CHAPTER 5: EXISTING PHYSICAL ENVIRONMENT

5.1 INTRODUCTION

This Chapter provides a description of the current baseline conditions in the Project impact zone and area of influence as described in **Chapter 3, Section 3.6**. Baseline environmental status outlines the prevailing environment conditions of the project area. The baseline characteristics of the biophysical conditions are used as the basis of prediction of possible effects and also to monitor changes during construction and operation.

5.2 APPROACH AND METHODOLOGY

5.2.1 Review of Project Information and Data Collection

To plan the fieldwork and survey, maps of the Project impact zone were created and the key environmental and social resources were located and analysed. Before fieldwork and survey, literature review was undertaken mostly based on existing secondary information (published reports, maps, topographic sheets, satellite images, etc.). This analysis was used to develop the survey plan and target locations.

In addition, relevant secondary data that supplements the understanding of the existing physical, social and biological environments have been collected and reviewed. These include data from NREB, DOE, District Offices (DO), Department of Agriculture (DOA), Forest Department Sarawak (FDS), JBALB and Malaysian Meteorological Service Department (MMSD).

5.2.2 Study Area, Fieldwork and Survey

Field survey and environmental baseline sampling were conducted over several periods from October 2020 to February 2021. Planned trips were postponed several times due to Covid-19 outbreak and imposition of Conditional Movement Control Order (CMCO) and Movement Control Order (MCO) by the Sarawak State Disaster Management Committee (SDMC). The following summarised the field surveys undertaken:

Date / Period	Activities
20 – 23 Oct 20	Site reconnaissance and river water sampling.
3 Nov 2020	Stakeholder engagement in Kanowit District.
1– 11 Dec 2020	Environmental baseline sampling and data collection for air, noise, traffic and EMF.
15 – 21 Dec 20	Continue and completed remaining environmental baseline sampling and data collection for air, noise, traffic and EMF.

5.2.3 Limitations

There remain some areas that faced limitations during the process of data collection due to data availability at time of the survey and/or inexistence of detailed data from official sources. This limitation is as follows:

- Project design information, although available at the time of writing, is subject to changes resulting from the on-going centre line survey. The current project design with respect to the proposed transmission line route is based on Route Option 2 which have been selected to minimize displacement of physical structures and titled land lots as much as possible. Specific information related to land ownership status, crops affected, specific resource uses is not available at the time of report writing.

5.3 CLIMATE

5.3.1 Climate and Climate Change

Meteorological data were acquired from the nearest meteorological station operated by the MMSD located in Kapit (2° 0'0.1"N, 112°55'31.00"E), the capital of Kapit Division, on the southern bank of Btg. Rajang.

The meteorological data recorded include rainfall, surface air temperature and relative humidity and temperature. The acquired data cover a period of 13 years from 2007 to 2019.

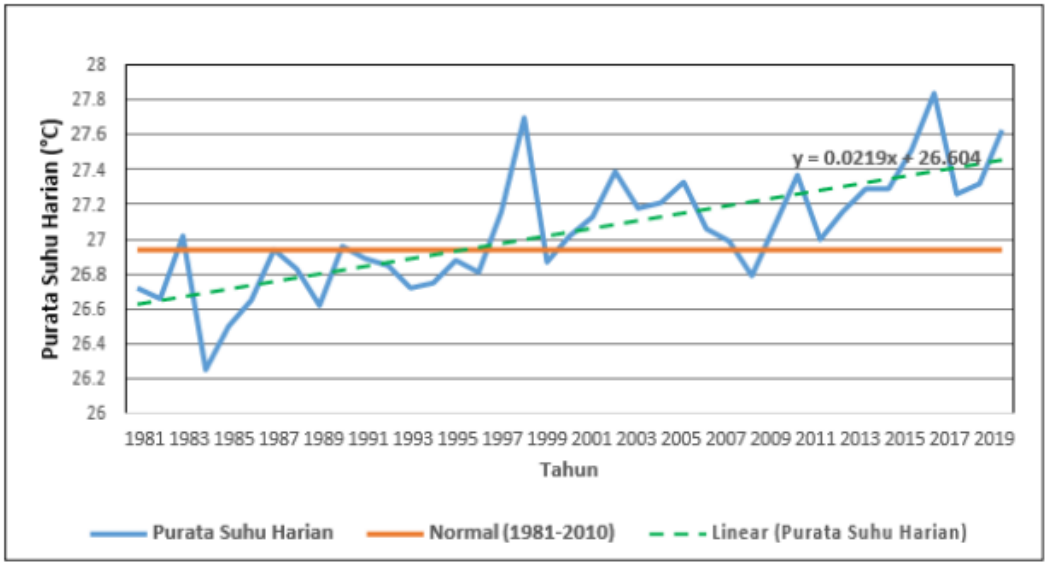
In general, the proposed Project site is subjected to an equatorial type of climate consistent with the rest of the State, characterised by hot and humid weather all year round. It is under the influence of the Asian monsoon system. There are two distinct monsoon regimes:

