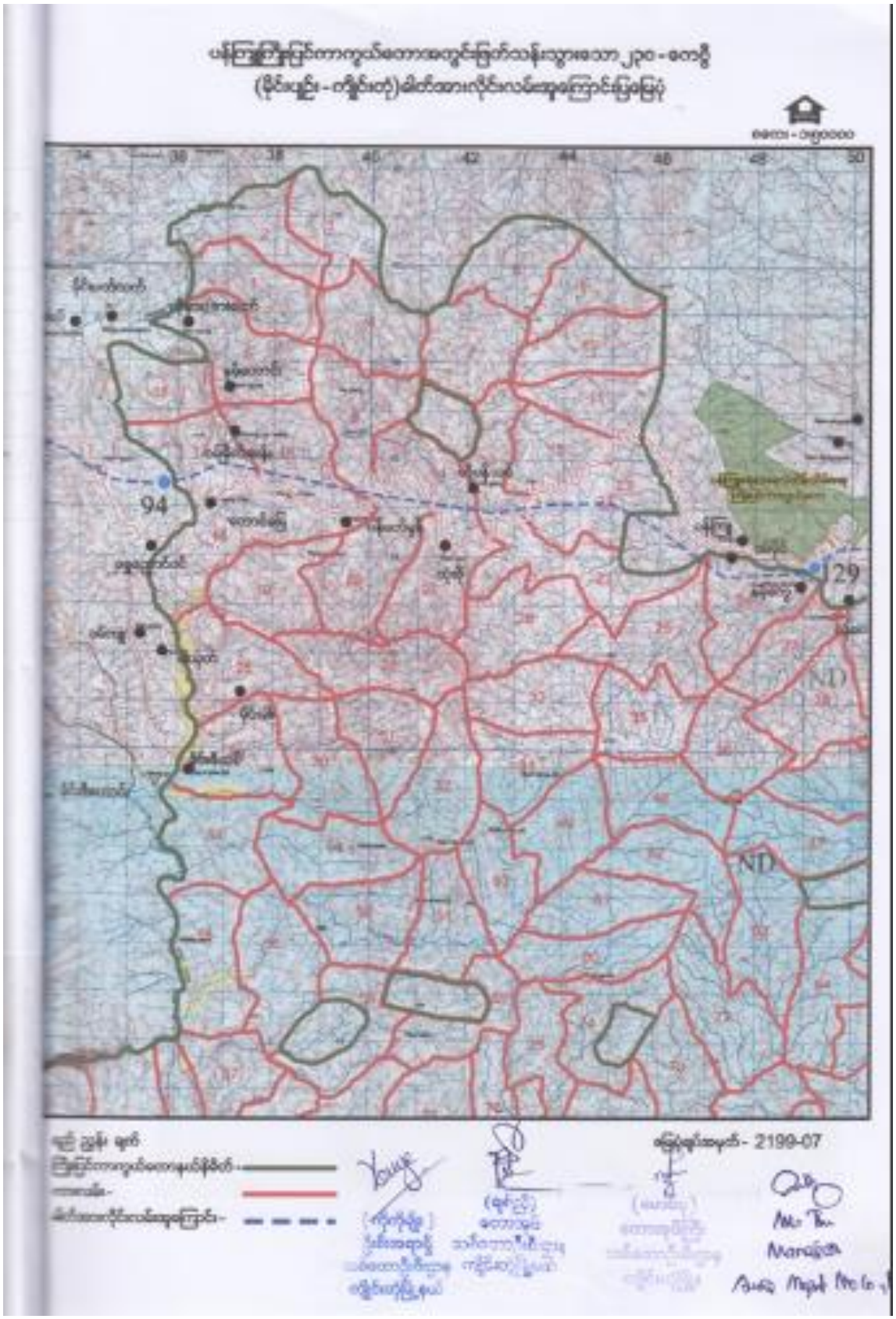
ပန်ကြူးကြိုးဝိုင်းကာကွယ်တောအတွင်း ၂၃၀ ကေဗွီ ဓာတ်အားလိုင်း ဖြတ်သန်းမည့် လမ်းကြောင်းတစ်လျှောက်
တိုင်းတာ ကောက်ယူသည့် အပင်စာရင်း

စဉ်	သစ်မျိုး	ရင်စို လုံးပတ် အတန်းအစားနှင့် အပင်အရေအတွက်						
		၆" မှ ၁၀"	၁'၀" မှ ၁'၁၀"	၂'၀" မှ ၂'၁၀"	၃'၀" မှ ၃'၁၀"	၄'၀" မှ ၄'၁၀"	၅'၀" မှ ၅'၁၀"	စုစုပေါင်း
၁။	ထင်းရှူး	၂၆၀	၇၂	၃၉	၁၂	-	-	၃၈၃
၂။	သစ်ခယ်	၄၉၆၇	၄၉၉၅	၉၂၀	၁၂၅	-	-	၁၁၀၀၇
၃။	ဓလောက်ယား	၃၀၀၆	၃၀၃၇	၆၉၄	၉၆	-	-	၆၈၃၃
၄။	သစ်ရ	၅၂၁၀	၃၇၆၀	၈၆၇	၈၂	၁၁	-	၉၉၃၀
၅။	အခြား	၈၀၇၄	၅၂၄၀	၂၇၀၆	၃၀၄	၆၉	-	၁၆၃၉၃
	စုစုပေါင်း	၂၁၅၁၇	၁၇၁၀၄	၅၂၂၆	၆၁၉	၈၀	-	၄၄၅၄၆

Moe Thu Aung
Surveyor
Aung Myint Mo Co., Ltd

Manager
Aung Myint Mo Co., Ltd

Proposed by Aung Myint Mo Co., Ltd.
(IEE)




ပန်းကြူး ကြီးပြင် ကာကွယ်တောအတွင်း ၂၃၀ ကေတို့ ဓာတ်အားလိုင်းဖြတ်သန်းသွားသည့်
လမ်းအကြောင်းပြ မြေပုံ
Kiulong
Google earth

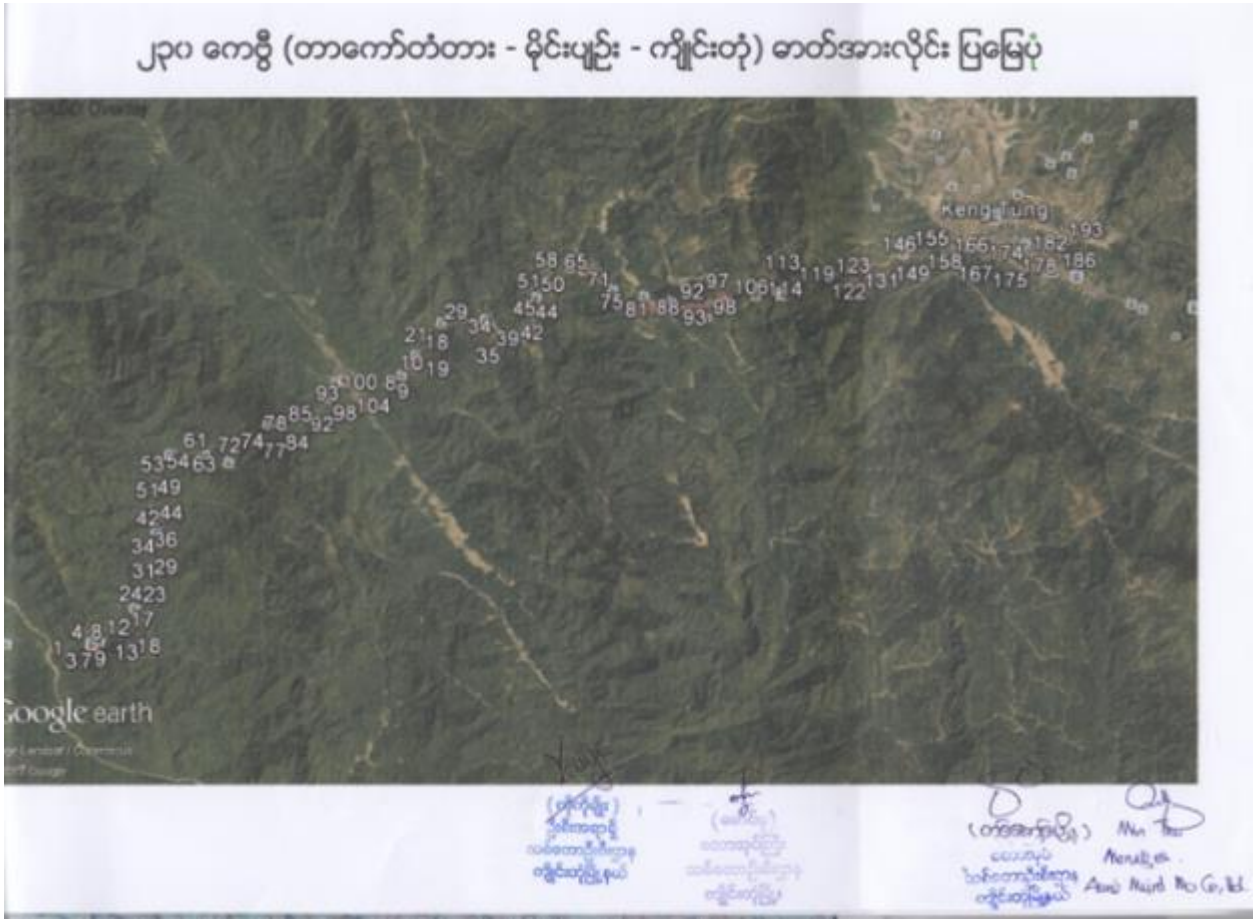
သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံမြို့နယ် ပန်ကြူကျိုးမြင့်ကာကွယ်တောအတွင်း
၂၃၀ ကေဗွီ (နမ့်ဆန် - မိုင်းပျဉ်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း အပိုင်း ၂ (တာကော်ဝတ်တား - မိုင်းပျဉ်းမြို့) မှ
(မိုင်းပျဉ်းမြို့ - ကျိုင်းတုံမြို့) အထိ ဖြတ်သန်းတည်ဆောက်မည့် လမ်းကြောင်းအား ကွင်းဆင်း စစ်ဆေးခြင်း
မှတ်တမ်းဓာတ်ပုံများ

Appendix VIII: Tree Inventory at Naung Cho Protected Public Forest

နောင်ချိုကြိုမြင်ကာတွယ်တောအတွင်း ၂၃၀ ကေဗွီ ဓာတ်အားလိုင်း ဖြတ်သန်းမည့် လမ်းကြောင်းတစ်လျှောက်
တိုင်းတာ တောက်ယူသည့် အပင်စာရင်း

စဉ်	သစ်မျိုး	ရင်စို လုံးပတ် အတန်းအစားနှင့် အပင်အရေအတွက်						
		၆" မှ ၁၀"	၁'၀" မှ ၁'၁၀"	၂'၀" မှ ၂'၁၀"	၃'၀" မှ ၃'၁၀"	၄'၀" မှ ၄'၁၀"	၅'၀" မှ ၅'၁၀"	စုစုပေါင်း
၁။	ထင်းရှူး	၁၈၄	၂၃၀	၁၈၄	၂၂	-	-	၆၂၀
၂။	သစ်အယ်	၄၆၀	၃၄၅	၉၆	၄၆	-	-	၉၄၇
၃။	သစ်ရှ	၄၈၃	၂၇၆	၁၆၀	၆၉	-	-	၉၈၈
၄။	အင်ကြင်း	၂၃၀	၂၅၃	၄၆		-	-	၅၂၉
၅။	အခြား	၁၃၈၀	၉၂၀	၈၀၅	၉၂	-	-	၃၁၉၇
	စုစုပေါင်း	၂၇၃၇	၂၀၂၄	၁၂၉၁	၂၃၀	-	-	၆၂၈၃

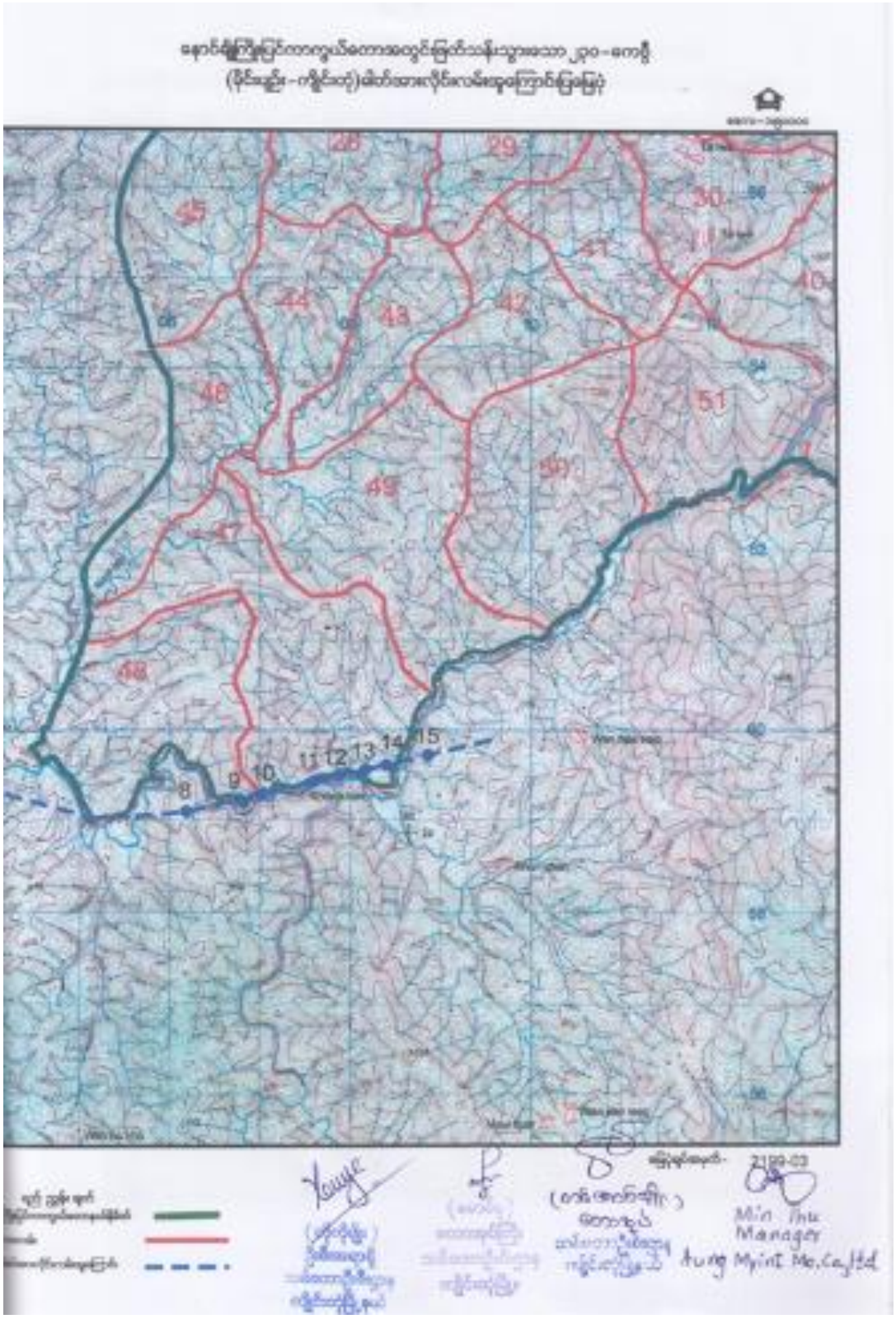
Moe Thu Aung
Surveyor
Aung Myint Mo Co. ltd


ကုဝ ကေဒို (တာကော်တံတား - မိုင်းယူး - ကျိုင်းတုံ) ဓာတ်အားလိုင်း ပြမြေပုံ
Google earth


၂၃၀ ကေဗွီ (မိုင်းပျဉ်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း ပြမြေပုံ
Kang Tung
Mongping
Google earth


နောင်ချိုကြီးပြင်ကာကွယ်တောအတွင်း ၂၃၀ ကေဗို့ဓာတ်အားလိုင်းဖြတ်သန်းသွားသည့်
လမ်းအကြောင်းပြ မြေပုံ
S-CADD Overlay
Mongping
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
192
Google earth

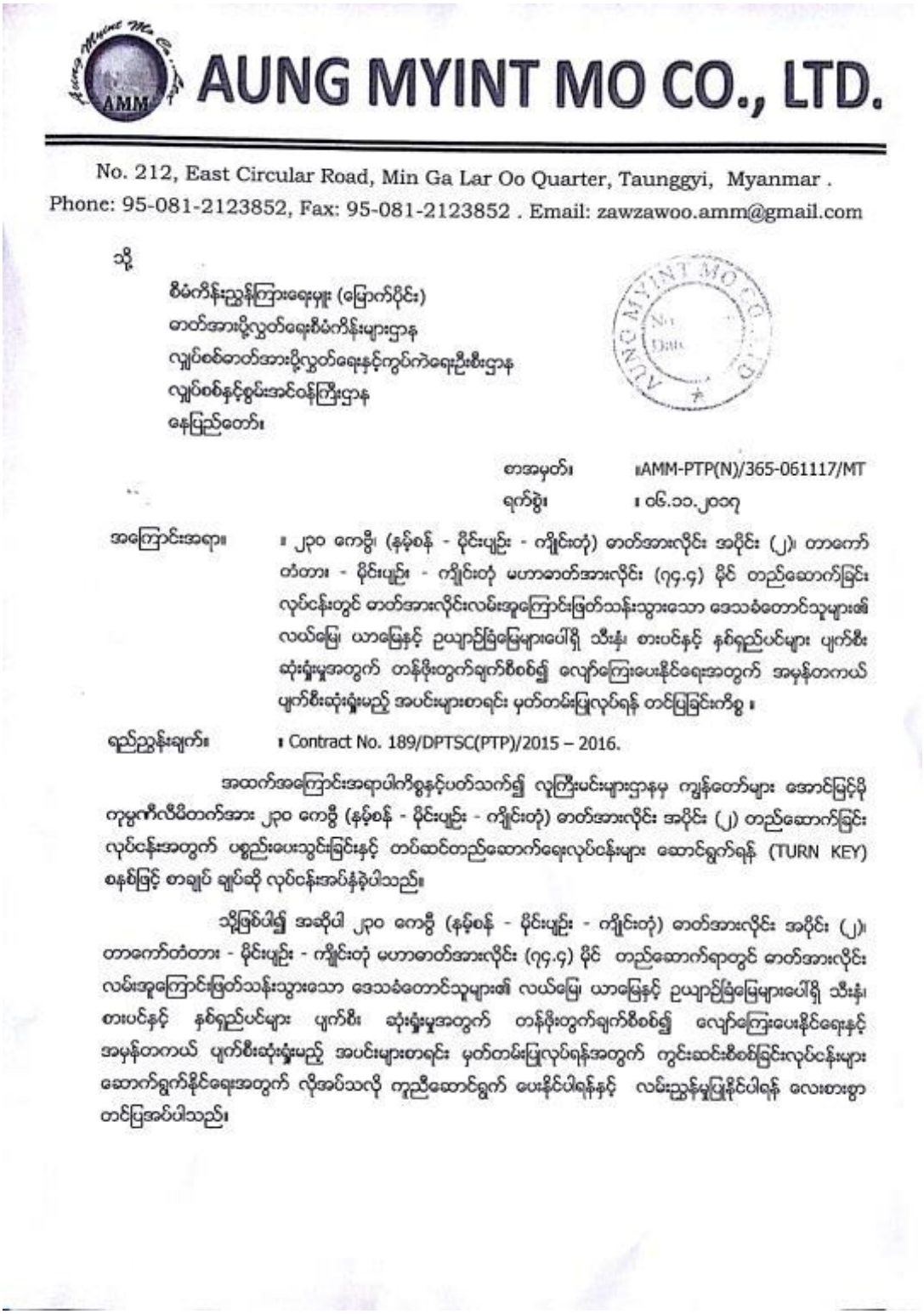
Proposed by Aung Myint Mo Co., Ltd.
(IEE)



သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံမြို့နယ် နောင်မိုးကျိုးမြိုင်ကာကွယ်တောအတွင်း
၂၃၀ ကေဗွီ (နမ့်ဆမ် - မိုင်းယန်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း အပိုင်း ၂ (တာခေါ်တံတား - မိုင်းယန်းမြို့) မှ
(မိုင်းယန်းမြို့ - ကျိုင်းတုံမြို့) အထိ ဖြတ်သန်းတည်ဆောက်မည့် လမ်းကြောင်းအား ကွင်းဆင်း စစ်ဆေးခြင်း
မှတ်တမ်းဓာတ်ပုံများ

Min Thu
Manager
Aung Myint Mo Co.,Ltd

Appendix IX: Institutions for Crop compensation team



AUNG MYINT MO CO., LTD.