1. Northeast Monsoon from November to March (wet season)
2. Southwest Monsoon from May to September (dry season).

The period between the monsoons is commonly referred to as the inter-monsoon or transition period.

As elsewhere in the world, climate change has its effects in Malaysia with raising temperatures.

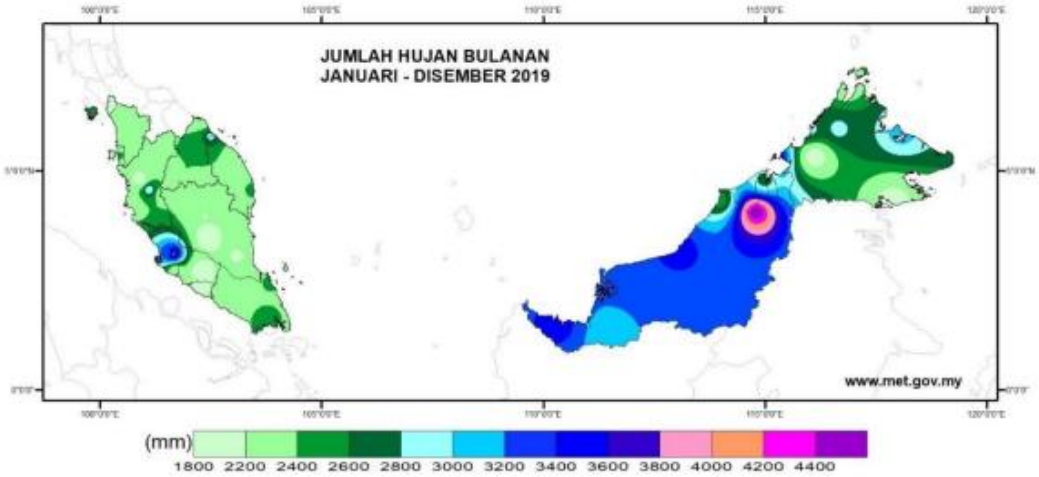
The average temperature for 2019 was 27.63 ° C, was 0.69°C above normal. The normal temperature for Malaysia is 26.94°C. The average maximum temperature of 2019 was around 32.67°C, which was 0.71°C above normal while the average minimum temperature of 2019 is 24.24°C, which was 0.66°C above normal. This average temperature generally indicates an increasing trend compared to normal.



Source: (Figure and associated text): Meteorological Department Malaysia, Annual Report 2019)

Figure 5.3.1: Average Daily Temperature in Malaysia Compared to Normal (1981-2010)

In 2019, the highest total rainfall recorded in Sarawak was between 3200 mm and 4600 mm.



Source: (Figure and associated text): Meteorological Department Malaysia, Annual Report 2019)

Figure 5.3.2: Total Annual Rainfall for 2019

In addition to the generally rising temperatures and rainfall, extreme events such as heat waves and storms are also increasing in frequency.

These effects of climate change will be included in the design of the transmission line. The temperatures will have an effect on material choice and calculations of necessary slack of the lines during the warmest periods while the heavy rainfall that may be expected in the project area will place emphasis on slope stabilisation since the line mostly will be built mid-slope.

5.3.2 Temperature

The monthly 24-hr mean temperature in Kapit over 13 years are shown in **Figure 5.3.3** and **Table 5.3.1**. 24-hr mean temperatures fluctuate in a small range between 26.4°C to 27.4°C with long term mean of 26.9°C.

Mean daily maximum temperatures range between 31.8°C and 33.2°C with the highest temperatures occurring in May, July and August.

Mean daily minimum temperatures range between 23.5°C and 24.1°C with the lowest temperatures occurring in July, August and September.

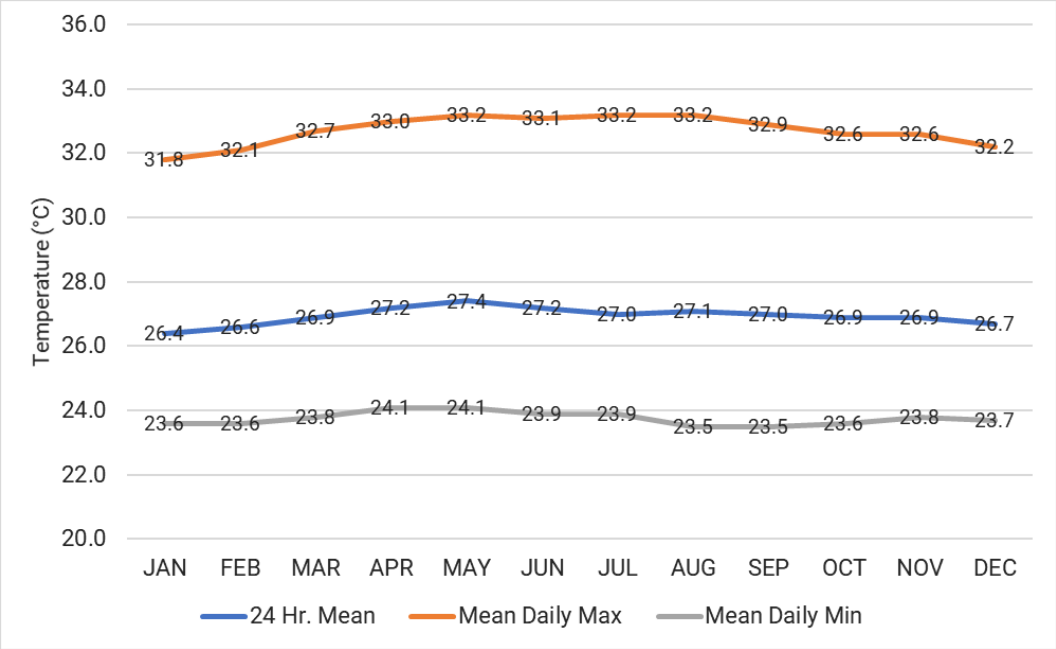


Figure 5.3.3: 24-hr Mean, Maximum and Minimum Temperature (2007-2019)

The highest maximum temperature recorded was 37.6°C in the year of 2019 while the lowest minimum temperature recorded was 20.7°C in the year of 2014 and 2019 respectively.

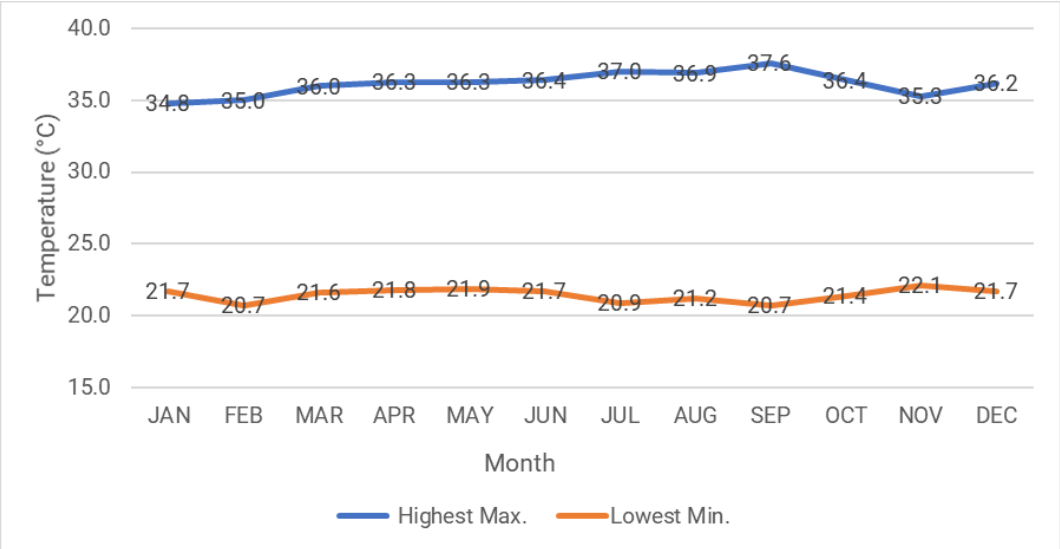


Figure 5.3.4: Highest Maximum and Lowest Minimum Temperature (2007-2019)