No. 212, East Circular Road, Min Ga Lar Oo Quarter, Taunggyi, Myanmar .
Phone: 95-081-2123852, Fax: 95-081-2123852 . Email: zawzawoo.amm@gmail.com

သို့

စိမ်ကိန်းညွှန်ကြားရေးမှူး (ပြောက်ဝိုင်း)
တတ်အားပို့လွှတ်ရေးစီမံကိန်းများဌာန
လျှပ်စစ်ဓာတ်အားပို့လွှတ်ရေးနှင့်ကွပ်ကဲရေးဦးစီးဌာန
လျှပ်စစ်နှင့်စွမ်းအင်ဝန်ကြီးဌာန
နေပြည်တော်။

စာအမှတ်။ ။AMM-PTP(N)/365-061117/MT
ရက်စွဲ။ ။ ၀၆.၁၁.၂၀၁၇

အကြောင်းအရာ။ ။ ၂၃၀ ကေဗွီ (နမ့်စန် - မိုင်းပျဉ်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း အဝိုင်း (၂)၊ တာကော်တံတား - မိုင်းပျဉ်း - ကျိုင်းတုံ မဟာဓာတ်အားလိုင်း (၇၄.၄) မိုင် တည်ဆောက်ခြင်းလုပ်ငန်းတွင် ဓာတ်အားလိုင်းလမ်းအကြောင်းဖြတ်သန်းသွားသော ဒေသခံတောင်သူများ၏ လယ်မြေ၊ ယာမြေနှင့် ဥယျာဉ်ခြံမြေများပေါ်ရှိ သီးနှံ၊ စားပင်နှင့် နှစ်ရှည်ပင်များ ပျက်စီးဆုံးရှုံးမှုအတွက် တန်ဖိုးတွက်ချက်စီစစ်၍ လျော်ကြေးပေးနိုင်ရေးအတွက် အမှန်တကယ် ပျက်စီးဆုံးရှုံးမည့် အပင်များစာရင်း မှတ်တမ်းပြုလုပ်ရန် တင်ပြခြင်းကိစ္စ ။

ရည်ညွှန်းချက်။ ။ Contract No. 189/DPTSC(PTP)/2015 – 2016.

အထက်အကြောင်းအရာပါကိစ္စနှင့်ပတ်သက်၍ လူကြီးမင်းများဌာနမှ ကျွန်တော်များ အောင်မြင့်မိ ကုမ္ပဏီလီမိတက်အား ၂၃၀ ကေဗွီ (နမ့်စန် - မိုင်းပျဉ်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း အဝိုင်း (၂) တည်ဆောက်ခြင်းလုပ်ငန်းအတွက် ပစ္စည်းပေးသွင်းခြင်းနှင့် တပ်ဆင်တည်ဆောက်ရေးလုပ်ငန်းများ ဆောင်ရွက်ရန် (TURN KEY) စနစ်ဖြင့် စာချုပ် ချုပ်ဆို လုပ်ငန်းအပ်နှံခဲ့ပါသည်။

သို့ဖြစ်ပါ၍ အဆိုပါ ၂၃၀ ကေဗွီ (နမ့်စန် - မိုင်းပျဉ်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း အဝိုင်း (၂)၊ တာကော်တံတား - မိုင်းပျဉ်း - ကျိုင်းတုံ မဟာဓာတ်အားလိုင်း (၇၄.၄) မိုင် တည်ဆောက်ရာတွင် ဓာတ်အားလိုင်းလမ်းအကြောင်းဖြတ်သန်းသွားသော ဒေသခံတောင်သူများ၏ လယ်မြေ၊ ယာမြေနှင့် ဥယျာဉ်ခြံမြေများပေါ်ရှိ သီးနှံ၊ စားပင်နှင့် နှစ်ရှည်ပင်များ ပျက်စီး ဆုံးရှုံးမှုအတွက် တန်ဖိုးတွက်ချက်စီစစ်၍ လျော်ကြေးပေးနိုင်ရေးနှင့် အမှန်တကယ် ပျက်စီးဆုံးရှုံးမည့် အပင်များစာရင်း မှတ်တမ်းပြုလုပ်ရန်အတွက် ကွင်းဆင်းစီစစ်ခြင်းလုပ်ငန်းများ ဆောက်ရွက်နိုင်ရေးအတွက် လိုအပ်သလို ကူညီဆောင်ရွက် ပေးနိုင်ပါရန်နှင့် လမ်းညွှန်မှုပြုနိုင်ပါရန် လေးစားစွာ တင်ပြအပ်ပါသည်။

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~ အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ မိုင်းပျဉ်းမြို့နယ်၊ မိုင်းပျဉ်းမြို့၏ ဖွဲ့စည်းတာဝန်ပေးအပ်ခြင်း

~ အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ ကျိုင်းတုံမြို့နယ်၊ ကျိုင်းတုံမြို့၏ ဖွဲ့စည်းတာဝန်ပေးအပ်ခြင်း

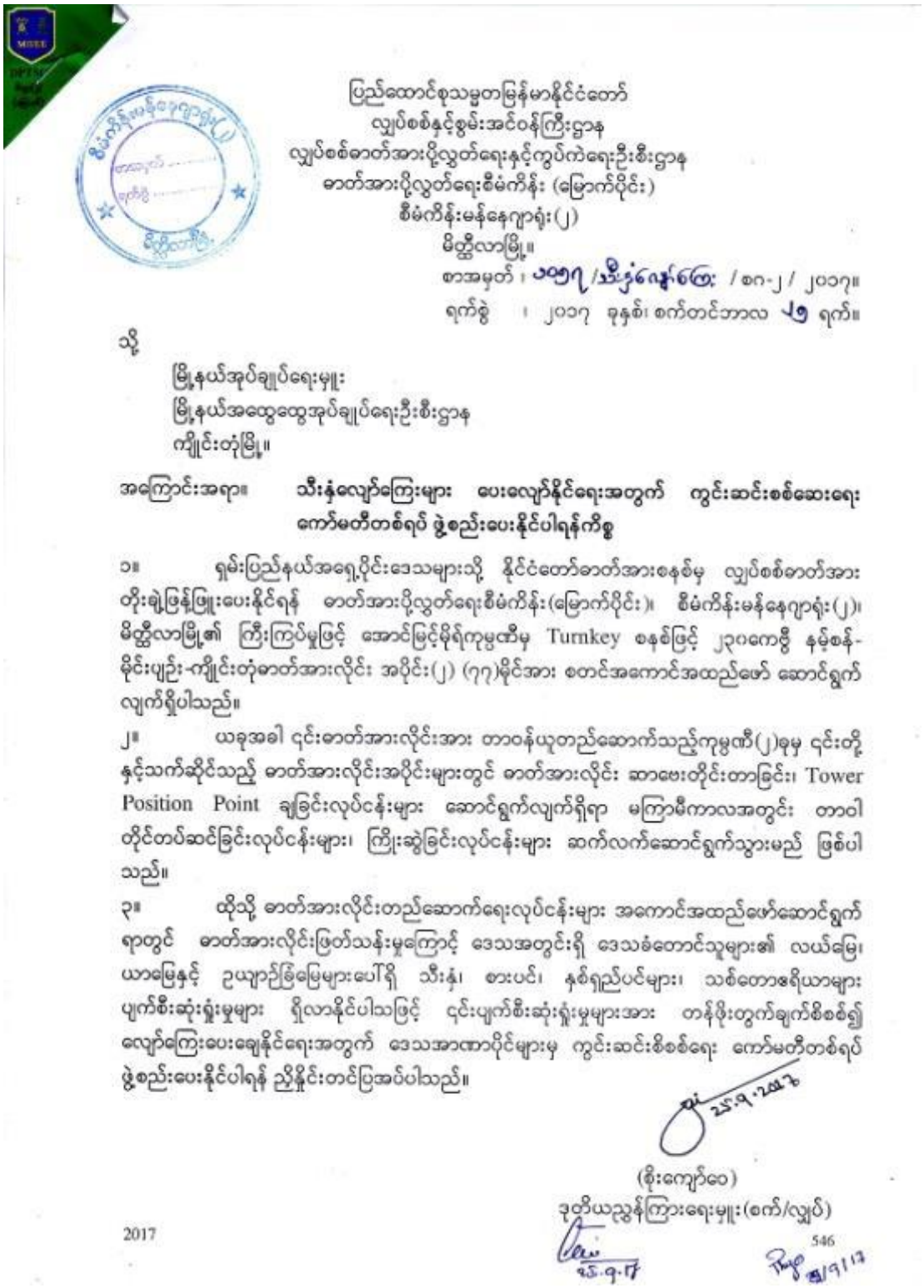
လေးစားစွာဖြင့်

AUNG MYINT MO CO.,LTD
No............
Date..........

(ပုံ) Nyi Lin Thein
General Manager
Aung Myint Mo Co.,Ltd.

မိတ္တူကို/-

- ညွှန်ကြားရေးမှူးချုပ်၊ လျှပ်စစ်ဓာတ်အားပို့လွှတ်ရေးနှင့်ကွပ်ကဲရေးဦးစီးဌာန
- ဒုတိယ ညွှန်ကြားရေးမှူးချုပ်၊ လျှပ်စစ်ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်းများဌာန
- ညွှန်ကြားရေးမှူး(ဒီဇိုင်း)၊ လျှပ်စစ်ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်းများဌာန
- ညွှန်ကြားရေးမှူး(လုပ်ငန်း)၊ လျှပ်စစ်ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်းများဌာန
- စီမံကိန်းမန်နေဂျာ(၂)၊ မြောက်ပိုင်း၊ လျှပ်စစ်ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်းများဌာန၊ မိတ္ထီလာမြို့။
- ရုံးလက်ခံ



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
လျှပ်စစ်နှင့်စွမ်းအင်ဝန်ကြီးဌာန
လျှပ်စစ်ဓာတ်အားပို့လွှတ်ရေးနှင့်ကွပ်ကဲရေးဦးစီးဌာန
ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်း (မြောက်ပိုင်း)
စီမံကိန်းမန်နေဂျာရုံး(၂)
မိတ္ထီလာမြို့။
စာအမှတ် ။ ၁၀၅၇/သီးနှံလျော်ကြေး/စဂ-၂/ ၂၀၁၇။
ရက်စွဲ ။ ၂၀၁၇ ခုနှစ်၊ စက်တင်ဘာလ ၂၅ ရက်။

သို့
မြို့နယ်အုပ်ချုပ်ရေးမှူး
မြို့နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန
ကျိုင်းတုံမြို့။

အကြောင်းအရာ။ **သီးနှံလျော်ကြေးများ ပေးလျော်နိုင်ရေးအတွက် ကွင်းဆင်းစစ်ဆေးရေး ကော်မတီတစ်ရပ် ဖွဲ့စည်းပေးနိုင်ပါရန်ကိစ္စ**

၁။ ရှမ်းပြည်နယ်အရှေ့ပိုင်းဒေသများသို့ နိုင်ငံတော်ဓာတ်အားစနစ်မှ လျှပ်စစ်ဓာတ်အား တိုးချဲ့ဖြန့်ဖြူးပေးနိုင်ရန် ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်း(မြောက်ပိုင်း)၊ စီမံကိန်းမန်နေဂျာရုံး(၂)၊ မိတ္ထီလာမြို့၏ ကြီးကြပ်မှုဖြင့် အောင်မြင့်မိုရ်ကုမ္ပဏီမှ Turnkey စနစ်ဖြင့် ၂၃၀ကေဗွီ နမ့်စန်-မိုင်းဖျဉ်း-ကျိုင်းတုံဓာတ်အားလိုင်း အပိုင်း(၂) (၇၇)မိုင်အား စတင်အကောင်အထည်ဖော် ဆောင်ရွက်လျက်ရှိပါသည်။

၂။ ယခုအခါ ၎င်းဓာတ်အားလိုင်းအား တာဝန်ယူတည်ဆောက်သည့်ကုမ္ပဏီ(၂)ခုမှ ၎င်းတို့နှင့်သက်ဆိုင်သည့် ဓာတ်အားလိုင်းအပိုင်းများတွင် ဓာတ်အားလိုင်း ဆာဗေးတိုင်းတာခြင်း၊ Tower Position Point ချခြင်းလုပ်ငန်းများ ဆောင်ရွက်လျက်ရှိရာ မကြာမီကာလအတွင်း တာဝါတိုင်တပ်ဆင်ခြင်းလုပ်ငန်းများ၊ ကြိုးဆွဲခြင်းလုပ်ငန်းများ ဆက်လက်ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။

၃။ ထိုသို့ ဓာတ်အားလိုင်းတည်ဆောက်ရေးလုပ်ငန်းများ အကောင်အထည်ဖော်ဆောင်ရွက်ရာတွင် ဓာတ်အားလိုင်းဖြတ်သန်းမှုကြောင့် ဒေသအတွင်းရှိ ဒေသခံတောင်သူများ၏ လယ်မြေ၊ ယာမြေနှင့် ဥယျာဉ်စိုက်မြေများပေါ်ရှိ သီးနှံ၊ စားပင်၊ နှစ်ရှည်ပင်များ၊ သစ်တောဇရိယာများ ပျက်စီးဆုံးရှုံးမှုများ ရှိလာနိုင်ပါသဖြင့် ၎င်းပျက်စီးဆုံးရှုံးမှုများအား တန်ဖိုးတွက်ချက်စိစစ်၍ လျော်ကြေးပေးချေနိုင်ရေးအတွက် ဒေသအာဏာပိုင်များမှ ကွင်းဆင်းစိစစ်ရေး ကော်မတီတစ်ရပ် ဖွဲ့စည်းပေးနိုင်ပါရန် ညှိနှိုင်းတင်ပြအပ်ပါသည်။

25.9.2017

(စိုးကျော်ဝေ)
ဒုတိယညွှန်ကြားရေးမှူး(စက်/လျှပ်)

2017

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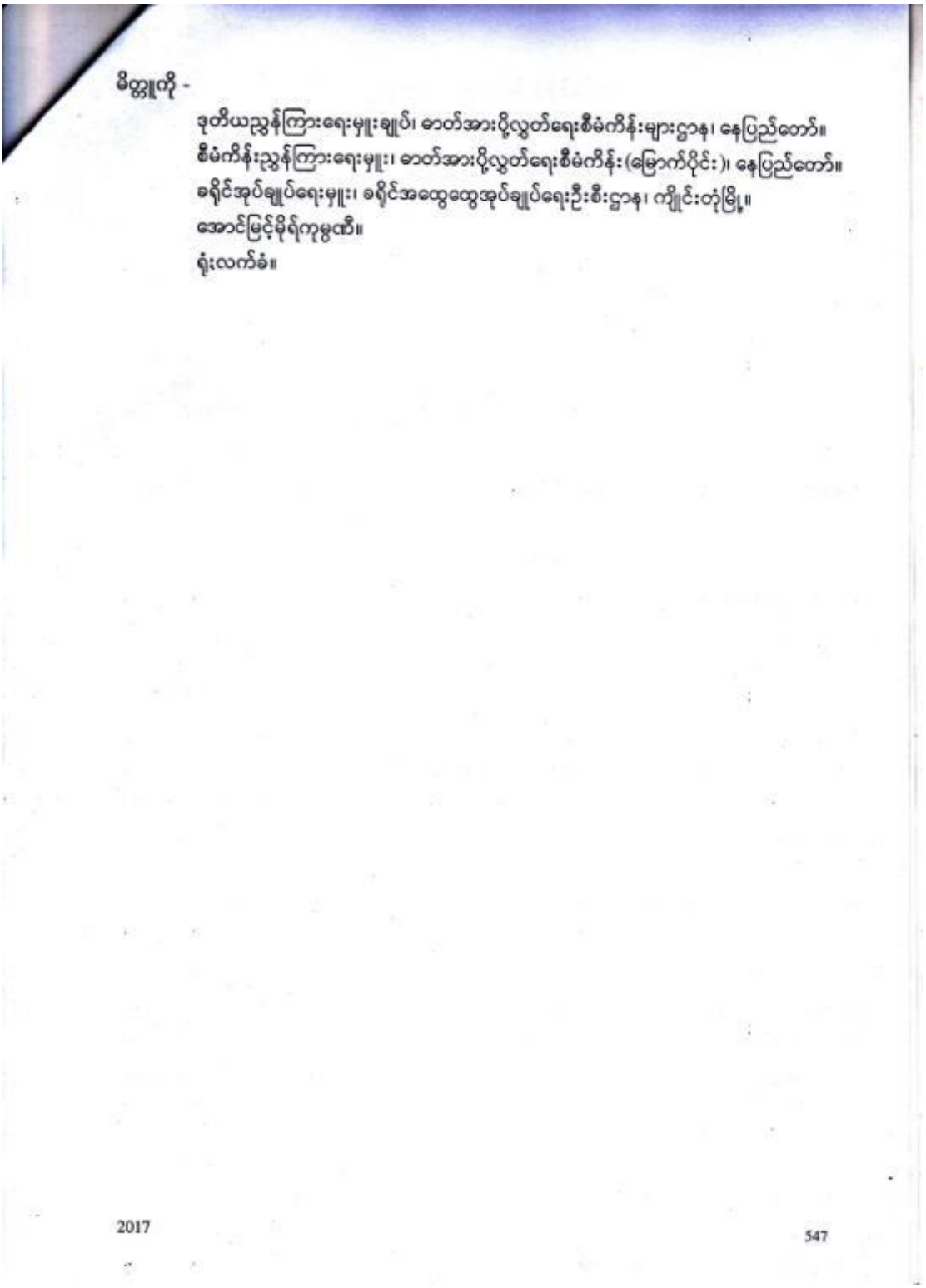
25.9.17



မိတ္တူကို -

ဒုတိယညွှန်ကြားရေးမှူးချုပ်၊ ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်းများဌာန၊ နေပြည်တော်။
စီမံကိန်းညွှန်ကြားရေးမှူး၊ ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်း (မြောက်ပိုင်း)၊ နေပြည်တော်။
ခရိုင်အုပ်ချုပ်ရေးမှူး၊ ခရိုင်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ ကျိုင်းတုံမြို့။
အောင်မြင့်မိုရ်ကုမ္ပဏီ။
ရုံးလက်ခံ။

2017

547

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
လျှပ်စစ်နှင့်စွမ်းအင်ဝန်ကြီးဌာန
လျှပ်စစ်ဓာတ်အားပို့လွှတ်ရေးနှင့်ကွပ်ကဲရေးဦးစီးဌာန
ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်း (မြောက်ပိုင်း)
စီမံကိန်းမန်နေဂျာရုံး(၂)
မိတ္ထီလာမြို့။
စာအမှတ် ၊ ၁၀၆၀ /ဓါပို့နှံ့ကျော်ကြား / ၈ဂ-၂ / ၂၀၁၇။
ရက်စွဲ ၊ ၂၀၁၇ ခုနှစ်၊ စက်တင်ဘာလ ၂၅ ရက်။

သို့

မြို့နယ်အုပ်ချုပ်ရေးမှူး
မြို့နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန
မိုင်းပျဉ်းမြို့။

အကြောင်းအရာ။ **သီးနှံလျော်ကြေးများ ပေးလျော်နိုင်ရေးအတွက် ကွင်းဆင်းစစ်ဆေးရေး ကော်မတီတစ်ရပ် ဖွဲ့စည်းပေးနိုင်ပါရန်ကိစ္စ**

၁။ ရှမ်းပြည်နယ်အရှေ့ပိုင်းဒေသများသို့ နိုင်ငံတော်ဓာတ်အားစနစ်မှ လျှပ်စစ်ဓာတ်အား တိုးချဲ့ဖြန့်ဖြူးပေးနိုင်ရန် ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်း(မြောက်ပိုင်း)၊ စီမံကိန်းမန်နေဂျာရုံး(၂)၊ မိတ္ထီလာမြို့၏ ကြီးကြပ်မှုဖြင့် အောင်မြင့်မိုရ်ကုမ္ပဏီမှ Turnkey စနစ်ဖြင့် ၂၃၀ကေဗွီ နမ့်စန်-မိုင်းပျဉ်း-ကျိုင်းတုံဓာတ်အားလိုင်း အပိုင်း(၂) (၇၇)မိုင်အား စတင်အကောင်အထည်ဖော် ဆောင်ရွက်လျက်ရှိပါသည်။