5.3.3 Relative Humidity

The relative humidity in Kapit for the last 13 years (2007-2019) is portrayed in **Figure 5.3.5** and **Table 5.3.1** and shows the following features:

- The annual 24 Hr. mean relative humidity was recorded as 85.7%. It fluctuates in a narrow range between 84.6% to 87.2%.
- The highest relative humidity recorded was 87.2% in January while the lowest relative humidity recorded was in August (84.6).

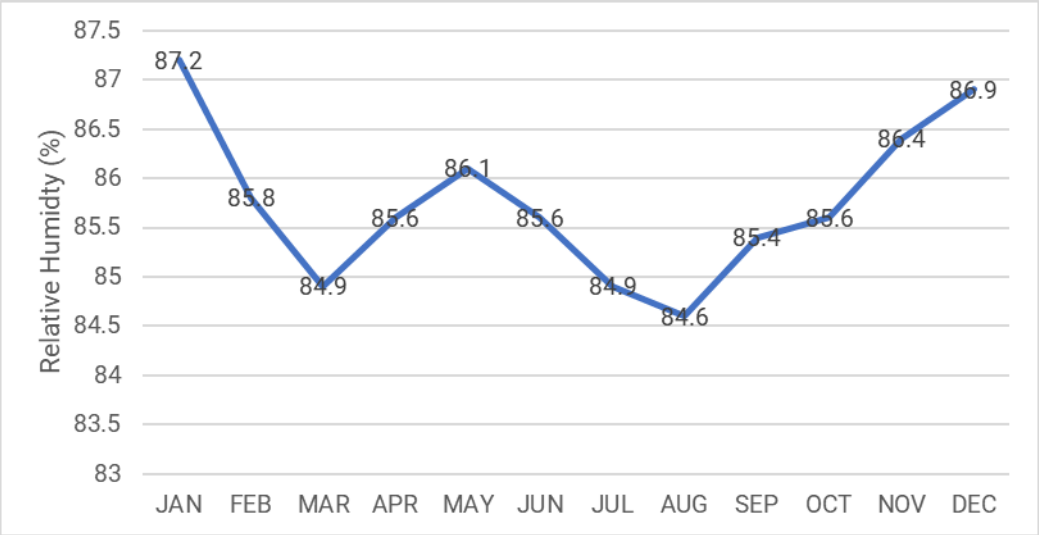


Figure 5.3.5: 24-hr Mean Relative Humidity, Kapit

5.3.4 Rainfall and Rain Days

Like the rest of the State, Kapit region generally has rainfall all year round. However, there are fluctuations from year to year with total annual rainfall fluctuating between 3,144 mm and 4,994.8 mm.

The monthly mean, highest and lowest monthly rainfall for the period of 2007 to 2019 presented on **Figure 5.3.6** and **Table 5.3.2** show the following:

- The wettest months are during the 'landas season' (rainy season), i.e., the Northeast Monsoon from November to March, when about 50% of the mean annual rain falls.
- A drier period occurs during the Southwest Monsoon period from April to July since the south-westerly wind does not carry much moisture from the mainland.

- The year that recorded the highest and lowest rainfall was in 2010 and 2019 respectively. The highest number of rain days was 272 days and the lowest number of rain days was 214 days.

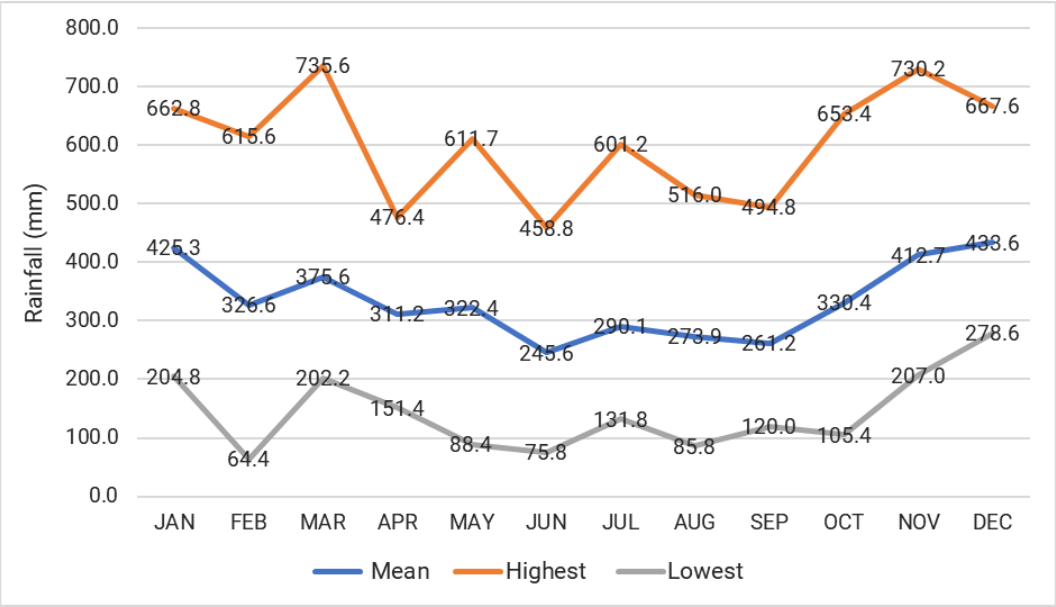
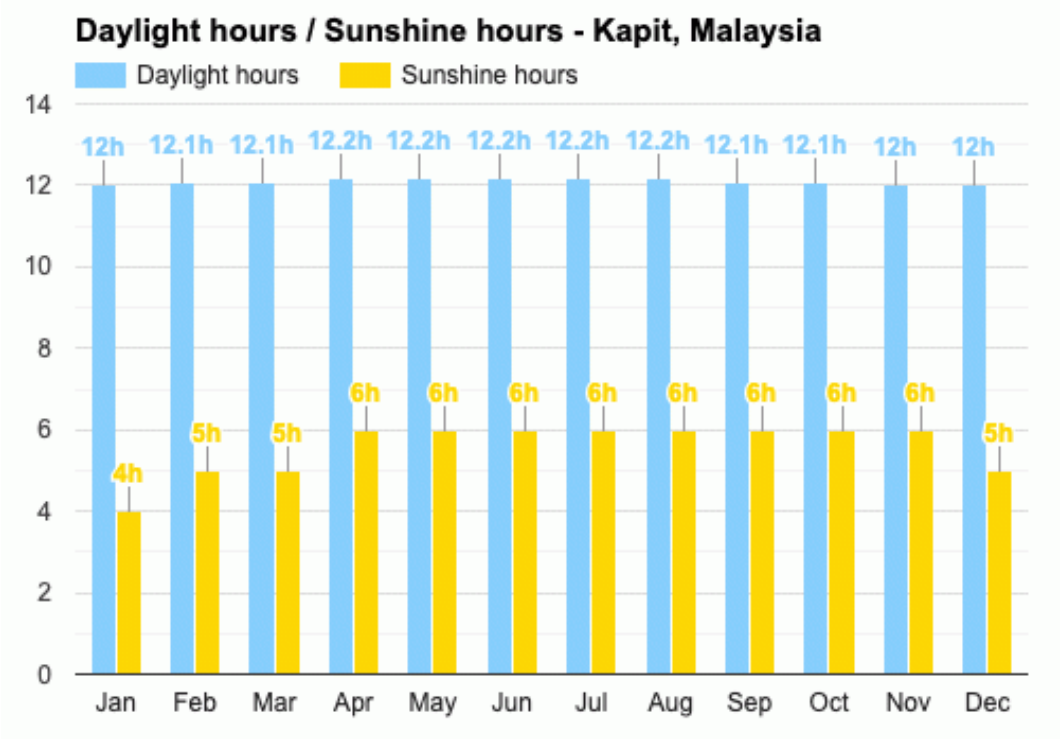


Figure 5.3.6: Summary of Mean, Highest and Lowest Monthly Rainfall (2007-2019)

5.3.5 Sunshine

Based on data obtained from Weather Atlas, Kapit average daily sunshine duration is 6 hours. Months with most sunshine are April, May, June, July, August, September, October and November. The month with least sunshine is January (Average sunshine: 4h).