၂။ ယခုအခါ ၎င်းဓာတ်အားလိုင်းအား တာဝန်ယူတည်ဆောက်သည့်ကုမ္ပဏီ(၂)ခုမှ ၎င်းတို့နှင့်သက်ဆိုင်သည့် ဓာတ်အားလိုင်းအပိုင်းများတွင် ဓာတ်အားလိုင်း ဆာဗေးတိုင်းတာခြင်း၊ Tower Position Point ချခြင်းလုပ်ငန်းများ ဆောင်ရွက်လျက်ရှိရာ မကြာမီကာလအတွင်း တာဝါတိုင်တပ်ဆင်ခြင်းလုပ်ငန်းများ၊ ကြိုးဆွဲခြင်းလုပ်ငန်းများ ဆက်လက်ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။

၃။ ထိုသို့ ဓာတ်အားလိုင်းတည်ဆောက်ရေးလုပ်ငန်းများ အကောင်အထည်ဖော်ဆောင်ရွက်ရာတွင် ဓာတ်အားလိုင်းဖြတ်သန်းမှုကြောင့် ဒေသအတွင်းရှိ ဒေသခံတောင်သူများ၏ လယ်မြေ၊ ယာမြေနှင့် ဥယျာဉ်ခြံမြေများပေါ်ရှိ သီးနှံ၊ စားပင်၊ နှစ်ရှည်ပင်များ၊ သစ်တောဧရိယာများ ပျက်စီးဆုံးရှုံးမှုများ ရှိလာနိုင်ပါသဖြင့် ၎င်းပျက်စီးဆုံးရှုံးမှုများအား တန်ဖိုးတွက်ချက်စိစစ်၍ လျော်ကြေးပေးချေနိုင်ရေးအတွက် ဒေသအာဏာပိုင်များမှ ကွင်းဆင်းစိစစ်ရေး ကော်မတီတစ်ရပ် ဖွဲ့စည်းပေးနိုင်ပါရန် ညှိနှိုင်းတင်ပြအပ်ပါသည်။

၂၅.၉.၂၀၁၇

(စိုးကျော်ဝေ)
ဒုတိယညွှန်ကြားရေးမှူး(စက်/လျှပ်)

2017

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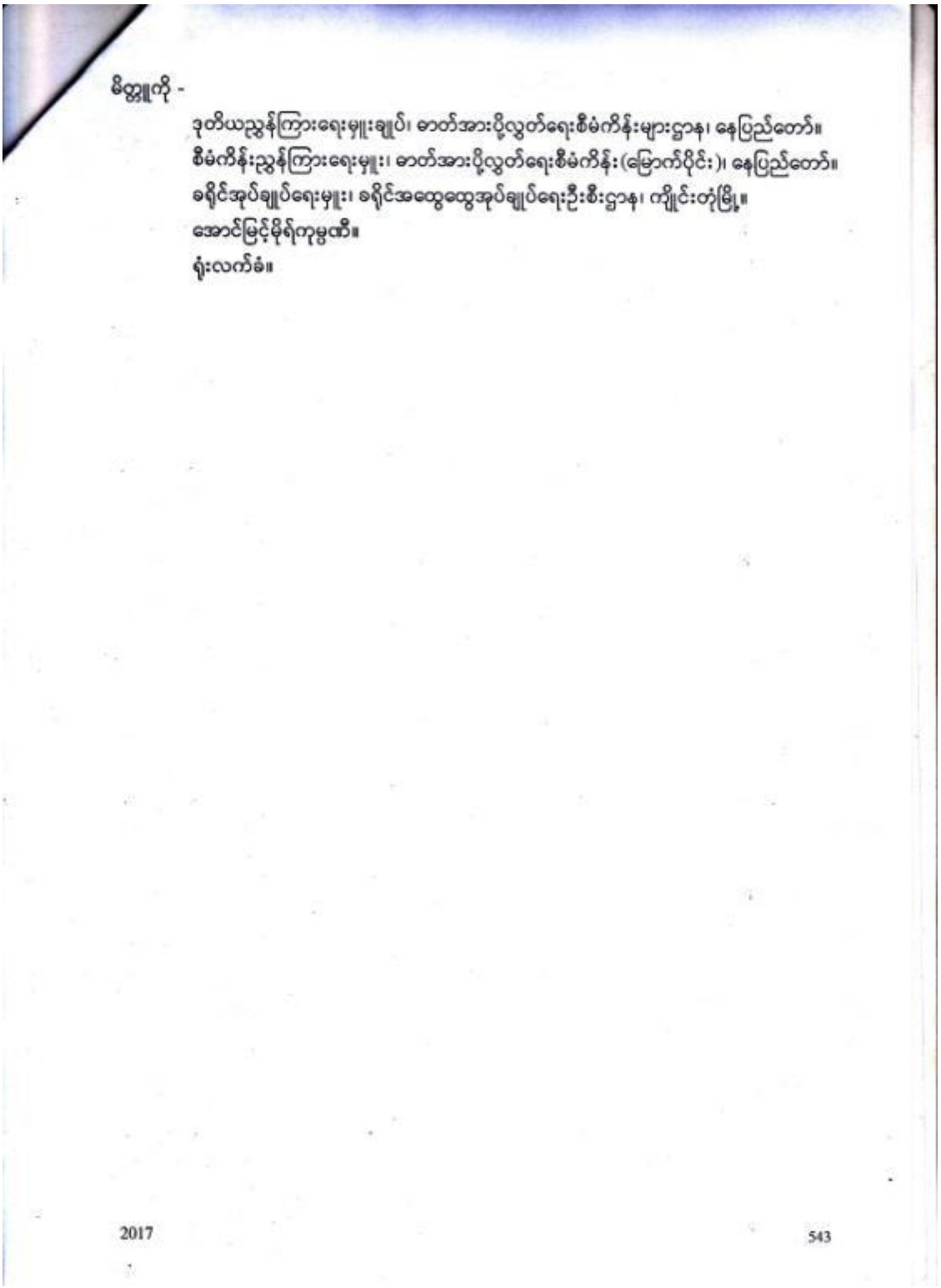


မိတ္တူကို -

ဒုတိယညွှန်ကြားရေးမှူးချုပ်၊ ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်းများဌာန၊ နေပြည်တော်။
စီမံကိန်းညွှန်ကြားရေးမှူး၊ ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်း (မြောက်ပိုင်း)၊ နေပြည်တော်။
ခရိုင်အုပ်ချုပ်ရေးမှူး၊ ခရိုင်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ ကျိုင်းတုံမြို့။
အောင်မြင့်မိုရ်ကုမ္ပဏီ။
ရုံးလက်ခံ။

2017

543

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
လျှပ်စစ်နှင့်စွမ်းအင်ဝန်ကြီးဌာန
လျှပ်စစ်ဓာတ်အားပို့လွှတ်ရေးနှင့်ကွပ်ကဲရေးဦးစီးဌာန
ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်း (မြောက်ပိုင်း)
စီမံကိန်းမန်နေဂျာရုံး(၂)
မိတ္ထီလာမြို့။

စာအမှတ် ၊ ၁၀၆၁ / [illegible] / စဂ-၂ / ၂၀၁၇။
ရက်စွဲ ၊ ၂၀၁၇ ခုနှစ်၊ စက်တင်ဘာလ ၂၅ ရက်။

သို့

မြို့နယ်အုပ်ချုပ်ရေးမှူး
မြို့နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန
တုံတာမြို့။

အကြောင်းအရာ။ **သီးနှံလျော်ကြေးများ ပေးလျော်နိုင်ရေးအတွက် ကွင်းဆင်းစစ်ဆေးရေး ကော်မတီတစ်ရပ် ဖွဲ့စည်းပေးနိုင်ပါရန်ကိစ္စ**

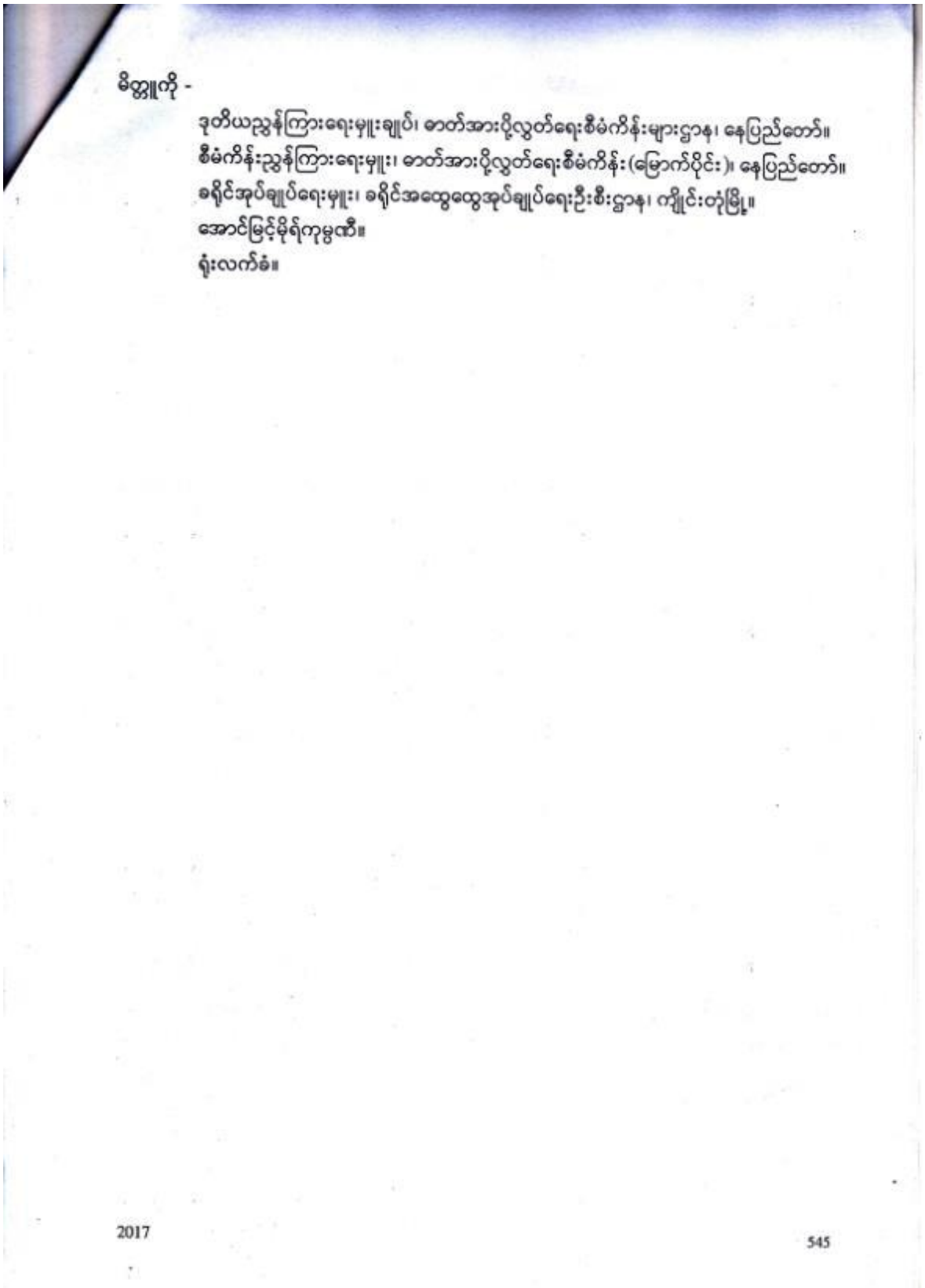
၁။ ရှမ်းပြည်နယ်အရှေ့ပိုင်းဒေသများသို့ နိုင်ငံတော်ဓာတ်အားစနစ်မှ လျှပ်စစ်ဓာတ်အား တိုးချဲ့ဖြန့်ဖြူးပေးနိုင်ရန် ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်း(မြောက်ပိုင်း)၊ စီမံကိန်းမန်နေဂျာရုံး(၂)၊ မိတ္ထီလာမြို့၏ ကြီးကြပ်မှုဖြင့် အောင်မြင့်မိုရ်ကုမ္ပဏီမှ Turnkey စနစ်ဖြင့် ၂၃၀ကေဗွီ နမ့်စန်-မိုင်းပျဉ်း-ကျိုင်းတုံဓာတ်အားလိုင်း အပိုင်း(၂) (၇၇)မိုင်အား စတင်အကောင်အထည်ဖော် ဆောင်ရွက်လျက်ရှိပါသည်။

၂။ ယခုအခါ ၎င်းဓာတ်အားလိုင်းအား တာဝန်ယူတည်ဆောက်သည့်ကုမ္ပဏီ(၂)ခုမှ ၎င်းတို့နှင့်သက်ဆိုင်သည့် ဓာတ်အားလိုင်းအပိုင်းများတွင် ဓာတ်အားလိုင်း ဆာဗေးတိုင်းတာခြင်း၊ Tower Position Point ချခြင်းလုပ်ငန်းများ ဆောင်ရွက်လျက်ရှိရာ မကြာမီကာလအတွင်း တာဝါတိုင်တပ်ဆင်ခြင်းလုပ်ငန်းများ၊ ကြိုးဆွဲခြင်းလုပ်ငန်းများ ဆက်လက်ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။

၃။ ထိုသို့ ဓာတ်အားလိုင်းတည်ဆောက်ရေးလုပ်ငန်းများ အကောင်အထည်ဖော်ဆောင်ရွက်ရာတွင် ဓာတ်အားလိုင်းဖြတ်သန်းမှုကြောင့် ဒေသအတွင်းရှိ ဒေသခံတောင်သူများ၏ လယ်မြေ၊ ယာမြေနှင့် ဥယျာဉ်ခြံမြေများပေါ်ရှိ သီးနှံ၊ စားပင်၊ နှစ်ရှည်ပင်များ၊ သစ်တောဧရိယာများ ပျက်စီးဆုံးရှုံးမှုများ ရှိလာနိုင်ပါသဖြင့် ၎င်းပျက်စီးဆုံးရှုံးမှုများအား တန်ဖိုးတွက်ချက်စိစစ်၍ လျော်ကြေးပေးချေနိုင်ရေးအတွက် ဒေသအာဏာပိုင်များမှ ကွင်းဆင်းစိစစ်ရေး ကော်မတီတစ်ရပ် ဖွဲ့စည်းပေးနိုင်ပါရန် ညှိနှိုင်းတင်ပြအပ်ပါသည်။

(စိုးကျော်ဝေ)
ဒုတိယညွှန်ကြားရေးမှူး(စက်/လျှပ်)

2017



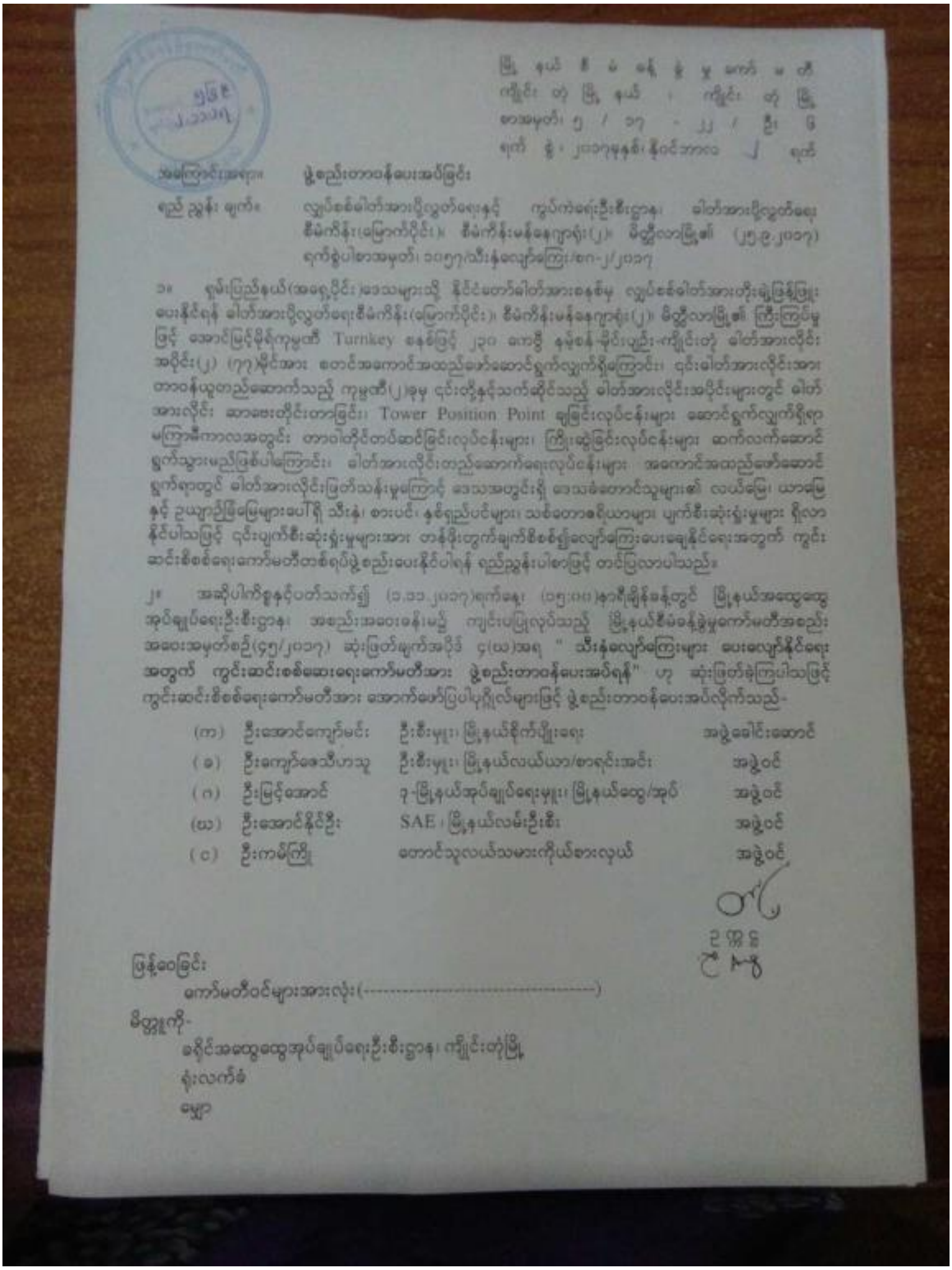
မိတ္တူကို -

ဒုတိယညွှန်ကြားရေးမှူးချုပ်၊ ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်းများဌာန၊ နေပြည်တော်။
စီမံကိန်းညွှန်ကြားရေးမှူး၊ ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်း (မြောက်ပိုင်း)၊ နေပြည်တော်။
ခရိုင်အုပ်ချုပ်ရေးမှူး၊ ခရိုင်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ ကျိုင်းတုံမြို့။
အောင်မြင့်မိုရ်ကုမ္ပဏီ။
ရုံးလက်ခံ။

2017

545

Proposed by Aung Myint Mo Co., Ltd.
(IEE)



မြို့နယ်စီမံခန့်ခွဲမှုကော်မတီ
ကျိုင်းတုံမြို့နယ် ၊ ကျိုင်းတုံမြို့
စာအမှတ်၊ ၅ / ၁၇ - ၂၂ / ဦး ၆
ရက်စွဲ၊ ၂၀၁၇ ခုနှစ်၊ နိုဝင်ဘာလ ၂ ရက်

အကြောင်းအရာ။ ဖွဲ့စည်းတာဝန်ပေးအပ်ခြင်း

ရည်ညွှန်းချက်။ လျှပ်စစ်ဓါတ်အားပို့လွှတ်ရေးနှင့် ကွပ်ကဲရေးဦးစီးဌာန၊ ဓါတ်အားပို့လွှတ်ရေး စီမံကိန်း(မြောက်ပိုင်း)၊ စီမံကိန်းမန်နေဂျာရုံး(၂)၊ မိတ္ထီလာမြို့၏ (၂၅.၉.၂၀၁၇) ရက်စွဲပါစာအမှတ်၊ ၁၀၅၇/သီးနှံလျော်ကြေး/စက-၂/၂၀၁၇

၁။ ရှမ်းပြည်နယ်(အရှေ့ပိုင်း)ဒေသများသို့ နိုင်ငံတော်ဓါတ်အားစနစ်မှ လျှပ်စစ်ဓါတ်အားတိုးချဲ့ဖြန့်ဖြူး ပေးနိုင်ရန် ဓါတ်အားပို့လွှတ်ရေးစီမံကိန်း(မြောက်ပိုင်း)၊ စီမံကိန်းမန်နေဂျာရုံး(၂)၊ မိတ္ထီလာမြို့၏ ကြီးကြပ်မှုဖြင့် အောင်မြင့်မိုရ်ကုမ္ပဏီ Turnkey စနစ်ဖြင့် ၂၃၀ ကေဗွီ နမ့်ဆန်-မိုင်းပျဉ်း-ကျိုင်းတုံ ဓါတ်အားလိုင်း အပိုင်း(၂) (၇၇)မိုင်အား စတင်အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိကြောင်း၊ ၎င်းဓါတ်အားလိုင်းအား တာဝန်ယူတည်ဆောက်သည့် ကုမ္ပဏီ(၂)ခုမှ ၎င်းတို့နှင့်သက်ဆိုင်သည့် ဓါတ်အားလိုင်းအပိုင်းများတွင် ဓါတ် အားလိုင်း ဆာဗေးတိုင်းတာခြင်း၊ Tower Position Point ချခြင်းလုပ်ငန်းများ ဆောင်ရွက်လျက်ရှိရာ မကြာမီကာလအတွင်း တာဝါတိုင်တပ်ဆင်ခြင်းလုပ်ငန်းများ၊ ကြိုးဆွဲခြင်းလုပ်ငန်းများ ဆက်လက်ဆောင် ရွက်သွားမည်ဖြစ်ပါကြောင်း၊ ဓါတ်အားလိုင်းတည်ဆောက်ရေးလုပ်ငန်းများ အကောင်အထည်ဖော်ဆောင် ရွက်ရာတွင် ဓါတ်အားလိုင်းဖြတ်သန်းမှုကြောင့် ဒေသအတွင်းရှိ ဒေသခံတောင်သူများ၏ လယ်မြေ၊ ယာမြေ နှင့် ဥယျာဉ်ခြံမြေများပေါ်ရှိ သီးနှံ၊ စားပင်၊ နှစ်ရှည်ပင်များ၊ သစ်တောစိုက်ခင်းများ၊ ပျက်စီးဆုံးရှုံးမှုများ ရှိလာ နိုင်ပါသဖြင့် ၎င်းပျက်စီးဆုံးရှုံးမှုများအား တန်ဖိုးတွက်ချက်စိစစ်၍လျော်ကြေးပေးချေနိုင်ရေးအတွက် ကွင်း ဆင်းစိစစ်ရေးကော်မတီတစ်ရပ်ဖွဲ့စည်းပေးနိုင်ပါရန် ရည်ညွှန်းပါစာဖြင့် တင်ပြလာပါသည်။

၂။ အဆိုပါကိစ္စနှင့်ပတ်သက်၍ (၁.၁၁.၂၀၁၇)ရက်နေ့ (၁၅:၀၀)နာရီအချိန်တွင် မြို့နယ်အထွေထွေ အုပ်ချုပ်ရေးဦးစီးဌာန၊ အစည်းအဝေးခန်းမ၌ ကျင်းပပြုလုပ်သည့် မြို့နယ်စီမံခန့်ခွဲမှုကော်မတီအစည်း အဝေးအမှတ်စဉ်(၄၅/၂၀၁၇) ဆုံးဖြတ်ချက်အပိုဒ် ၄(ဃ)အရ "**သီးနှံလျော်ကြေးများ ပေးလျော်နိုင်ရေး အတွက် ကွင်းဆင်းစစ်ဆေးရေးကော်မတီအား ဖွဲ့စည်းတာဝန်ပေးအပ်ရန်**" ဟု ဆုံးဖြတ်ခဲ့ကြပါသဖြင့် ကွင်းဆင်းစိစစ်ရေးကော်မတီအား အောက်ဖော်ပြပါပုဂ္ဂိုလ်များဖြင့် ဖွဲ့စည်းတာဝန်ပေးအပ်လိုက်သည်-

(က)	ဦးအောင်ကျော်မင်း	ဦးစီးမှူး၊ မြို့နယ်စိုက်ပျိုးရေး	အဖွဲ့ခေါင်းဆောင်
(ခ)	ဦးကျော်ဇေသီဟသူ	ဦးစီးမှူး၊ မြို့နယ်လယ်ယာ/စာရင်းအင်း	အဖွဲ့ဝင်
(ဂ)	ဦးမြင့်အောင်	ဒု-မြို့နယ်အုပ်ချုပ်ရေးမှူး၊ မြို့နယ်ထွေ/အုပ်	အဖွဲ့ဝင်
(ဃ)	ဦးအောင်နိုင်ဦး	SAE၊ မြို့နယ်လမ်းဦးစီး	အဖွဲ့ဝင်
(င)	ဦးကမ်ကြို	တောင်သူလယ်သမားကိုယ်စားလှယ်	အဖွဲ့ဝင်

ဥက္ကဋ္ဌ

ဖြန့်ဝေခြင်း
ကော်မတီဝင်များအားလုံး(------------------------------------)

မိတ္တူကို-
ခရိုင်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ ကျိုင်းတုံမြို့
ရုံးလက်ခံ
မျှော

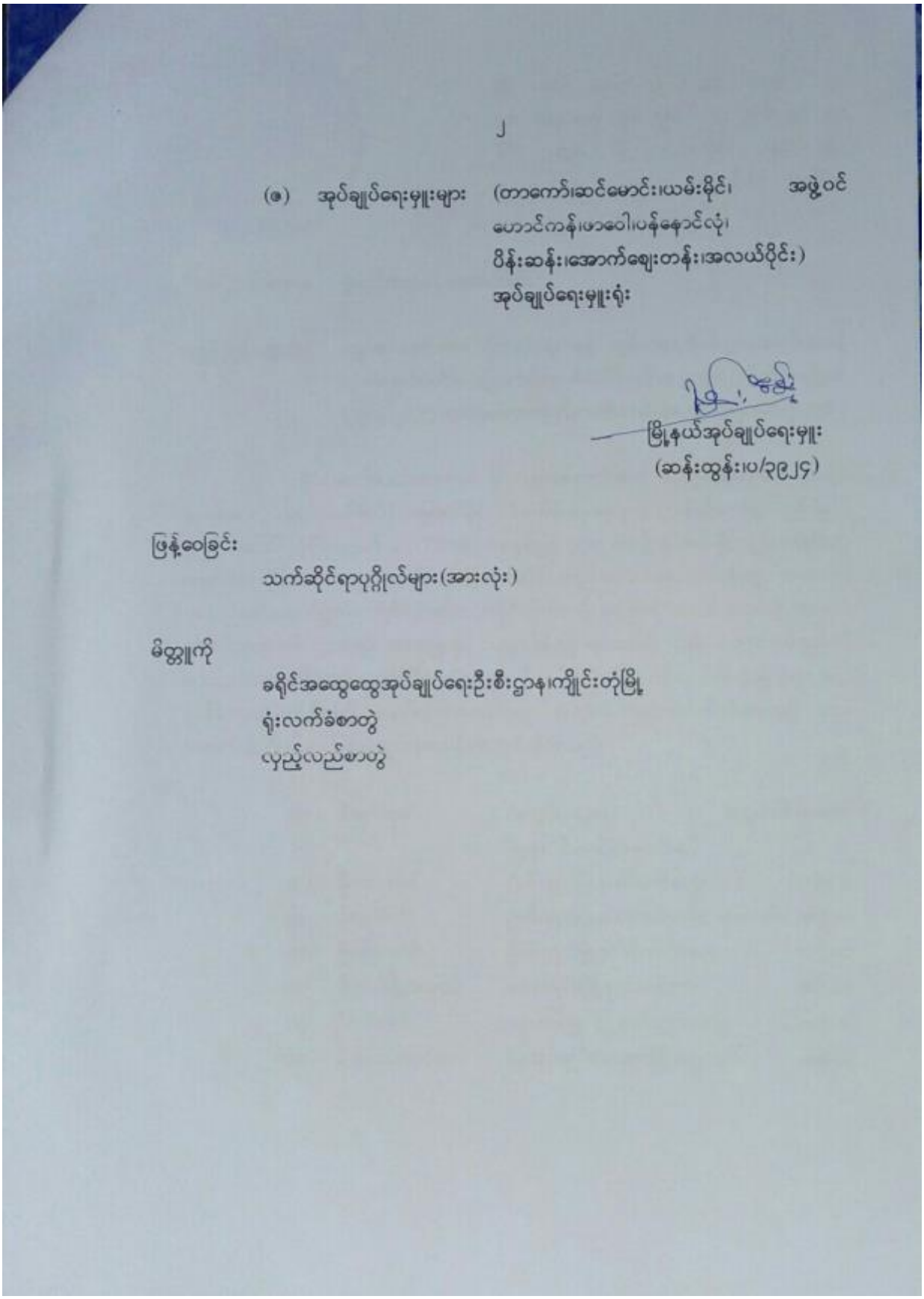
မြို့ နယ် အုပ် ချုပ် ရေး မှူး ရုံး
(အ ထွေ ထွေ အုပ် ချုပ် ရေး ဦး စီး ဌာ န)
မိုင်း ပျဉ်း မြို့ နယ်၊ မိုင်း ပျဉ်း မြို့
စာအမှတ်၊ ၅ / ၁၇ - ၁၀ / ဦး၆(၁၄၂၀)
ရက် စွဲ၊၂၀၁၇ ခုနှစ်၊ အောက်တိုဘာလ ၁၄ ရက်

အကြောင်းအရာ။ **ဖွဲ့စည်းတာဝန်ပေးအပ်ခြင်း**

ရည် ညွှန်း ချက်။ လျှပ်စစ်ဓာတ်အား ပို့လွှတ်ရေး နှင့် ကွပ်ကဲရေးဦးစီးဌာန၊ဓာတ်အားပို့လွှတ်ရေးစီမံကိန်း(မြောက်ပိုင်း) စီမံကိန်းမန်နေဂျာရုံး(၂)၊မိတ္ထီလာမြို့၏ (၂၅-၉-၂၀၁၇)ရက်စွဲပါစာအမှတ်၊ ၁၀၆၀/သီးနှံလျော်ကြေး/စဂ-၂/၂၀၁၇

နိုင်ငံတော်ဓာတ်အားစနစ် မှ လျှပ်စစ်ဓာတ်အား တိုးချဲ့ဖြန့်ဖြူးပေး နိုင်ရန် မာပင်အားပို့ လွှတ်ရေးစီမံကိန်း(မြောက်ပိုင်း) စီမံကိန်းမန်နေဂျာရုံး(၂)၊မိတ္ထီလာမြို့၏ကြီးကြပ်မှုဖြင့် အောင်မြင့်မိုရ်ကုမ္ပဏီ မှ Turnkey စနစ်ဖြင့် ၂၃၀ ကေဗွီ နမ့်စန်-မိုင်းပျဉ်း-ကျိုင်းတုံ ဓာတ်အားလိုင်းအပိုင်း (၂) (၇၇)မိုင် ဓာတ်အားလိုင်း တည်ဆောက်ရေးလုပ်ငန်းများ အကောင်အထည်ဖော်ဆောင်ရွက်ရာတွင် ဓာတ်အားလိုင်းဖြတ်သန်းမှုကြောင့် ဒေသအတွင်းရှိ ဒေသခံတောင်သူများ၏ လယ်မြေ၊ ယာမြေ နှင့် ဥယျာဉ်ခြံမြေ များပေါ်ရှိ သီးနှံ၊ စားပင်၊နှစ်ရှည်ပင်များ၊သစ်တောဧရိယာများ ပျက်စီးဆုံးရှုံးမှုများ ရှိလာနိုင်ပါသဖြင့် ၎င်းပျက်စီးဆုံးရှုံးမှုများအား တန်ဖိုးတွက်ချက်စိစစ်၍ လျော်ကြေးပေးနိုင်ရေး အတွက် ကွင်းဆင်းစိစစ်ရေးအဖွဲ့ အား အောက်ပါပုဂ္ဂိုလ်များဖြင့် ဖွဲ့စည်းတာဝန်ပေးအပ်လိုက်သည်-

(က)	ဦးဝင်းဖေ	အတွင်းရေးမှူး မြို့နယ်စီမံခန့်ခွဲမှုကော်မတီ	အဖွဲ့ခေါင်းဆောင်
(ခ)	ဦးသက်နိုင်	ဦးစီးမှူး၊မြို့နယ်စီမံကိန်းရုံး	အဖွဲ့ဝင်
(ဂ)	ဦးမင်းမင်း	ဦးစီးမှူး၊မြို့နယ်လယ်ယာစာရင်းအင်း	အဖွဲ့ဝင်
(ဃ)	ဦးမျိုးထက်	ဦးစီးမှူး၊မြို့နယ်စိုက်ပျိုးရေး	အဖွဲ့ဝင်
(င)	ဦးတင်မျိုးအောင်	တောအုပ်၊မြို့နယ်သစ်တော	အဖွဲ့ဝင်
(စ)	ဦးခင်ဇော်	လျှပ်စစ်မှူး၊မြို့နယ်လျှပ်စစ်ရုံး	အဖွဲ့ဝင်
(ဆ)	ဦးစိုင်းအောင်ဆမ်	မြို့အုပ်ချုပ်ရေးမှူး၊မြို့ထွေ/အုပ်	အဖွဲ့ဝင်



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(၈) အုပ်ချုပ်ရေးမှူးများ (တာကော်၊ဆင်မောင်း၊ယမ်းမိုင်၊ အဖွဲ့ဝင်
ဟောင်ကန်၊ဖာဝေါ၊ပန်နောင်လုံ၊
ဝိန်းဆန်း၊အောက်ဈေးတန်း၊အလယ်ဝိုင်း)
အုပ်ချုပ်ရေးမှူးရုံး

မြို့နယ်အုပ်ချုပ်ရေးမှူး
(ဆန်းထွန်း၊၁၀/၃၉၂၄၄)

ဖြန့်ဝေခြင်း

သက်ဆိုင်ရာပုဂ္ဂိုလ်များ(အားလုံး)

မိတ္တူကို

ခရိုင်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ကျိုင်းတုံမြို့
ရုံးလက်ခံစာတွဲ
လှည့်လည်စာတွဲ

Appendix X: Onsite Water quality result

e guard	Operation Department WQ Baseline Sampling/Survey Field Notes	E Guard-OD-EQ-F-010 Version :00	Approved by MD On Date: 02/24/2016 Page 2 of 3

Project: 230 kV Transmission Line	Date: 28.3.2017
Client:	Surveyor: Si Thu Lwin
Location: [illegible]	Time: 5:25 PM
Lat: 21° 20' 50.1" N	Long: 99° 07' 38.39" E
Evaluation:	Barometer Pressure:
Weather: Cloudy	Sample/Location ID: Surface water ([illegible]) GPS Waypoint no: Temperature: 23.7°C Time: 5:25 PM
Turbidity by Sechi Depth (cm):	
NTU converted from chart:	

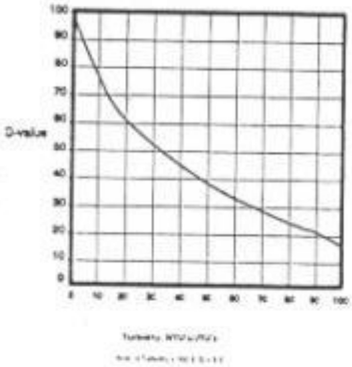
Surface/Ground/Effluent Water

Sr. No.	pH	Electrical Conductivity			DO (mg/L)	Flow Rate (m/sec)	Depth (ft)	Remark
		EC (µS/cm)	TDS (mg/L)	Salinity (ppt)				
	8.095	217	217	0.0	7.97		2 ft	

Length to Turbidity Conversion Chart

cm	NTU
< 6	> 240
6 to 7	240
7 to 8	185
8 to 9	150
9 to 10	120
10 to 12	100
12 to 14	84
14 to 16	60
16 to 19	48
19 to 21	40
21 to 24	35
24 to 26	30
26 to 29	27
29 to 31	24

cm	NTU
31 to 34	21
34 to 36	19
36 to 39	17
39 to 41	15
41 to 44	14
44 to 46	13
46 to 49	12
49 to 51	11
51 to 54	10
54 to 57	9
57 to 60	8
60 to 70	7
70 to 85	6
> 85	< 5



Environmental Quality Team leader

eguard ENVIRONMENTAL SERVICES | Operation Department WQ Baseline Sampling/Survey Field Notes | E Guard-OD-EQ-F-010 Version :00 | Approved by MD On Date: 02/24/2016 Page 2 of 3

Project: Power Transmission Line	Date: 1.4.2017 (Sat)
Client:	Surveyor: Si Thu Lwin
Location:	Time: 2:37 PM
Lat: 21° 13' 14.88" N	Long: 98° 43' 14.14" E
Evaluation:	Barometer Pressure:
Weather: Cloudly	Sample/Location ID: Surface water GPS Waypoint no: Temperature: 25.4 °C Time: 2:37 PM
Turbidity by Sechi Depth (cm):	
NTU converted from chart:	

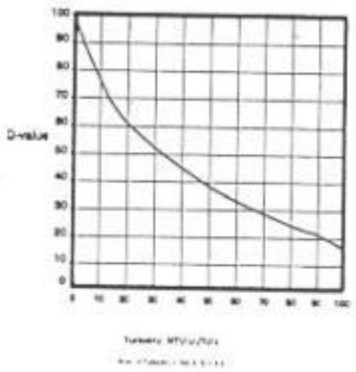
Surface/Ground/Effluent Water

Sr. No.	pH	Electrical Conductivity EC (µS/cm)	TDS (ppm) mg/L	Salinity (ppt)	DO (ppm) mg/L	Flow Rate (m/sec)	Depth (m)	Remark
	8.47	250	250	0.0	8.30		1ft	

Length to Turbidity Conversion Chart

cm	NTU
< 6	> 240
6 to 7	240
7 to 8	185
8 to 9	150
9 to 10	120
10 to 12	100
12 to 14	84
14 to 16	60
16 to 19	48
19 to 21	40
21 to 24	35
24 to 26	30
26 to 29	27
29 to 31	24

cm	NTU
31 to 34	21
34 to 36	19
36 to 39	17
39 to 41	15
41 to 44	14
44 to 46	13
46 to 49	12
49 to 51	11
51 to 54	10
54 to 57	9
57 to 60	8
60 to 70	7
70 to 85	6
> 85	< 5



Htay Mg
Environmental Quality Team Leader

eguard ENVIRONMENTAL SERVICES

Operation Department

WQ Baseline Sampling/Survey Field Notes

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Project: 230kv Transmission Line	Date: 26.3.2017 (SUN)
Client:	Surveyor: Si Thu Lwin
Location: Kyaing Tong	Time: 12:25 pm
Lat: 21° 16' 39.67" N	Long:

eguard ENVIRONMENTAL SERVICES

Operation Department

WQ Baseline Sampling/Survey Field Notes

E Guard-OD-EQ-F-010 Version :00

Approved by MD On Date: 02/24/2016 Page 2 of 3

Project: Power transmission Line	Date: 1-4-2017 (Sat)
Client:	Surveyor: Si Thu Lwin
Location: Hsert Moung	Time: 11:48 a.m
Lat: 21° 17' 2833.78" N	Long: 98° 49' 42.46" E
Evaluation:	Barometer Pressure:
Weather: Sunny	Sample/Location ID: Surface water (Result) GPS Waypoint no: Temperature: 28°C Time: 11:48 a.m
Turbidity by Sechi Depth (cm):	
NTU converted from chart:	

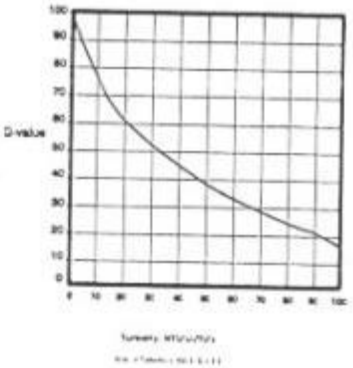
Surface/Ground/Effluent Water

Sr. No.	pH	Electrical Conductivity			DO (ppm)	Flow Rate (m/sec)	Depth (m)	Remark
		EC (µS/cm)	TDS (ppm)	Salinity (ppt)				
	8-14	83-1	53 mg/L	0.0	7.70 mg/L		1ft	