In the presence of significant cloud cover during the Northeast Monsoon (Nov-Mar), the daily sunshine hours will be reduced to an approximate average of 5 hours. In general, maximum sunshine is evident between the hours of 0830 to 1400.



Source: https://www.weather-my.com/en/malaysia/kapit-climate, 2020

Figure 5.3.7: Daylight Hours/Sunshine Hours – Kapit

Table 5.3.1: Records of Temperature and Relative Humidity

Station: Kapit

Latitude: 2° 00′ 1″ N

Longitude: 112° 55′ 31″ E

Ht above M.S.L: 35.00 m

Period	No. of Years	Temperature (°C)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2007 - 2019	13	24 Hr. Mean	26.4	26.6	26.9	27.2	27.4	27.2	27.0	27.1	27.0	26.9	26.9	26.7	26.9
		Mean Daily Max.	31.8	32.1	32.7	33.0	33.2	33.1	33.2	33.2	32.9	32.8	32.6	32.2	32.7
		Mean Daily Min.	23.6	23.6	23.8	24.1	24.1	23.9	23.5	23.5	23.5	23.6	23.8	23.7	23.7
		Highest Max.	34.8	35.0	36.0	36.3	36.3	36.4	37.0	36.9	37.6	36.4	35.3	36.2	37.6
		Year of Highest Max.	2019	2010	2019	2016	2014	2012 2013	2018	2018 2019	2019	2016	2019	2015	2019
		Lowest Min.	21.7	20.7	21.6	21.8	21.9	21.7	20.9	21.2	20.7	21.4	22.1	21.7	20.7
		Year of Lowest Min.	2015	2014	2011	2008	2008	2008	2009 2013	2014	2019	2011	2008	2011	2014 2019
2007-2019	13	24 Hr. Mean RH (%)	87.2	85.8	84.9	85.6	86.1	85.6	84.9	84.6	85.4	85.6	86.4	86.9	85.7

Source: Malaysian Meteorological Department, Kapit, 2020

Table 5.3.2: Records of Mean, Highest, Lowest of Monthly and Annual Rainfall and Raindays, Kapit 2007-2019

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Rainfall (mm)													
Mean	425.3	326.6	375.6	311.2	322.4	245.6	290.1	273.9	261.2	330.4	412.7	433.6	3975.8
Highest	662.8	615.6	735.6	476.4	611.7	458.8	601.2	516.0	494.8	653.4	730.2	667.6	4994.8
Year of Highest	2009	2013	2008	2007	2018	2010	2010	2017	2017	2018	2017	2018	2010
Lowest	204.8	64.4	202.2	151.4	88.4	75.8	131.8	85.8	120.0	105.4	207.0	278.6	3144.0
Year of Lowest	2012	2007	2019	2016	2012	2012	2015	2015	2012	2013	2016	2016	2019
Number of Raindays													
Mean	25	19	21	20	20	16	17	18	18	23	24	25	246
Highest	30	26	26	27	24	24	25	27	24	26	26	28	272
Year of Highest	2009	2013	2008	2010	2016 2013 2011	2007	2010	2014	2017 2010	2018 2011	2008 2015 2017 2009 2013	2013 2018 2008	2010
Lowest	22	3	15	15	14	11	12	11	12	16	20	19	214
Year of Lowest	2017 2010	2007	2019	2014	2008	2009 2013	2014 2018	2019	2019	2013	2016 2019	2015	2007