Length to Turbidity Conversion Chart

cm	NTU
< 6	> 240
6 to 7	240
7 to 8	185
8 to 9	150
9 to 10	120
10 to 12	100
12 to 14	84
14 to 16	60
16 to 19	48
19 to 21	40
21 to 24	35
24 to 26	30
26 to 29	27
29 to 31	24

cm	NTU
31 to 34	21
34 to 36	19
36 to 39	17
39 to 41	15
41 to 44	14
44 to 46	13
46 to 49	12
49 to 51	11
51 to 54	10
54 to 57	9
57 to 60	8
60 to 70	7
70 to 85	6
> 85	< 5



Environmental Quality Team Leader

Appendix XI: Water quality Laboratory result

ISO TECH LABORATORY

TRACE CERTIFIED

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

W071327

WATER QUALITY TEST RESULTS FORM

Client	Power Line Transmission
Nature of Water	Surface Water
Location	Shan State
Date and Time of collection	04.04.2017
Date and Time of arrival at Laboratory	05.04.2017
Date and Time of commencing examination	11.04.2017
Date and Time of completing	11.04.2017

Results of Water Analysis			WHO Drinking Water Guideline (Geneva - 1993)
pH	7.6		6.5 - 8.5
Colour (True)		TCU	15 TCU
Turbidity		NTU	5 NTU
Conductivity		micro S/cm	
Total Hardness		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		mg/l	0.3 mg/l
Chloride (as CL)		mg/l	250 mg/l
Sodium chloride (as NaCL)		mg/l	
Sulphate (as SO_4)		mg/l	200 mg/l
Total Solids		mg/l	1500 mg/l
Suspended Solids	56	mg/l	
Dissolved Solids		mg/l	1000 mg/l
Manganese		mg/l	0.05 mg/l
Phosphate		mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Magnesium		mg/l	0.5 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: Soe Thit
B.E (Civil) 1990,
Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)
No.18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
Ph: 01-640955, 09-73225175, 09-73242162, Fax: 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

ISO TECH LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung
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TRACE CERTIFIED

WTL-RE-001
Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 2 of 2

W071327

WATER QUALITY TEST RESULTS FORM

Client	Power Line Transmission
Nature of Water	Surface Water
Location	Shan State
Date and Time of collection	04.04.2017
Date and Time of arrival at Laboratory	05.04.2017

Occupational and Environmental Health Laboratory

No. (250), Lower Kyeemyindine Rood, Ahlone Township, Yangon, Myanmar.
Tel: +9567-431139, 431138, +951-221387, 210844,
Fax: +9567-431139, +951-223824

Sample Name:	Surface Water	Received Date:	05-04-2017
		Reported Date	26-04-2017
		Reg no:	12/2015
Address:	Power Line Transmission (Shan State)		

Analyses	Ref: Value	Unit	Result	Method
Total Coliform	0	CFU/ 100 ml	13	Membrane Filtration Method by Potatest Incubation Kit

Tested by
OH(lab)
Daw Aye Aye Thinn
Med-Tech

Checked by
Daw Than Aye
Lab Officer

Signed by
Dr. Kyi Lwin Oo
Director
Occupational and Environmental Health Division

SGS

ORIGINAL

ANALYSIS REPORT

Job Ref: 358/2017
Date : 12 April,2017
Page 1 of 1

Sample Described as	:	**ENVIRONMENTAL WATER**
Client Name	:	**E GUARD ENVIRONMENTAL SERVICES CO., LTD.**
		No. 99, Mya Kan Thar Street, 10 Miles, Yangon, Myanmar
Project Name	:	POWER LINE TRANSMISSION
Sample Brought By	:	Client
Sample Marks	:	SURFACE WATER
Location	:	SHAN STATE
Sample Received Date	:	05.04.2017
Analysed Date	:	12.04.2017
Lab Code No.	:	358/2017

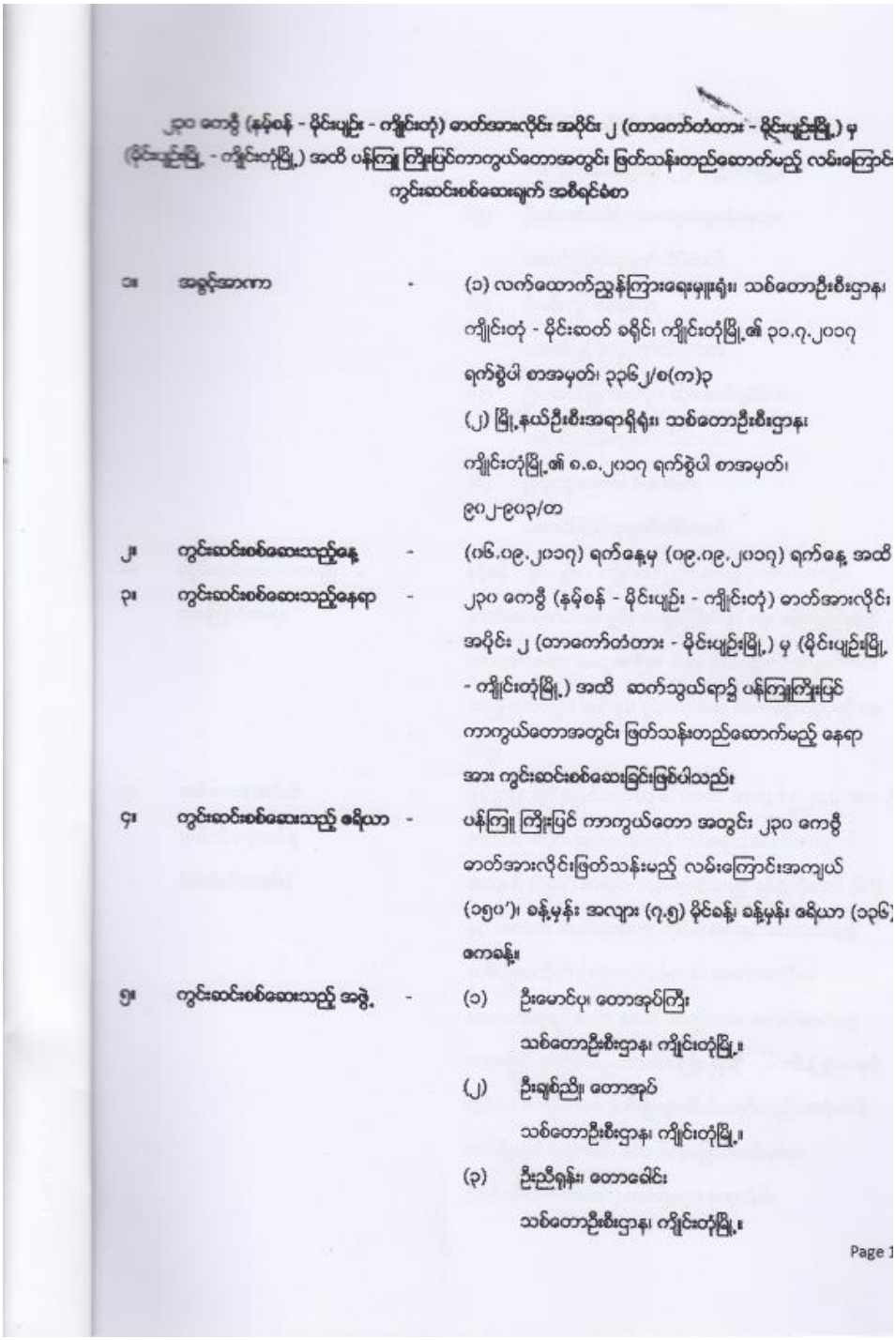
No.	Test Parameter	Unit	Result	Method	Detection Limit
1.	Oil & Grease	mg/l	<5	Standard methods for the examination of water & waste water APHA ,AWWA & WEF ,22nd ed, 2012:5520B	5
2.	Total Phosphorus	mg/l	0.00	Standard methods for the examination of water & waste water APHA ,AWWA & WEF ,22nd ed, 2012:4500-P E.Ascorbic Acid Method	0.01
3.	Total Nitrogen	mg/l	<1	Standard methods for the examination of water & waste water APHA ,AWWA & WEF ,22nd ed, 2012:4500-N_B.Macro Kjeldahl Method	1

End Of Report

SGS (Myanmar) Limited

(Nu Nu Yi)
Manager

Appendix XII: Pan Kyuu PPF



၂၃၀ ကေဒို (နှမ်စန် - မိုင်းပျဉ်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း အဝိုင်း ၂ (တာကော်တံတား - မိုင်းပျဉ်းမြို့) မှ (မိုင်းပျဉ်းမြို့ - ကျိုင်းတုံမြို့) အထိ ပန်ကြူ ကြိုးပြင်ကာကွယ်တောအတွင်း ဖြတ်သန်းတည်ဆောက်မည့် လမ်းကြောင်း ကွင်းဆင်းစစ်ဆေးချက် အစီရင်ခံစာ

၁။ အခွင့်အာဏာ - (၁) လက်ထောက်ညွှန်ကြားရေးမှူးရုံး၊ သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံ - မိုင်းဆတ် ခရိုင်၊ ကျိုင်းတုံမြို့၏ ၃၁.၇.၂၀၁၇ ရက်စွဲပါ စာအမှတ်၊ ၃၃၆၂/စ(က)၃

(၂) မြို့နယ်ဦးစီးအရာရှိရုံး၊ သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံမြို့၏ ၈.၈.၂၀၁၇ ရက်စွဲပါ စာအမှတ်၊ ၉၀၂-၉၀၃/တ

၂။ ကွင်းဆင်းစစ်ဆေးသည့်နေ့ - (၁၆.၁၉.၂၀၁၇) ရက်နေ့မှ (၁၉.၁၉.၂၀၁၇) ရက်နေ့ အထိ

၃။ ကွင်းဆင်းစစ်ဆေးသည့်နေရာ - ၂၃၀ ကေဒို (နှမ်စန် - မိုင်းပျဉ်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း အဝိုင်း ၂ (တာကော်တံတား - မိုင်းပျဉ်းမြို့) မှ (မိုင်းပျဉ်းမြို့ - ကျိုင်းတုံမြို့) အထိ ဆက်သွယ်ရာ၌ ပန်ကြူကြိုးပြင် ကာကွယ်တောအတွင်း ဖြတ်သန်းတည်ဆောက်မည့် နေရာ အား ကွင်းဆင်းစစ်ဆေးခြင်းဖြစ်ပါသည်။

၄။ ကွင်းဆင်းစစ်ဆေးသည့် ဧရိယာ - ပန်ကြူ ကြိုးပြင် ကာကွယ်တော အတွင်း ၂၃၀ ကေဒို ဓာတ်အားလိုင်းဖြတ်သန်းမည့် လမ်းကြောင်းအကျယ် (၁၅၀') ၊ ခန့်မှန်း အလျား (၇.၅) မိုင်ခန့်၊ ခန့်မှန်း ဧရိယာ (၁၃၆) ဧကခန့်။

၅။ ကွင်းဆင်းစစ်ဆေးသည့် အဖွဲ့ - (၁) ဦးမောင်ပု၊ တောအုပ်ကြီး
သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံမြို့။

(၂) ဦးချစ်ညို၊ တောအုပ်
သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံမြို့။

(၃) ဦးညီရွှန်း၊ တောဧရိယာ
သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံမြို့။

Page 1

Appendix XII: Mong Zin PPF

(နမ့်စန် - မိုင်းပျဉ်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း အဝိုင်း ၂ (တာကော်တံတား - မိုင်းပျဉ်းမြို့) မှ
(မိုင်းပျဉ်းမြို့ - ကျိုင်းတုံမြို့) အထိ မိုင်ဇင်းကြိုးပြင်တော အတွင်း ၅/၁၉၈၆ စီးပွားရေး ဝိတောက်စိုက်ခင်း (၁၀၀)
ကောတွင် ဖြတ်သန်းသွားမည့် ၂၃၀ ကေဗွီ ဓာတ်အားလိုင်း ကွင်းဆင်းစစ်ဆေးခြင်း အစီရင်ခံစာ

၁။ အခွင့်အာဏာ - (၁) လက်ထောက်ညွှန်ကြားရေးမှူးရုံး၊ သစ်တောဦးစီးဌာန၊
ကျိုင်းတုံ - မိုင်းဆတ် ခရိုင်၊ ကျိုင်းတုံမြို့၏ ၃၁.၇.၂၀၁၇
ရက်စွဲပါ စာအမှတ်၊ ၃၃၆၂/စ(က)၁၃
(၂) မြို့နယ်ဦးစီးအရာရှိရုံး၊ သစ်တောဦးစီးဌာန၊
ကျိုင်းတုံမြို့၏ ၈.၈.၂၀၁၇ ရက်စွဲပါ စာအမှတ်၊
၉၀၂-၉၀၃/တ

၂။ ကွင်းဆင်းစစ်ဆေးသည့်နေ့ - (၁၂.၀၉.၂၀၁၇) ရက်နေ့

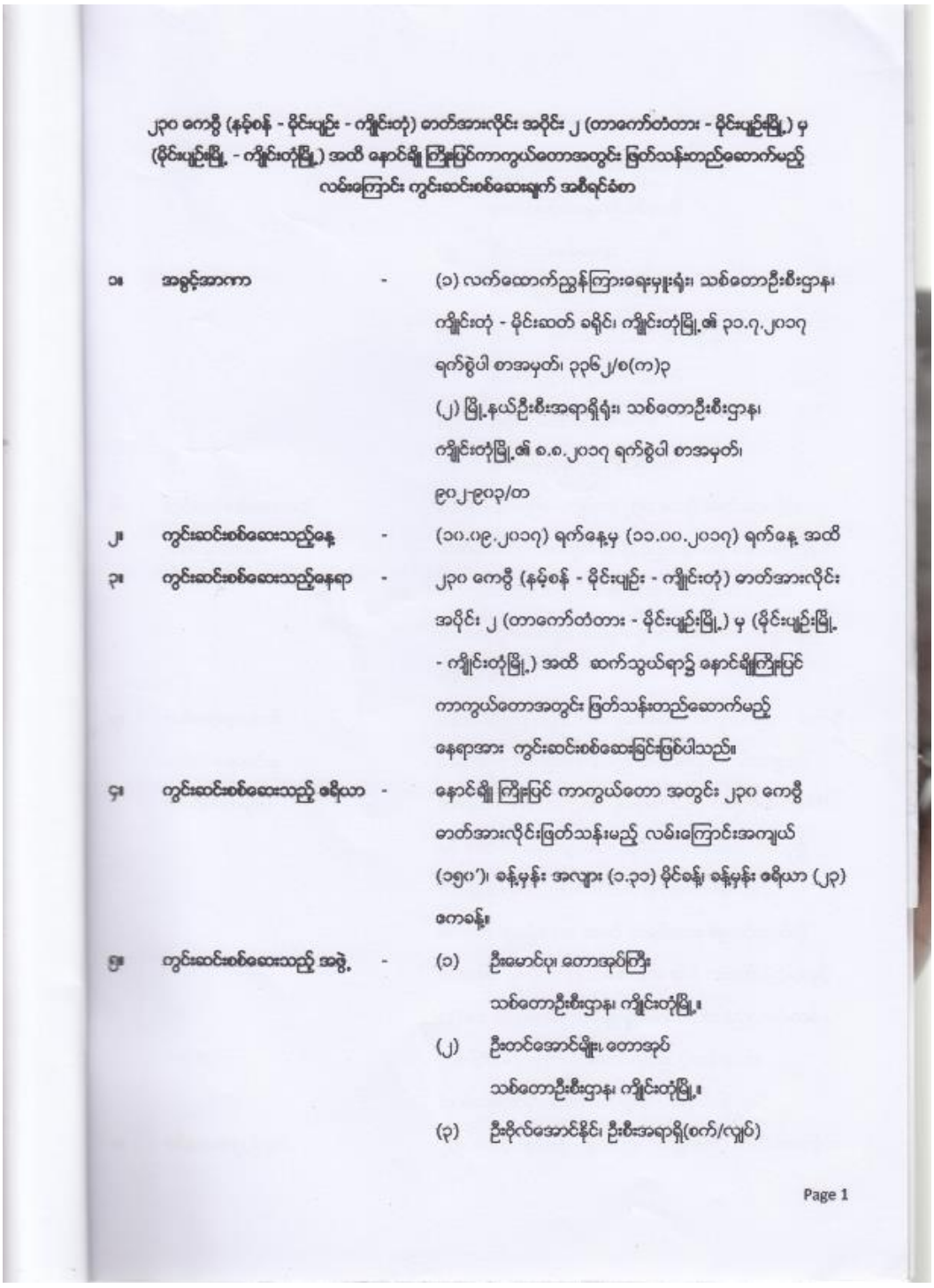
၃။ ကွင်းဆင်းစစ်ဆေးသည့်နေရာ - ၂၃၀ ကေဗွီ (နမ့်စန် - မိုင်းပျဉ်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း
အဝိုင်း ၂ (တာကော်တံတား - မိုင်းပျဉ်းမြို့) မှ (မိုင်းပျဉ်းမြို့
- ကျိုင်းတုံမြို့) အထိ ဆက်သွယ်ရာ၌ မိုင်းဇင်း ကြိုးပြင်တောရှိ
၅/၁၉၈၆ စီးပွားရေး (ဝိတောက်) စိုက်ခင်း (၁၀၀) ဧက အတွင်း
ဖြတ်သန်းတည်ဆောက်မည့် ဓနရာအား ကွင်းဆင်းစစ်ဆေးခြင်း
ဖြစ်ပါသည်။

၄။ ကွင်းဆင်းစစ်ဆေးသည့် ဧရိယာ - မိုင်းဇင်း ကြိုးပြင်တောရှိ ၅/၁၉၈၆ စီးပွားရေး (ဝိတောက်)
စိုက်ခင်း (၁၀၀) ဧက အတွင်း ၂၃၀ ကေဗွီ ဓာတ်အားလိုင်း
ဖြတ်သန်းမည့် လမ်းကြောင်းအကျယ်(၁၅၀')၊ခန့်မှန်း
အလျား (၀.၂၆) မိုင်ခန့်၊ ခန့်မှန်း ဧရိယာ (၄.၀၅) ဧကခန့်။

၅။ ကွင်းဆင်းစစ်ဆေးသည့် အဖွဲ့ - (၁) ဦးဇော်မြင့်၊ တောအုပ်
သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံမြို့။
(၂) ဦးယောဘ၊ တောခေါင်း
သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံမြို့။

Page 1

Appendix XIII: Naung Cho PPF



၂၃၀ ကေဒို (နမ့်စန် - မိုင်းပျဉ်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း အဝိုင်း ၂ (တာကော်တံတား - မိုင်းပျဉ်းမြို့) မှ (မိုင်းပျဉ်းမြို့ - ကျိုင်းတုံမြို့) အထိ ဓနာင်မျိုး ကြိုးပြင်ကာကွယ်တောအတွင်း ဖြတ်သန်းတည်ဆောက်မည့် လမ်းကြောင်း ကွင်းဆင်းစစ်ဆေးမှုက် အစီရင်ခံစာ

၁။ အခွင့်အာဏာ - (၁) လက်ထောက်ညွှန်ကြားရေးမှူးရုံး၊ သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံ - မိုင်းဆတ် ခရိုင်၊ ကျိုင်းတုံမြို့၏ ၃၁.၇.၂၀၁၇ ရက်စွဲပါ စာအမှတ်၊ ၃၃၆၂/စ(က)၃

(၂) မြို့နယ်ဦးစီးအရာရှိရုံး၊ သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံမြို့၏ ဧ.ဧ.၂၀၁၇ ရက်စွဲပါ စာအမှတ်၊ ၉၀၂-၉၀၃/တ

၂။ ကွင်းဆင်းစစ်ဆေးသည့်နေ့ - (၁၀.၁၉.၂၀၁၇) ရက်နေ့မှ (၁၁.၁၀.၂၀၁၇) ရက်နေ့ အထိ

၃။ ကွင်းဆင်းစစ်ဆေးသည့်နေရာ - ၂၃၀ ကေဒို (နမ့်စန် - မိုင်းပျဉ်း - ကျိုင်းတုံ) ဓာတ်အားလိုင်း အဝိုင်း ၂ (တာကော်တံတား - မိုင်းပျဉ်းမြို့) မှ (မိုင်းပျဉ်းမြို့ - ကျိုင်းတုံမြို့) အထိ ဆက်သွယ်ရာ၌ ဓနာင်မျိုးကြိုးပြင် ကာကွယ်တောအတွင်း ဖြတ်သန်းတည်ဆောက်မည့် နေရာအား ကွင်းဆင်းစစ်ဆေးခြင်းဖြစ်ပါသည်။

၄။ ကွင်းဆင်းစစ်ဆေးသည့် ဧရိယာ - ဓနာင်မျိုး ကြိုးပြင် ကာကွယ်တော အတွင်း ၂၃၀ ကေဒို ဓာတ်အားလိုင်းဖြတ်သန်းမည့် လမ်းကြောင်းအကျယ် (၁၅၀')၊ ခန့်မှန်း အလျား (၁.၃၁) မိုင်ခန့်၊ ခန့်မှန်း ဧရိယာ (၂၃) ဧကခန့်။

၅။ ကွင်းဆင်းစစ်ဆေးသည့် အဖွဲ့ - (၁) ဦးဇေမာပု၊ တောအုပ်ကြီး သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံမြို့။

(၂) ဦးတင်အောင်မျိုး၊ တောအုပ် သစ်တောဦးစီးဌာန၊ ကျိုင်းတုံမြို့။

(၃) ဦးဝိုလ်အောင်နိုင်၊ ဦးစီးအရာရှိ(စက်/လျှပ်)

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Appendix XIV: Experts CV in Management, Electric and Magnetic Field (EMP) Risk Assessment and Hazard Management

CURRICULUM VITAE (CV)

Position Title and No.	GM/Renewable Energy Expert
Name of Expert:	Than Oo
Date of Birth:	29/09/1967
Citizenship	Myanmar

Education:

- 1985 – 1994, Bachelor of Engineering in Electric Power (FINAL GPA 4.5/5), Yangon Institute of Technology, Insein, Yangon, Myanmar
- 2003-2004, Master of Engineering in Electric Power System Management (GPA 3.33/4), Asian Institute of Technology, Bangkok, Thailand

Employment record:

Time/ Country	Employing organization and your title/position. Contact information for references	Summary of activities performed
June 2015to Present, Yangon, Myanmar	General Manager/Energy Specialist in Sustainable Environment Myanmar Co., Ltd. 2B, Shwe Kain Nayee Housing Estate Na Nataw Street, Kamayut Township Yangon, Myanmar Tel : +951 503571 , (HP) +959 4211 70514 Oothanoo67@gmail.com star.thanoo@gmail.com	Project manager to Environmental and Social Impact Assessment (ESIA) work for infrastructure project such as Thermal Power Plant, Hydropower Projects, Transmission Line Projects and other sectors such as oil and gas exploration, cement factory and special economic zone development
Oct. 2014 to June 2015	FULL-TIME BUSINESS CONSULTANT MJBC, M&J Business Consulting	TEACHING AND CONSULTING FOR PRODUCTION MANAGEMENT AS BELOW; *"MONOZUKURI"* AND CUSTOMER'S VIEWPOINT DAILY MANAGEMENT AND START UP CHECKING 5S MANAGEMENT STANDARDIZATION MANAGEMENT OPERATION STANDARD CHANGE POINT MANAGEMENT CLAIM MANAGEMENT VISUAL MANAGEMENT PROBLEM-SOLVING METHODS IMPROVEMENT AND QC CIRCLE
Jan 2014 To July 2014	ENERGY SPECIALIST E Guard Environmental Services	High Level ESHIA Study for a Coal Fired Power Plant Project in Myanmar engaged with ERM Preparatory Survey on Thilawa SEZ Development Project (2,000 ha) Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) engaged with ERM (Japan) Environment Management Plan (EMP) Sawbwa VT Limited: Garment Factory, Yangon Industry Zone, Mingalardon Garden City

Oct 2013 To Jan 2014	ENERGY SALES DIRECTOR Schneider Electric Oversea Asia (Myanmar)	Responsible for MV equipments and solutions such as 11/33 kV Switchgears, Transformers, DS and Reclosers, IEDs, SCMS and products: Evolis, HVX, SF F400 etc...
Nov 2012To Sep 2013	SENIOR MANAGER, POWER GENERATION PRIMUS ENERGY	(Project Engineering - E.P.C - Power generation - Construction & Development - Agriculture - Environmental & Water Engineering) Working together with international firms such as Toshiba, Siemens for Transmission sector, Sinohydro Corporation, EGCO and PTTI for power generation sector. For power generation projects, we made preliminary survey by our own facilities and FS by internal consultants from our partners. We were involving in some CCGT/ CCPP plants and some hydro power projects. Our significant achievement was in Kyauk Se Fast Track 100 MW Gas Turbines contract with APR Energy.
March 2012 To October 2012	DIRECTOR, ENGINEERING GLOBAL QUALITY MANAGEMENT (GQM) PTE LTD. SOLUNA INTERNATIONAL PTE LTD	Focuses : International Trading, Energy and Power, Generation and Transmission Businesses Particular Interest Projects: (1) OPGW Supply, Tools & Equipments and live line installation (2) SCADA / EMS initiation and Power Automation (3) Power Barges & Gas turbines (4) Gas & Steam turbines (CCPP) Major Overhaul Services
Aug 2011 To Nov 2011	DEPUTY FACTORY SUPERINTENDENT Honda (Myanmar) Wood Mill & Parquet and Plywood Factory (Sagaing) Great Wall Foodstuff Industry Company Limited (Mandalay & Maddayar)	DUTIES: Factory expansion, new machineries installation, reviewing organization structure and assigning duties and responsibilities
June 2010 To July 2011	RESEARCH ASSOCIATE School of Electrical and Electronics Engineering NANYANG TECHNOLOGICAL UNIVERSITY 50 NANYANG AVENUE, #04-00 SINGAPORE 639798	DEVELOPMENT OF POWER ELECTRONICS AND CONVERTERS, Distributed Energy Resources (DER) integration and Renewable Energy Applications, Microgrids Design and Operation, Economic Reliability and Security studies for the future Grid "POWER CONVERTER AND GRID ARCHITECTURAL DESIGN FOR FUTURE INTELLIGENT DISTRIBUTION NETWORKS" SUPPORTED BY AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH (ASTAR), Singapore's leading agency fostering world-class scientific research and talent for a vibrant knowledge-based Singapore.
May 2007 – June 2010	SENIOR ELECTRICAL ENGINEER AND PROJECT MANAGER Gulf Energy Technology and Projects P.O.Box – 10161, Al-Nawar Building, Salwa Road, Doha, Qatar	MORE THAN 3 Years Professional experiences in Tendering, Cost estimation and control of Erection, commissioning and testing of electrical installation, Facilities Management and Maintenance of various petro-chemical plant in Qatar PROJECT EXECUTED/ ONGOING (PARTIAL LIST)

		□ Installation of pumps for Corrshield injection to PE coolant system, QCHEM (Completed- From the beginning to the end) □ Supervision of Electrical Installation for Qatalum Site Project, Messaieed □ Installation of ATS panel and cable laying, Termination at Industrial Area, Harliburton Worldwide (Completed – From the beginning to the end) □ Change of Junctions boxes in Turbine Hood to suit use of water mist for the fire protection at PS2/PS3, QP Offshore (Completed) □ Lighting Maintenance at Gas Operations, Maesaieed on call off basis for 3 years, Qatar Petroleum (On going) □ Contract No.:GC071053A0, Maintenance of the Street/Outdoor lighting installations on a call-off basis within Dukhan Fields, Qatar Petroleum (On going) □ Contract No. GC08114100: Maintenance of Street Lighting System in Mesaieed for five years, Qatar Petroleum (On going) □ Contract No. 9401342: Supply of Electrical and Automation Technicians for a period of 5 years, Qatar Petrochemical Company (On going)
December 2005 – April 2007	FOR CONSULTANCY (SENIOR ELECTRICAL ENGINEER) Starlite Joint Venture - Exhibition, Lighting and Interior Design Bangkok - Thailand	
August 2004 – April 2007	LABORATORY MANAGER Research Laboratory, Energy Technology Electric Power System Management Energy Program, School of Environmental, Resources and Developments Asian Institute of Technology (AIT), Thailand	Responsible for teaching in specific laboratory sessions and Tutorials for post graduate level Assist teaching in laboratory sessions and Classes □ Laboratory equipments set-up □ Working for the contracted projects and Energy Park with Professors, Supervisor, Research Associates and Technicians □ Participate Conferences, Workshops and Seminars
December 2002 – February 2006	ELECTRICAL MAINTENANCE CONSULTANT (PART TIME ON CONTRACT BASIS) Thai Malleable Iron & Steel Co., Ltd. Klong Luang, Pathumthani, Thailand	□ Maintaining Electrical, Electronics and computers for Robots and other machines □ Troubleshooting the electrical problem of PC based machines such as Molding machine, Core making machine, Auto-tapping machines, Induction Furnaces □ Drawing such as machine parts, Layouts, Control circuits, Power Line Diagram □ Preparing Preventive maintenance scheme and daily, weekly and monthly checklists □ Documentation for ISO 9002 □ Facilities Maintenance
April 1996 – December 2002	PROJECT ENGINEER (MAINTENANCE MANAGER) Thai Malleable Iron & Steel Co., Ltd. Klong Luang, Pathumthani, Thailand	□ Incharge for all Electrical installations, commissioning & Testing till the project got Site Acceptance. □ To make sure all the machines are installed properly and test the Electrical suppliers before the machines were operated. □ Also leaded this project with additional responsibilities of Safety and Quality Control.

March 1995 – February 1996	DESIGN AND PRODUCTION ENGINEER Myanmar Electric and Trading Co-operative Ltd., Yangon, Myanmar (Burma)	□ Supervising the production of the Electrical Appliances □ Designing printed circuit board (PCB) and repairing the Electrical Appliances
March 1994 – February 1995	INSTALLATION AND SERVICING ENGINEER Challenger Engineering Group Yangon, Myanmar (Burma)	□ Installation of Ai-conditioning and Refrigeration for domestic use □ Servicing the Air-conditioners and Refrigerators

Membership in Professional Associations and Publications:

- Member MES 2011 to Present.
- Member IEEE, from 2004 to 2007.
- Student Member IEEE, from 2003 to 2004.
- Member IEEE, from 2000 to 2002.
- Associate Member MES (Myanmar Engineering Society) from 2001 to 2007.
- Junior Member MES (Myanmar Engineering Society) from 1996 to 2001.

Awards & Achievements

- Grade A Electrical Engineer License, State of Qatar (2009)
- Prospect Burma Partial Scholarship Award (2004)
- Prospect Burma Partial Scholarship Award (2003)
- AIT Fellowship (from January 2003 to August 2004)
- AIT Research Initiative Grant (from January 2004 to August 2004)
- First Grade of Electrician Registration Certificate (since 1995)
- Electrical Inspection Department, Ministry of No 1. Industry
- Government of Union of Myanmar

PUBLICATIONS AND REPORTS

Thesis (Master)
"Low Frequency Power System Oscillation Damping using a Unified Power Flow Controller" Asian Institute of Technology, ET04-4, August 2004.
Report –

- Than Oo and Le Van Phu, "Dispersed or Distributed Generator Placement in Power Distribution System using Genetic Algorithm" Electric Power System Management, AIT, October 2003.
- Than Oo, "Small-signal Stability Analysis in the Electric Power System" Electric Power System Management, AIT, April 2004
- Than Oo, "Initial Investigation of Sites Arrangement for AIT Micro-grid Project" Electric Power System Management, AIT, July 2005.
- Than Oo, "Recommendation Report for Upgrading Sub-station No. 1" Electric Power System Management, AIT, October 2005.
- Than Oo, "Demonstration Project for Advanced PV connected micro-grid" A draft Proposal, Energy Technology, AIT, February 2007.

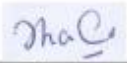
Conference -

- Elena May Yee Yap, Majid Al-Dabbagh, Sarath K. Kapuduwage , Than Oo and Nemat, Talebi, "HVDC and FACTS for power delivery through long transmission lines " PES in south Africa, 16 June 2005.

Journal

- N. Minthulananthan, Than Oo and Le Van Phu, "Distributed Generator Placement in Power Distribution System using Genetic Algorithm to Reduce Losses" TIJSAT, 9(3), (July- September 2004), 55-62.
- N. Minthulananthan and Than Oo, "Distributed Generator Placement to Maximize the Loadability of Distribution System" International Journal of Electrical Engineering Education IJEEE 43/2, April 2006, Manchester University Press, Oxford Road, Manchester M13 9NR.

Certification: I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience, and I am available to undertake the assignment in case of an award. I understand that any misstatement or misrepresentation described herein may lead to my disqualification or dismissal by the Client, and/or sanctions by the Bank.

Than Oo		31/07/2018
Name	Signature	Date

CURRICULUM VITAE

Personal data

Name	Ru Par Kyaw
Contact Address/ Email	No.26, 4th floor, Seson Street, Sanchaung Township ruparkyaw@eguardservices.com
Contact Number	+95(0)9797005185, +95(0)698753507
Date of Birth	August 7, 1996
Nationality	Myanmar
Sex	Female
Marital Status	Single
NRC No.	12/Sa Kha Na (Naing) 072870
Passport No.	_
Language Proficiency	Myanmar - Native Speaker English - pre-intermediate level

Educational qualifications

BACHELOR OF ENGINEERING (Electrical Power)	**December 2016 to November 2018** **West Yangon Technological University**
BACHELOR OF TECHNOLOGY (Electrical Power)	**December 2012 to November 2016** **West Yangon Technological University**

Training and Certificate

First Aid Training	**2nd August – 3rd August 2019** **Trust Oo Co., Ltd.**
"ISO 9001:2015 Internal Auditior Training" Quality Management System	**13th July _ 14th July2019** **CMSP, Yangon.**
Value Star	**2017** **Certificates in Auto CAD**
Strategy First	**2017** **Certificates in essential skills for business careers**
KMD	**2013** **Certificates in i-office**

No. 11, Airport Avenue Road ,Yangon Airport Road, Saw Bwar Gyi Gone Quarter, Insein Township, Yangon 11011, Myanmar.
Email: info@eguardservices.com

Update- November 2018

Project Assistant | **Ru Par Kyaw** E Guard-CV 2018

WORK UNDERTAKEN/ TASKS ASSIGNMENT

Name of assignment or Project	**PTTEP**
Year:	August, 2019
Location:	Thanintharyi Region
Client:	PTTEP International Limited
Main project features:	EIA
Position held:	Project Assistant
Activities performed:	SHM, data entry
Name of assignment or Project	**June Limestone**
Year:	June, 2019
Location:	Kyaikmaraw
Client:	June Cement Industry Limited
Main project features:	EIA
Position held:	Project Assistant
Activities performed:	Social survey and data analysis, SHM
Name of assignment or Project	**Thigyit Coal Fired Power Plant**
Year:	**February, 2019**
Location:	**Pin Laung Township**
Client:	**Wu Xi Hua Guar Electric Power Engineering Co., LtdEIA**
Main project features:	**EIA**
Position held:	**Project Assistant**
Activities performed:	**SHM**

Ru Par Kyaw **Date: 26.April.2019**

No. 11, Airport Avenue Road ,Yangon Airport Road, Saw Bwar Gyi Gone Quarter, Insein Township, Yangon 11011, Myanmar.
Email: info@eguardservices.com

Update- November 2018

ရှမ်းပြည်နယ် (အရှေ့ပိုင်း) တွင် အကောင်အထည်ဖော် ဆောင်ရွက်မည့် ၂၃၀ ကေဗွီ နမ့်စန် - မိုင်းပျဉ်း - ကျိုင်းတုံ မာတ်အားလိုင်း အပိုင်း (၂) စီမံကိန်း လုပ်ငန်းအတွက် အောင်မြင့်မိုရ်ကုမ္ပဏီမှ တင်ပြလာသော ကနဦးပတ်ဝန်းကျင် ဆန်းစစ်ခြင်း အစီအရင်ခံစာအပေါ် စီစစ်တွေ့ရှိချက်နှင့် သုံးသပ်အကြံပြုချက်များ

စဉ်	စီစစ်တွေ့ရှိချက်များ	သုံးသပ်အကြံပြုချက်များ	ပြန်လည်ဖြေကြားချက်များ
၁။	အကျဉ်းချုပ်အစီရင်ခံစာ (Executive Summary)		
	- အကျဉ်းချုပ်အစီရင်ခံစာတွင် စီမံကိန်း နောက်ခံအကြောင်းအရာ၊ လက်တွေ့ကွင်းဆင်းလေ့လာခြင်း ရလဒ်များ၊ အနီးပတ်ဝန်းကျင်ရှိ အခြေအနေများ၊ ကျန်းမာရေးနှင့် လူမှုစီးပွားရေး စစ်တမ်းများ ကောက်ယူခဲ့ကြောင်း၊ - စီမံကိန်းကြောင့် လူမှုပတ်ဝန်းကျင်အား သက်ရောက်မှုများနှင့် လျော့ချမည့် အစီအစဉ်များ၊ ပတ်ဝန်းကျင် အစီအစဉ်များ၊ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်၊ စောင့်ကြပ်ကြည့်ရှုမှု အစီအစဉ်၊ ကျန်းမာရေးနှင့် ဘေးကင်းလုံခြုံရေး အစီအစဉ်၊ အရေးပေါ် အစီအစဉ်နှင့် လူမှုစီးပွားရေးအတွက် တာဝန်ယူမှုနှင့် တာဝန်သိတတ်မှု အစီအစဉ်များကို အစီရင်ခံစာထဲတွင် ထည့်သွင်း ရေးဆွဲထားကြောင်းကို အကျဉ်းချုပ် ဖော်ပြထားပါသည်။		
၂။	ကတိကဝတ်		
	စာမျက်နှာ ၅၅ တွင် စီမံကိန်းအဆိုပြုသူ အောင်မြင့်မိုရ် ကုမ္ပဏီ၏ Managing Director, General manager, Manager ၃ ဦးမှ IEE အစီရင်ခံစာတွင် ပတ်ဝန်းကျင်ထိခိုက်မှု လျော့ပါးစေရေး လုပ်ငန်းများကို အကောင်အထည်ဖော် ဆောင်ရွက်မည်ဖြစ်ကြောင်း၊ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပါအဝင် သက်ဆိုင်ရာ ဥပဒေများကို တိကျစွာ လိုက်နာမည်ဖြစ်ကြောင်း။ စီမံကိန်းသည် ကနဦးပတ်ဝန်းကျင် ဆန်းစစ်ခြင်း အစီရင်ခံစာပါ ပတ်ဝန်းကျင် ထိခိုက်မှု လျော့ချရေး လုပ်ငန်းများနှင့် အစီအစဉ်များကို အပြည့်အဝ အစဉ်အမြဲ လိုက်နာ ဆောင်ရွက်မည် ဖြစ်ကြောင်း၊ ကတိကဝတ်အား ဖော်ပြထားသော်လည်း	ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် (၃၅) အရ - အစီရင်ခံစာ ရေးသားပြုစုသူမှ ကနဦးပတ်ဝန်း ကျင်ဆန်း စစ်ခြင်းသည် တိကျမှုနှင့် ပြည့်စုံမှုရှိကြောင်း ပတ်ဝန်း ကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံး လုပ်နည်း အပါအဝင် သက်ဆိုင်ရာ ဥပဒေများကို တိကျစွာလိုက်နာ ၍ ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းအား ဆောင်ရွက်ထားခြင်းဖြစ်ကြောင်း ကတိကဝတ်ကို ဖော်ပြရန်၊ - စီမံကိန်းအဆိုပြုသူနှင့် အစီရင်ခံစာ ရေးသားပြုစုသူတို့ လိုက်နာဆောင်ရွက်မည့် ကတိကဝတ်များကို သီးခြားစီ ဖော်ပြ၍ လက်မှတ် ရေးထိုးရန်၊	ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် (၃၅) အရ - အစီရင်ခံစာ ရေးသားပြုစုသူမှ ကနဦးပတ်ဝန်းကျင် ဆန်းစစ်ခြင်းသည် တိကျမှုနှင့် ပြည့်စုံမှုရှိကြောင်း ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းအပါအဝင် သက်ဆိုင်ရာ ဥပဒေများကို တိကျစွာလိုက်နာ၍ ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းအား ဆောင်ရွက်ထားခြင်းဖြစ်ကြောင်း ကတိကဝတ်ကို စာမျက်နှာ ၆၆ တွင်ဖော်ပြထားပါသည်။