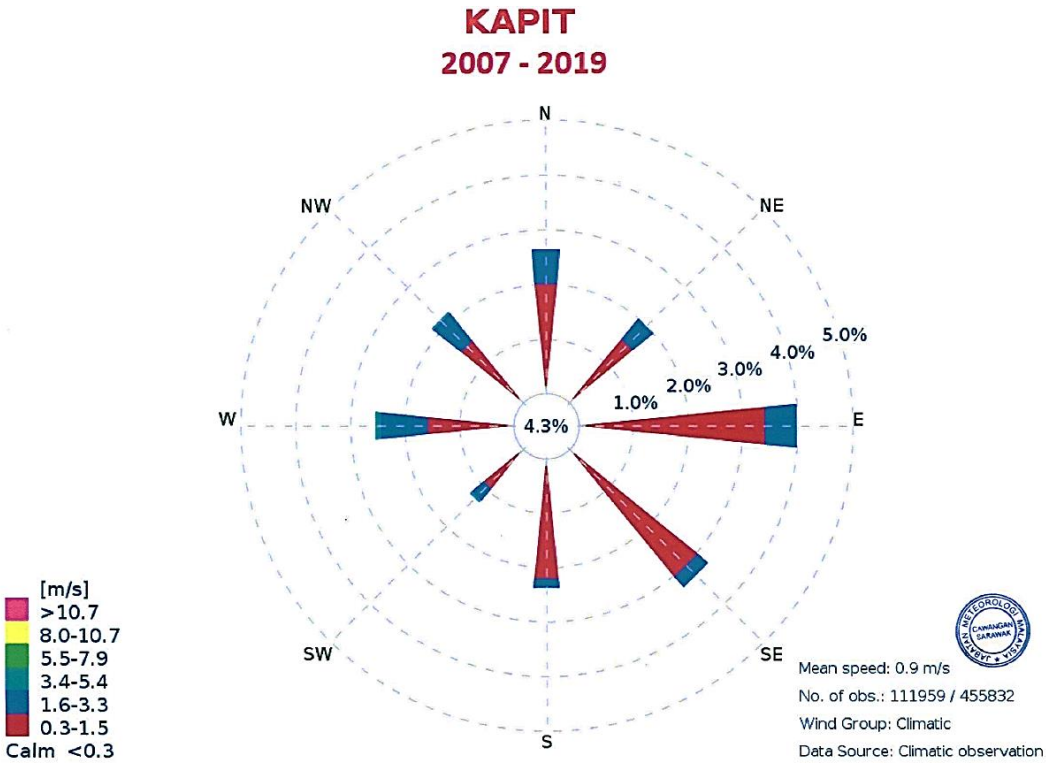
Source: Malaysian Meteorological Department, Kapit, 2020

5.3.6 Surface Wind

Annually, Kapit experiences 4.3% calm wind. The mean surface wind speed observed for the last 13 years was consistent at 0.9 m/s or 3.24 km/hr, which is interpreted as light wind. It was observed that the wind flow patterns were uniform throughout this duration. Wind speed ranges from 0.9 to 1.5 m/s (3.24 to 5.4 km/hr.), and rarely exceed 5.0 m/s (18 km/hr; gentle wind). The moderation effect of dense surface vegetation that largely covers the ground surfaces of Kapit Division is the likely reason for the low average wind speed.

Wind directions are pre-dominantly easterly/south easterly throughout the year, even during the Northeast monsoon period (Nov. – March) and Southwest monsoon (May – Sept), with wind speed of up to 3.3 m/s.

The annual and seasonal wind rose summaries are presented in **Figure 5.3.8** and **Figure 5.3.9**.