	- အစီရင်ခံစာရေးသားပြုစုသူမှ ကနဦး ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းသည် တိကျမှုနှင့် ပြည့်စုံမှုရှိကြောင်း၊ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ဆိုင်ရာလုပ်ထုံးလုပ်နည်းအပါအဝင် သက်ဆိုင်ရာ ဥပဒေများကို တိကျစွာလိုက်နာ၍ ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းအား ဆောင်ရွက်ထားခြင်းဖြစ်ကြောင်း ကတိကဝတ်ကို ဖော်ပြထားခြင်းမရှိကြောင်း တွေ့ရှိ		
၃။	စီမံကိန်းနောက်ခံအကြောင်းအရာ		
	- စီမံကိန်း ဆောင်ရွက်သူအကြောင်း ရှင်းလင်းတင်ပြချက် ကဏ္ဍတွင် စီမံကိန်းတာဝန်ရှိ ဌာနအမည်ကို ဖော်ပြထားသော်လည်း ဆက်သွယ်ရန်လိပ်စာ၊ ဖုန်းနံပါတ်၊ ဖက်စ်နံပါတ်၊ အီးမေးလ် စသည်တို့နှင့် ပက်သက်၍ ဖော်ပြထားခြင်း မရှိကြောင်း စိစစ်တွေ့ရှိရပါသည်။	- စီမံကိန်းဆောင်ရွက်သူနှင့် ပက်သက်သော အကြောင်းအရာများ၊ တာဝန်ရှိဌာနနှင့် ပက်သက်သောအချက်အလက်များ (အမည်၊ လိပ်စာ၊ ဖုန်းနံပါတ်၊ ဖက်စ်နံပါတ်၊ အီးမေးလ်စသည်ဖြင့်) ကို Chapter II: Project Proponent ကဏ္ဍအောက်တွင် သီးခြားထည့်သွင်းဖော်ပြရန်	- စီမံကိန်းဆောင်ရွက်သူနှင့် ပက်သက်သော အကြောင်းအရာများ၊ တာဝန်ရှိဌာနနှင့် ပက်သက်သောအချက်အလက်များ (အမည်၊ လိပ်စာ၊ ဖုန်းနံပါတ်၊ ဖက်စ်နံပါတ်၊ အီးမေးလ်စသည်ဖြင့်) ကို Chapter II: Project Proponent ကဏ္ဍအောက် စာမျက်နှာ (၂၉) တွင် သီးခြားထည့်သွင်းဖော်ပြထားပါသည်။
၄။	စီမံကိန်းအကြောင်းအရာဖော်ပြချက်		
	- စာမျက်နှာ (၁၀၊ ၁၁၊ ၁၂၊ ၁၃၊ ၁၄) တွင် ဓာတ်ပုံများထည့်သွင်းဖော်ပြထားသော်လည်း Caption ဖော်ပြထားခြင်းမရှိကြောင်းနှင့် Line Route ကို ဖော်ပြထားရာတွင် အနီးပတ်ဝန်းကျင် အခြေအနေမှာ ရှင်းလင်းပြတ်သားခြင်းမရှိပါ။ - Existing Sub - station	- စာမျက်နှာ (၁၀၊ ၁၁၊ ၁၂၊ ၁၃၊၁၄) တွင် ထည့်သွင်းဖော်ပြထားသောဓာတ်ပုံများသည် မည်သည့်ရည်ရွယ်ချက်ဖြင့် ထည့်ထားကြောင်းကို Caption နှင့် တကွ ဖော်ပြရန်နှင့် လမ်းကြောင်းပြသည့် ဓာတ်ပုံများဖြစ်ပါက ထိုကဲ့သို့ တစ်ပိုင်းချင်းစီကွက်၍ ဖော်ပြခြင်းမပြုဘဲ Google Map တွင် Coordinate Point များနှင့်တကွ WGS 84 system ဖြင့် ရှင်းလင်းစွာ ထည့်သွင်း၍ A3 ဖြင့် ဖော်ပြရန်၊ - Existing Sub-station များအတွက်	- စာမျက်နှာ (၁၉၊ ၂၀၊ ၂၁၊ ၂၂) တွင် ဓာတ်ပုံများသည် မည်သည့်ရည်ရွယ်ချက်ဖြင့် ထည့်ထားကြောင်းကို Caption နှင့် တကွ စာမျက်နှာ ၃၀၊ ၃၁၊ ၃၂၊ ၃၃၊ ၃၄၊ ၃၅ တွင် ဖော်ပြထားပါသည်။ အသုံးပြုမည့်ကုန်ကြမ်းများရယူမည့်ပုံစံ၊ နည်းစနစ်၊ -ကုန်ကြမ်းများ သိုလှောင်မည့်စနစ်၊ သိုလှောင်မည့်တည် နေရာ - အသုံးပြုခန့်ထားမည့် အလုပ်သမား အရေအ တွက်ကို စာမျက်နှာ (၂၅၊၂၆၊၂၇၊၂၈) တွင် ဖော်ပြထားပါသည်။

		ရှင်းလင်းပြတ်သားစွာ မြင်ရသော Layout ပုံများကို ထည့်သွင်းဖော်ပြရန်နှင့်တည်နေရာများအား Google Map တွင် Coordinate Point များနှင့်တကွ WGS 84 system ဖြင့်ရှင်းလင်းစွာ ထည့်သွင်းဖော်ပြရန်၊ စီမံကိန်း တည်ဆောက်ရေးကာလတွင် - အသုံးပြုမည့် ကုန်ကြမ်းများရယူမည့် ပုံစံ၊နည်းစနစ် - ကုန်ကြမ်းများ သိုလှောင်မည့်စနစ်၊သိုလှောင်မည့်တည်နေရာ - အသုံးပြုခန့်ထားမည့် အလုပ်သမားအရေအတွက် - အလုပ်သမားများ ထားရှိမည့် Labour Camp ၏ တည်နေရာ - Labour Camp မှ ထွက်ရှိမည့် စွန့်ပစ်ရေနှင့် စွန့်ပစ်ပစ္စည်းများကြောင့် ညစ်ညမ်းမှု မရှိစေရန် ဆောက်ရွက်မှုများ၊တည်ဆောက်မှုများအား ဖော်ပြရန် သုံးစွဲမည့် ရေပမာဏ၊ ရယူမည့် အရင်းအမြစ်များ စသည်တို့ကို ထည့်သွင်းဖော်ပြရန်၊	- အလုပ်သမားများ ထားရှိမည့် Labor Camp မှ ထွက်ရှိမည့် စွန့်ပစ်ရေနှင့် စွန့်ပစ်ပစ္စည်းများကြောင့် ညစ်ညမ်းမှု မရှိစေရန် ဆောင်ရွက်မှုများ၊ တည်ဆောက်မှုများအား - သုံးစွဲမည့် ရေပမာဏ၊ ရယူမည့်အရင်းအမြစ်များ၊ - Skillful Worker များသာ အသုံးပြုခန့်ထားရန်အား စာမျက်နှာ (၂၅) တွင်ဖော်ပြထားပါသည်။ စီမံကိန်းတွင် Lubricants, Fuels and other Hydrocarbons ပမာဏ၊ သိုလှောင်မည့် တည်နေရာအား စာမျက်နှာ (၂၅) တွင် ဖော်ပြထားပါသည်။ - စီမံကိန်း လည်ပတ်ပုံ အဆင့်ဆင့်အား Layout နှင့်တကွ စာမျက်နှာ (၂၈) တွင် ဖော်ပြထားပါသည်။ စီမံကိန်းလည်ပတ်ခြင်းကာလ တွင် အသုံးပြုခန့်ထားမည့် အလုပ်သမားအရေအတွက်များအား စာမျက်နှာ (၂၅) တွင်ဖော်ပြထားပါသည်။
		- Skillful Worker များသာအသုံးပြုခန့်ထားရန်၊ - စီမံကိန်းတွင် Lubricants, Fuels and other Hydrocarbons ပမာဏ၊ သိုလှောင်မည့် တည်နေရာအား ဖော်ပြရန်၊ - စီမံကိန်း လည်ပတ်ပုံ အဆင့်ဆင့်အား Layout နှင့်တကွ အသေးစိတ်ထည့်သွင်းဖော်ပြရန်နှင့် စီမံကိန်းလည်ပတ်ခြင်းကာလ တွင် အသုံးပြုခန့်ထားမည့် အလုပ်သမားအရေအတွက်များဖော်ပြရန်၊	
၅။	လိုက်နာဆောင်ရွက်မည့် ဥပဒေ၊ နည်းဥပဒေ၊ လုပ်ထုံးလုပ်နည်းများ၊ မူဝါဒများနှင့် အပြည်ပြည်ဆိုင်ရာ စည်းမျဉ်းစည်းကမ်းများ		

	- စာမျက်နှာ ၃၀ မှ ၅၄တွင် စီမံကိန်းမှ လိုက်နာရမည့် မြန်မာနိုင်ငံအတွင်းရှိ ဥပဒေ၊ နည်းဥပဒေများ၊ လုပ်ထုံးလုပ်နည်းများဖြစ်သော Constitution of the Republic of the Union of Myanmar (2008), National Environmental Policy (1994), Enviromental Conservation Law (2012), Environmental Impact Assessment Procedure (2015), National EQEG (2015), Land Acquisition Act (1984), Social Security Law (2012), Labor Organization Law (2011), Forest Law (1994) များနှင့် နိုင်ငံတကာစည်းကမ်း သတ်မှတ်ချက်များ ဖြစ်သော IFC EHS Guidelines (2007), IFC Guidelines on Water and Sanitation (2007), IFC Guidelines on Waste Management Facilities (2007),	- မြန်မာနိုင်ငံ မီးသတ်တပ်ဖွဲ့ ဥပဒေ၊ သဘာဝဘေးအန္တရာယ်ဆိုင်ရာ စီမံခန့်ခွဲမှု ဥပဒေ၊ ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများ အန္တရာယ်မှ တားဆီးကာကွယ်ရေး ဥပဒေများကို ထည့်သွင်းဖော်ပြရန်၊ - စီမံကိန်းမှ လိုက်နာရမည့် ဘေးအန္တရာယ် ကင်းရှင်းရေး ကိစ္စရပ်များနှင့် ပတ်သက်သည့် ဥပဒေများ၊ စည်းမျဉ်းစည်းကမ်းများ၊ သက်ဆိုင်ရာဝန်ကြီးဌာနမှ ပြဋ္ဌာန်းထုတ်ပြန်ထားသော စည်းမျဉ်းစည်းကမ်းများနှင့် ဆက်စပ်အမိန့် ကြော်ငြာစာများကို လိုက်နာမည်ဖြစ်ကြောင်း ဖော်ပြချက်နှင့် အတူထည့်သွင်း၍ ဖော်ပြရန်၊	- မြန်မာနိုင်ငံ မီးသတ်တပ်ဖွဲ့ ဥပဒေ၊ သဘာဝဘေးအန္တရာယ်ဆိုင်ရာ စီမံခန့်ခွဲမှု ဥပဒေ၊ ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများ အန္တရာယ်မှ တားဆီးကာကွယ်ရေး ဥပဒေများကို Chapter-4 (National Laws And Regulations) စာမျက်နှာ (၆၂၊၆၃၊၆၄) ထည့်သွင်းဖော်ပြထားပါသည်။ - စီမံကိန်းမှ လိုက်နာရမည့် ဘေးအန္တရာယ်ကင်းရှင်းရေး ကိစ္စရပ်များနှင့် ပတ်သက်သည့် ဥပဒေများ၊ စည်းမျဉ်းစည်းကမ်းများ၊ သက်ဆိုင်ရာဝန်ကြီးဌာနမှ ပြဋ္ဌာန်းထုတ်ပြန်ထားသော စည်းမျဉ်းစည်းကမ်းများနှင့် ဆက်စပ်အမိန့် ကြော်ငြာစာများကို လိုက်နာမည်ဖြစ်ကြောင်း စာမျက်နှာ (၆၂၊၆၃၊၆၄) တွင်ထည့်သွင်း၍ ဖော်ပြထားပါသည်။
	IFC Guidelines for Electricity Power Transmission (2007) စသည့် ပတ်ဝန်းကျင်ဆိုင်ရာ၊ လူမှုပတ်ဝန်းကျင်ဆိုင်ရာ ကိစ္စရပ်များနှင့် ပက်သက်သည့် ဥပဒေများ၊ စည်းမျဉ်းစည်းကမ်းများကို ဖော်ပြထားပြီး စာမျက်နှာ (၅၅) တွင် အဆိုပါ ဥပဒေများ စည်းမျဉ်းစည်းကမ်းများကို စီမံကိန်း ဆောင်ရွက်သူမှ လိုက်နာပါမည်ဟုဖော်ပြထားကြောင်း တွေ့ရှိရပါသည်။ - မြန်မာနိုင်ငံမီး သတ်တပ်ဖွဲ့ ဥပဒေ၊ သဘာဝဘေးအန္တရာယ်ဆိုင်ရာ စီမံခန့်ခွဲမှု ဥပဒေ၊ ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများ အန္တရာယ်မှ		

	တားဆီးကာကွယ်ရေး ဥပဒေများကိုထည့်သွင်းဖော်ပြ ထားခြင်း မရှိကြောင်း စိစစ်တွေ့ရှိရပါသည်။		
၆။	အနီးပတ်ဝန်းကျင်အကြောင်းအရာများဖော်ပြချက်		
	- စာမျက်နှာ ၃၆ တွင် Transmission Line သည် နောင်ချိုကြိုးပြင်ကာကွယ်တောနှင့် ပန်ကြူကြိုး ပြင်ကာ ကွယ်တောကို ၉.၀၇ မိုင်ခန့် ဖြတ်သွားမည်ဖြစ်ကြောင်း စိစစ်တွေ့ရှိရပါသည်။ - စီမံကိန်း၏ အနီးပတ်ဝန်း ကျင်အား ရှင်းလင်းစွာ မြင်ရသော Google Earth ပုံများ ထည့်သွင်းဖော်ပြထားခြင်းမရှိကြောင်း၊ - ကြိုးပြင်ကာ ကွယ်တောများသည် Transmission Line ၏ မည်သည့်နေရာတွင် တည်ရှိမည်ဖြစ်ကြောင်းကို ဖော်ပြထားခြင်းမရှိကြောင်း၊	- စီမံကိန်း၏ အနီးပတ်ဝန်းကျင်အား ရှင်းလင်းစွာ မြင်ရသော Google Earth ပုံများ ထည့်သွင်းဖော်ပြရန်၊ - ကြိုးပြင်ကာကွယ်တောများသည် Transmission Line ၏ မည်သည့်နေရာတွင် တည်ရှိမည်ဖြစ်ကြောင်း၊ စီမံကိန်းဖြတ်သန်းသွားမည့် ကြိုးပြင်ကာကွယ်တော၏ ဇရိယာ အကျယ်တို့အား ရေးသားဖော်ပြရန်နှင့် ၄င်းတို့၏တည်နေရာအား Google Map တွင် Google Map တွင် Coordinate Points များနှင့် တကွ WGS 84 system ဖြင့် ရှင်းလင်းစွာ ထည့်သွင်းဖော်ပြရန်၊	- စီမံကိန်း၏ အနီးဝန်ကျင်အား ရှင်းလင်းစွာ မြင်ရသော Google Earth ပုံများအား စာမျက်နှာ (၁၉၊၂၀၊၂၁၊၂၂) တွင်ဖော်ပြထားပါသည်။ - ကြိုးပြင်ကာကွယ်တောများ သည် Transmission Line စီမံကိန်းဖြတ်သန်းသွားမည့် ကြိုးပြင်ကာကွယ်တော၏ Google Earth ပုံများအား စာမျက်နှာ (၆၉၊၇၀၊၇၁)တွင်လည်းကောင်း ဇရိယာ အကျယ်နှင့် တည်နေရာအား appendix တွင် attached တွဲ၍ ဖော်ပြထားပါသည်။ - စီမံကိန်းတည်ဆောက်ရေး ကာလ၏ ရေ၊ လေ၊ ဆူညံသံနှင့် တုန်ခါမှုများ တိုင်းတာမှုရလာဒ်များအား လက်ရှိ ကနဦးပတ်ဝန်းကျင်
	- စီမံကိန်းတည်ဆောက်ရေး ကာလ၏ ရေ၊ လေ၊ ဆူညံသံနှင့် တုန်ခါမှု တိုင်းတာမှု ရလဒ်များအား ခန့်မှန်းတွက်ချက်၍ ဖော်ပြထားခြင်း မရှိကြောင်း၊ - စီမံကိန်းအနီးဝန်းကျင်ရှိကျေးရွာ၊ ရပ်ကွက်၊ မြို့များ၏ တည်နေရာနှင့် စီမံကိန်းမှအကွာအဝေးကို ဖော်ပြခြင်းမရှိကြောင်း စိစစ်တွေ့ရှိရပါသည်။	- စီမံကိန်း တည်ဆောက်ရေးကာလ၏ ရေ၊ လေ၊ ဆူညံသံနှင့် တုန်ခါမှုများ တိုင်းတာမှု ရလဒ်များအား ခန့်မှန်းတွက်ချက်၍ National EQEG နှင့် နှိုင်းယှဉ်ဖော်ပြရန်၊ - စီမံကိန်း အနီးဝန်းကျင်တွင် ကျေးရွာ၊ ရပ်ကွက်၊ မြို့များသည် စီမံကိန်းနှင့်မည်မျှဝေးကွာကြောင်း ဖော်ပြရန်၊ စီမံကိန်း အနီးဝန်းကျင်ရှိ ကျေးရွာ၊ ရပ်ကွက်၊ မြို့များ၏ တည်နေရာနှင့် လူနေအိမ်ခြေများအား၊ Google Map တွင် Coordinate Point များဖြင့် WGS 84 system နှင့် တကွ ရှင်းလင်းစွာ ဖော်ပြရန်၊	ထိခိုက်မှု ဆန်းစစ်ခြင်း အစီရင်ခံစာ approve ရရှိပြီးပါက စောင့်ကြပ်ကြည့်ရှုရေး အစီအစဉ်တွင် တိုင်းတာ လုပ်ဆောင်သွားပါမည် ဖြစ်ကြောင်းကို စာမျက်နှာ (၇၃၊၇၄) တွင် ဖော်ပြထားပါသည်။ - စီမံကိန်း အနီးဝန်းကျင်တွင် ကျေးရွာ၊ ရပ်ကွက်၊ မြို့ များသည် စီမံကိန်းနှင့် မည်မျှဝေးကွာကြောင်း ဖော်ပြရန်၊ စီမံကိန်း အနီးဝန်းကျင်ရှိ ကျေးရွာ၊ ရပ်ကွက်၊ မြို့များ၏ တည်နေရာနှင့် လူနေအိမ်ခြေများအား၊ Google Map တွင် Coordinate Point များဖြင့် WGS 84 system နှင့် တကွစာမျက်နှာ (၉၉)တွင် ဖော်ပြထားပါသည်။
၇။	စီမံကိန်းကြောင့် သက်ရောက်နိုင်မှုများနှင့် လျော့ပါးစေရေးအစီအစဉ်		

	- စာမျက်နှာ ၈၆မှ ၁၀၃ ထိ စီမံကိန်းကြောင့်သက်ရောက်နိုင်မှုများနှင့် လျော့ပါးစေရေး အစီအစဉ်များကိုဖော်ပြထားရာ - Electric and Magnetic Fields (EMF) နှင့်ပက်သက်၍ထိခိုက်နိုင်မှုများကို ဖော်ပြထားသော်လည်း လျော့ချမည့် နည်းလမ်းများကို ဖော်ပြထားခြင်းမရှိကြောင်းကို	- သစ်ပင်များခုတ်ထွင်ရှင်းလင်းမည့် အရေအတွက်၊ သစ်ပင်များ ပြန်လည်စိုက်ပျိုးမည့်အစီအစဉ်တွင် စိုက်ပျိုးမည့်တည်နေရာ၊ စိုက်ပျိုးမည့်မြေဇရိယာ ဇက စသည်တို့ကို အသေးစိတ်ဖော်ပြရန်၊ -Removal လုပ်ရာတွင် Invasive plants species များကို တတ်နိုင်သမျှ ခုတ်ထွင်ရှင်းလင်းပြီး ပြန်လည်စိုက်ပျိုးရာတွင် native plant species	- သစ်ပင်များခုတ်ထွင်ရှင်းလင်းမည့် အရေအတွက်၊ သစ်ပင်များ ပြန်လည်စိုက်ပျိုးမည့်အစီအစဉ်တွင် စိုက်ပျိုးမည့်တည်နေရာ၊ စိုက်ပျိုးမည့်မြေဇရိယာ ဇက အသေးစိတ်မှာ သစ်တောဦးစီးဌာန မှ ညွှန်ကြားချက်အတိုင်း ဆောင်ရွက်မည်ဖြစ်ကြောင်းကို စာမျက်နှာ (၁၁၂) တွင် ဖော်ပြထားပါသည်။ - Removal လုပ်ရာတွင် Invasive plants species
	"The negative health effects from electromagnetic field (EMF) radiation from the transmission line have not been established conclusively by the international medical research community" ဟုသာစိစစ်တွေ့ရှိရပါသည်။	များကိုတတ်နိုင်သမျှ ရွေးချယ်စိုက်ပျိုးရန်၊ - စီမံကိန်းသည် PPF ကို ဖြတ်သန်းသွားမည် ဖြစ်သောကြောင့် PPF အတွင်းရှိ ဇီဝမျိုးစုံမျိုးကွဲများအား ထိခိုက်မှု လျော့ပါးစေရေး ဆောင်ရွက်မည့် အစီအစဉ် အသေးစိတ်ထည့်သွင်းဖော်ပြရန်နှင့် ကာကွယ်မှုများ၊ ပြန်လည်ထိန်းသိမ်းမှုများ လုပ်ဆောင်ပေးရန်၊ - Wildlife species များ၏ breeding and nesting seasons ကို တတ်နိုင်သမျှ ရှောင်ရှား၍ တည်ဆောက်ရေး လုပ်ငန်းများကို လုပ်ဆောင်ရန်၊ - လျှပ်စစ်၊ သံလိုက်နှင့် လျှပ်စစ်သံလိုက်စက်ကွင်းများနှင့် အများပြည်သူ ထိတွေ့ခံရမှု အတွက် National EQEG တွင်ပါရှိသော သတ်မှတ်ချက်များနှင့်အညီ လိုက်နာဆောင်ရွက်ရန်၊ fuels and other hazardous materials များသုံးစွဲမည့် ပမာဏကို ဖော်ပြရန်နှင့် Storage site ၏ Design၊	များကို တတ်နိုင်သမျှ ခုတ်ထွင်ရှင်းလင်းပြီး ပြန်လည်စိုက်ပျိုးရာတွင် native plant species များကို တတ်နိုင်သမျှ ရွေးချယ်စိုက်ပျိုးမည်ဖြစ်ကြောင်းကို စာမျက်နှာ (၁၁၂)တွင် ဖော်ပြထားပါသည်။ - စီမံကိန်းသည် PPF ကို ဖြတ်သန်းသွားမည် ဖြစ်သောကြောင့် PPF အတွင်းရှိ ဇီဝမျိုးကွဲများအား ထိခိုက်မှုလျော့ပါးစေရေး ဆောင်ရွက်မည့်အစီအစဉ် အသေးစိတ်နှင့် ကာကွယ်မှုများကို သစ်တောဌာန၏ ညွှန်ကြားချက်အတိုင်း လုပ်ဆောင်မည်ဖြစ်ပါသည်။ -Wildlife species များ၏ breeding and nesting seasons ကို တတ်နိုင်သမျှ ရှောင်ရှား၍ တည်ဆောက်ရေးလုပ်ငန်းများကို လုပ်ဆောင်မည် ဖြစ်ကြောင်းကို စာမျက်နှာ (၁၁၃) တွင် ဖော်ပြထား ပါသည်။-လျှပ်စစ်၊ သံလိုက်နှင့် လျှပ်စစ်သံလိုက်စက်ကွင်း များနှင့် အများပြည်သူ ထိတွေ့ခံရမှု အတွက် National EQEG တွင်ပါရှိသော သတ်မှတ်ချက်များနှင့်အညီ လိုက်နာ ဆောင်ရွက်မည် ဖြစ်ပါသည်။

		Storage site များထားရှိမည့် တည်နေရာ၊ သိုလှောင်မည့် နည်းစနစ်တို့အား အသေးစိတ်ဖော်ပြရန် - Waste ထွက်ရှိမှုများ၊ စွန့်ပစ်မှုများနှင့် ပက်သက်၍ Waste Management Plan (WMP) ကို - ထွက်ရှိနိုင်မည့် ပမာဏ၊ အမျိုးအစား - စွန့်ပစ်မည့်နည်းလမ်း - စွန့်ပစ်မည့် နေရာ - သယ်ယူပို့ဆောင်မည့်အစီအစဉ် စသည်ဖြင့် ပြည့်စုံစွာဖော်ပြရန်၊ -Watercourse နှင့် နီးသောနေရာ များတွင် စက်ယန္တယားများ တပ်ဆင်အသုံး ပြုခြင်းကို ရှောင်ရှားရန် - Dust and noise control measure အတွက် National Environmental Quality Emission Guidelines များနှင့်အညီ လိုက်နာဆောင်ရွက်ရန်၊ - ညစ်ညမ်းရေ စီးဆင်းမှုအတွက် National EQEG ၏ စာပိုဒ် (၂.၁.၁၀) ပါ သတ်မှတ်ထားသော Effluents Levels များအတိုင်း လိုက်နာဆောင်ရွက်ရန်၊ - Soil Erosion Impact အား Mitigation ပြုလုပ်မည့် အချက်များအတိုင်း အတိအကျလိုက်နာဆောင်ရွက်ရန်၊ - Traffic Management and Construction Safety နှင့် ပက်သက်၍ Traffic Management Plan ရေးဆွဲ၍	- fuels and other hazardous materials များသုံးစွဲမည့် ပမာဏကို ဖော်ပြရန်နှင့် Storage site ၏ Design၊ Storage site များထားရှိမည့်တည်နေရာ၊ သိုလှောင်မည့် နည်းစနစ် တို့အား စာမျက်နှာ (၁၁၄) တွင်ဖော်ပြထားပါသည်။ - Waste ထွက်ရှိမှုများ၊ စွန့်ပစ်မှုများနှင့် ပက်သက်၍ Waste Management Plan (WMP) ကို - ထွက်ရှိ နိုင်မည့်ပမာဏ၊ အမျိုးအစား - စွန့်ပစ်မည့်နည်းလမ်း - စွန့်ပစ်မည့်နေရာ - သယ်ယူ ပို့ဆောင်မည့် အစီအစဉ်များ ကို စာမျက်နှာ (၂၅) တွင် ဖော်ပြထားပါသည်။ - Watercourse နှင့် နီးသော နေရာများတွင် စက်ယန္တယားများ တပ်ဆင် အသုံးပြုခြင်းကို ရှောင်ရှား သွားမည်ဖြစ်ပါသည်။ - Dust and noise control measure အတွက် National Environmental Quality Emission Guidelines များနှင့် အညီ လိုက်နာဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။ - ညစ်ညမ်းရေ စီးဆင်းမှုအတွက် National EQEG ၏ စာပိုဒ် (၂.၁.၁၀) ပါ သတ်မှတ် ထားသော Effluents Levels များအတိုင်း လိုက်နာဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။
		အကောင်အထည်ဖော်ဆောင်ရွက်သွားရန်၊ - Construction Camp ပတ်ဝန်းကျင်၌ Health and Sanitation Facilities များအား စနစ်တကျ တည်ဆောက်ရန်နှင့် တည်ဆောက်မည့် ဒီဇိုင်းပုံစံများနှင့် ပက်သက်၍ ထည့်သွင်းဖော်ပြရန်၊ ဒေသခံပြည်သူများ အတွက် လျှပ်စစ်ဘေးအန္တရာယ်ဆိုင်ရာ အသိပညာပေး ဟောပြောပွဲများ မဖြစ်မနေ လုပ်ဆောင်ပေးရန်နှင့်	- Traffic Management and Construction Safety နှင့် ပက်သက်၍ Traffic Management Plan ရေးဆွဲ၍ အကောင်အထည်ဖော် ဆောင်ရွက်သွားရန် စာမျက်နှာ (၁၁၆) တွင်ဖော်ပြထားပါသည်။ - Construction Camp ပတ်ဝန်းကျင်၌ Heallth and Sanitation Facilities များအား စနစ်တကျ တည်ဆောက်ရန်နှင့် တည်ဆောက်မည့် ဒီဇိုင်းပုံစံများနှင့် ပက်သက်၍

		လုပ်ဆောင်မည့်အစီအစဉ်များအား ထည့်သွင်းဖော်ပြရန်၊ - SOx, NOx များသည် GHG အမျိုးအစား Gas ဖြစ်သောကြောင့် စီမံကိန်းတစ်ခုလုံးမှ ၄င်းတို့ထွက်ရှိမှုကို ခန့်မှန်းတွက်ချက်ဖော်ပြပြီး အနီးပတ်ဝန်းကျင်ရှိ သက်ရှိများနှင့် အလုပ်သမားများအပေါ် သက်ရောက် သည့် အဆင့်အနည်းဆုံးဖြစ်အောင် ဆောင်ရွက်ရန်၊ - Table 6.1 တွင်ဖော်ပြထားသော ထိခိုက်မှု လျော့ပါးစေရေး ဆောင်ရွက်မည့်အစီအစဉ်များအတိုင်း အကောင်အထည်ဖော် ဆောင်ရွက်သွားရန်၊	ထည့်သွင်းဖော်ပြရန်၊ Table 2.1, 2.2, 2.3စာမျက်နှာ (၂၄၊ ၂၅၊ ၃၀-၃၅) တွင် ဖော်ပြထားပါသည်။ - ဒေသခံပြည်သူများအတွက် လျှပ်စစ်ဘေးအန္တရာယ်ဆိုင်ရာ အသိပညာပေး ဟောပြောပွဲများ မဖြစ်မနေ လုပ်ဆောင်ပေးရန်နှင့် လုပ်ဆောင်မည့်အစီအစဉ်များအား ထည့်သွင်းဖော်ပြရန်၊ - SOx, NOx များသည် GHG အမျိုးအစား Gas ဖြစ်သောကြောင့် စီမံကိန်းတစ်ခုလုံးမှ ၄င်းတို့ထွက်ရှိမှုကို ခန့်မှန်းတွက်ချက်ဖော်ပြပြီး အနီးပတ်ဝန်းကျင်ရှိ သက်ရှိများနှင့် အလုပ်သမားများအပေါ်သက်ရောက်သည့် အဆင့်အနည်းဆုံးဖြစ်အောင် ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။ - Table 6.1 စာမျက်နှာ ၁၀၀ တွင် ဖော်ပြ ထားသော ထိခိုက်မှု လျော့ပါးစေရေး ဆောင်ရွက်မည့် အစီအစဉ်များအတိုင်း အကောင်အထည်ဖော် ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။
၈။	အခြားနည်းလမ်းများရွေးချယ်ခြင်း		
	- စီမံကိန်း၏ Analysis of Alternative စီမံကိန်းအား ရွေးချယ်ရသည့် အကြောင်းအရင်း စီမံကိန်းအားအခြားနည်းလမ်းရွေးချယ်မည်ဆိုပါက ဖြစ်ပေါ်လာမည့် impacts များကို ဆန်းစစ်၍ ဖော်ပြထားခြင်းမရှိကြောင်း စိစစ်တွေ့ရှိရသည်။	- စီမံကိန်း၏ Analysis of Alternative စီမံကိန်းအား ရွေးချယ်ရသည့် အကြောင်းအရင်း စီမံကိန်းအားအခြားနည်းလမ်းရွေးချယ်မည်ဆိုပါက ဖြစ်ပေါ်လာမည့် impacts များကို ဆန်းစစ်ဖော်ပြရန်	Alternative E Guard
၉။	နစ်နာသူမှတိုင်ကြားလာသည့်အပေါ် တာဝန်ယူ ဆောင်ရွက်ပေးမည့် အစီအစဉ် (Grievance Redress Mechanism - (GRM)		
	စာမျက်နှာ (၉၈ - ၁၀၁) တွင် နစ်နာသူမှ တိုင်ကြားလာသည့်အပေါ် တာဝန်ယူ ဆောင်ရွက်ပေးမည့် အစီအစဉ်နှင့် ပက်သက်၍ GRM Process အား စာမျက်နှာ ၁၃၆ တွင် ဖော်ပြထားသည်ကို စိစစ်တွေ့ရှိရပါသည်။		
၁၀။	ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်		

	စာမျက်နှာ (၁၁၅ - ၁၃၇) တွင် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်အား Design Phase, Construction Phase နှင့် Operation Phase တို့တွင် ဖြစ်ပေါ်မည့် ထိခိုက်မှုများကို လျော့ချမည့် အစီအစဉ်များနှင့် စောင့်ကြပ်ကြည့်ရှုမည့် အစီအစဉ်များအား ဖော်ပြ ထားပါသည်။ ထိခိုက်မှုလျော့ချခြင်းနှင့် စောင့်ကြပ် ကြည့်ရှုခြင်းအတွက် ရန်ပုံငွေ လျာထားချက်များ ဖော်ပြထားကြောင်း၊ Occupational and Community Health and Safety, Emergency Preparedness and Response Plan, Corporate Social Responsibility Plan များကို ထည့်သွင်းဖော်ပြ ထားကြောင်း တွေ့ရှိရသည်။	- Table 8.1 EMP တွင် ဖော်ပြထားသော အစီအစဉ်များ အတိုင်း စနစ်တကျလိုက်နာလုပ်ဆောင်သွားရန်၊ - Table 8.2 တွင် ဖော်ပြထားသော စောင့်ကြပ်ကြည့်ရှုရမည့် အစီအစဉ်များအတိုင်း လိုက်နာလုပ်ဆောင်ရန်နှင့် ထပ်မံ၍လုပ်ဆောင်မည့် အစီအစဉ်များရှိပါက ထည့်သွင်း ဖော်ပြရန်၊ - Emergency Management Plan တွင် ပါဝင်သည့် oil spill response plan နှင့် Fire Fighting တွင် ဖော်ပြထားသော အစီအစဉ်များအတိုင်း အသေးစိတ် လိုက်နာဆောင်ရွက်ရန် - Occupational and Community Health and safety Plan အရ အလုပ်သမားများနှင့် ဒေသခံပြည်သူများ၏ ဘေးအန္တရာယ် ကင်းရှင်းရေးအတွက် အထူးအလေးထား ဆောင်ရွက် သွားရန်၊	- Table 8.1 EMP စာမျက်နှာ ၁၁၉ တွင် ဖော်ပြထား သော အစီအစဉ်များ အတိုင်း စနစ်တကျ လိုက်နာ လုပ်ဆောင် သွားမည် ဖြစ်ပါသည်။ - Table 8.2 စာမျက်နှာ ၁၂၉ တွင် ဖော်ပြထားသော စောင့်ကြပ် ကြည့်ရှုရမည့် အစီအစဉ်များ အတိုင်း လိုက်နာ လုပ်ဆောင်သွားမည်ဖြစ်ပါသည်။ - Emergency Management Plan တွင် ပါဝင်သည့် oil spill response plan နှင့် Fire Fighting တွင် ဖော်ပြ ထားသော အစီအစဉ်များအတိုင်း အသေးစိတ် လိုက်နာ ဆောင်ရွက် သွားမည် ဖြစ်ပါသည်။ - Occupational and Community Health and safety Plan အရ အလုပ်သမားများနှင့် ဒေသခံပြည်သူများ၏ ဘေးအန္တရာယ်ကင်းရှင်းရေးအတွက် အထူးအလေးထား ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။
၁၁။	အများပြည်သူနှင့် တွေ့ဆုံဆွေးနွေးခြင်းနှင့် သတင်းအချက်အလက်ထုတ်ဖော်ခြင်း		
	စာမျက်နှာ (၁၀၄ - ၁၁၃) တွင် အများပြည်သူနှင့် တွေ့ဆုံဆွေးနွေးခြင်းနှင့် ပက်သက်၍ အစိုးရအဖွဲ့အစည်းများ၊ ဒေသခံပြည်သူများနှင့် တွေ့ဆုံဆွေးနွေးမှုများတွင် တက်ရောက်ခဲ့သည့် လူဦးရေစာရင်းများ ဆွေးနွေးရာမှ တွေ့ဆုံဆွေးနွေးမှု	- တွေ့ဆုံဆွေးနွေးမှုဌ Stakeholder များမှ အကြံပြုချက်၊ တောင်းဆိုချက်များကို အကောင်အထည်ဖော် ဆောင်ရွက်ပေးမည်ဖြစ်ကြောင်း၊ ဆောင်ရွက်ပြီးစီးမှုအခြေအနေနှင့် ထပ်မံဆောင်ရွက်ပေး မည့် အစီအစဉ်များအား ထည့်သွင်းဖော်ပြရန်၊	- တွေ့ဆုံဆွေးနွေးမှုဌ Stakeholder များမှ အကြံပြုချက်၊ တောင်းဆိုချက်များကို အကောင်အထည်ဖော် ဆောင်ရွက်ပေးမည် ဖြစ်ကြောင်း၊ ဆောင်ရွက်ပြီးစီးမှု အခြေအနေနှင့် ထပ်မံဆောင်ရွက်ပေးမည့် အစီအစဉ် များအား စာမျက်နှာ (၁၁၃) တွင်
၁၂။	အထွေထွေ		
	- IEE အစီအရင်ခံစာပြန်လည်ပြင်ဆင်မည့် တတိယအဖွဲ့အစည်းတွင် Waste Management, Electric and Magnetic Field (EMP) Risk Assessment and Hazard Management နယ်ပယ်ဆိုင်ရာ ကျွမ်းကျင်ပညာရှင်များ ထပ်မံဖြည့်စွက်၍ ၄င်းတို့၏ CV Form, ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းဆိုင်ရာ အတွေ့အကြုံ၊ ပညာအရည်အချင်းနှင့်တကွ ဖြည့်စွက်တင်ပြရန်၊ - ပြန်လည်ရေးဆွဲမည့် IEE အစီရင်ခံစာတွင် အခုပေးပို့သော အကြံပြုချက်တစ်ခုချင်းစီအား ဖြေရှင်းစဉ်းစား၍ အစီရင်ခံစာ၏ မည်သည့်အပိုင်းတွင်ရေးသားထားသည်ကို ဖော်ပြသည့် (Comment Respond Table) ကို အခန်းတစ်ခုအနေဖြင့် ရေးဆွဲရန်၊ -ပြန်လည်ရေးဆွဲတင်ပြသည့် အစရင်ခံစာအား Soft Copy တစ်စုံ ပူးတွဲပေးပို့တင်ပြရန်၊		

		- IEE အစီရင်ခံစာပြန်လည်ပြင်ဆင်မည့် တတိယအဖွဲ့အစည်းတွင် Waste Management, Electric and Magnetic Field (EMP) Risk Assessment and Hazard Management နယ်ပယ်ဆိုင်ရာ ကျွမ်းကျင် ပညာရှင်များ ထပ်မံဖြည့်စွက်၍ ၄င်းတို့၏ CV Form, ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းဆိုင်ရာ အတွေ့အကြုံ၊ ပညာအရည်အချင်းနှင့်တကွ ဖြည့်စွက်တင်ပြရန်၊ - ပြန်လည်ရေးဆွဲမည့် IEE အစီရင်ခံစာတွင် အခု ပေးပို့သော အကြံပြုချက်တစ်ခုချင်းစီအား ဖြေရှင်းစဉ်းစား၍ အစီရင်ခံစာ၏ မည်သည့်အပိုင်းတွင် ရေးသားထားသည်ကို ဖော်ပြသည့် (Comment Respond Table) ကို အခန်းတစ်ခုအနေဖြင့် ရေးဆွဲရန်၊ -ပြန်လည်ရေးဆွဲတင်ပြသည့် အစရင်ခံစာအား Soft Copy တစ်စုံ ပူးတွဲပေးပို့တင်ပြရန်၊	- IEE အစီရင်ခံစာပြန်လည်ပြင်ဆင်မည့် တတိယအဖွဲ့အစည်းတွင် Waste Management, Electric and Magnetic Field (EMP) Risk Assessment and Hazard Management နယ်ပယ်ဆိုင်ရာ ကျွမ်းကျင်ပညာရှင်များ ထပ်မံဖြည့်စွက်၍ ၄င်းတို့၏ CV Form, ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းဆိုင်ရာအတွေ့အကြုံ၊ ပညာအရည်အချင်းများကို Appendix တွင် attached တွဲ၍ ထည့်သွင်းဖော်ပြထားပါသည်။