Source: Jabatan Meteorologi Malaysia, 2020

Figure 5.3.8: Annual Wind Rose Summary

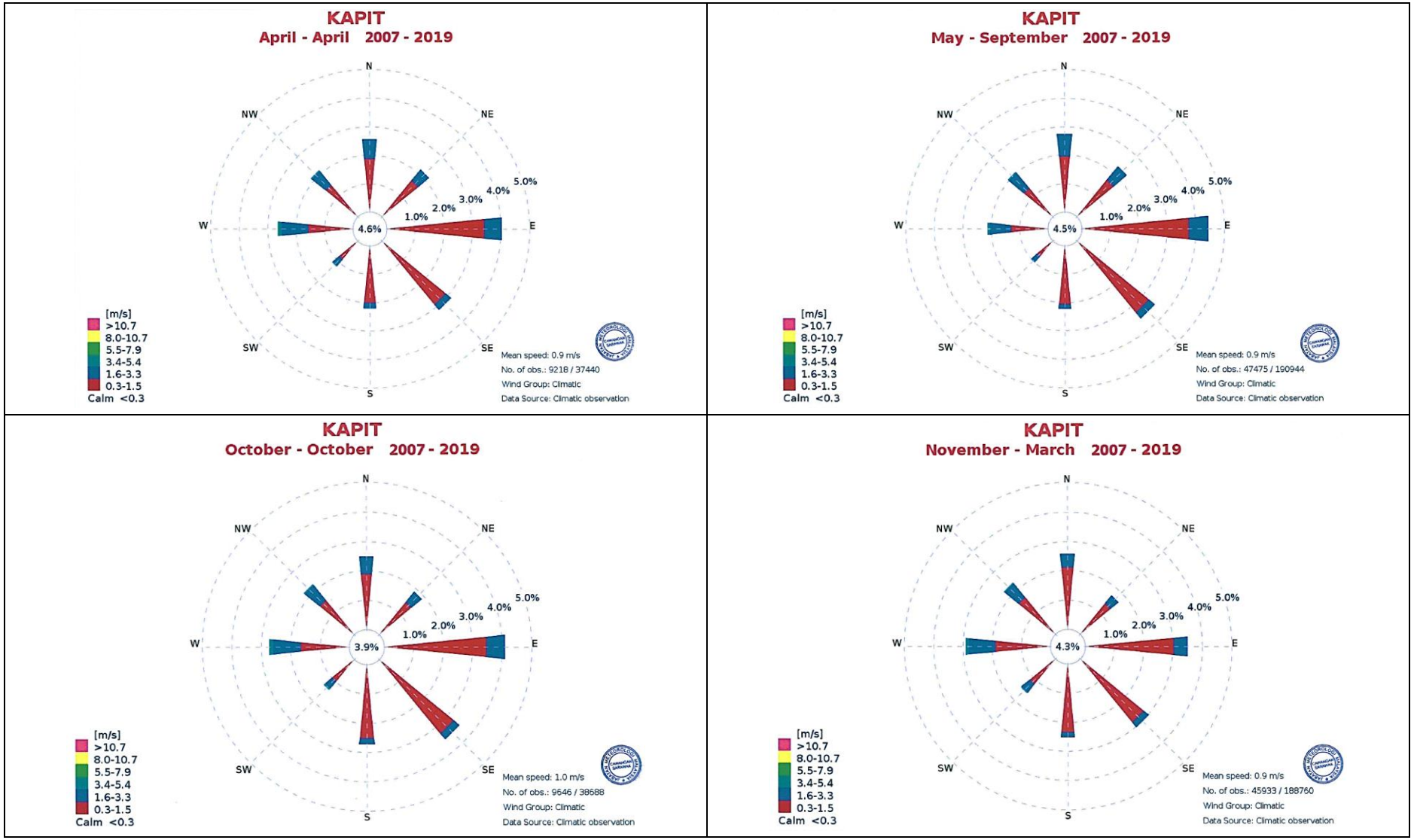


Figure 5.3.9: Seasonal Wind Rose Summary

5.4 TOPOGRAPHY

The topographical characteristics of the transmission line route are interpreted from the contour lines of the Malaysia Sarawak 1:50,000 topographic map. The elevation map along the entire transmission line route alignment is shown in **Figure 5.4.1 (a) to (h)**.

Generally, the topography in these areas consist of hilly, mountainous, ridges, valleys and plateaus. The elevation is at its highest at Baleh area and slowly reduced as the proposed transmission line travels westwards towards Mapai. The topography is generally flat land at the ending chainage of the proposed ROW.

The starting point at Baleh HEP, approximately 105 km upstream of Kapit Town is characterised by elevation ranging between 60 m to 780 m. This area is mainly hilly with gentle to steep slope. As the transmission line travels downstream along Btg. Baleh, the elevation ranges from 60 m to 560 m. Most of the hilly terrain in this stretch consist of gentle slope. Further downstream at Kapit area, the elevation along the proposed ROW ranges from 40 m to 280 m. This stretch is mainly flat with some hilly terrain with gentle slope. For Song area, the elevation ranges from 20 m to 220 m. At Kanowit area, approaching the Mapai substation area, the elevation ranges from 20 m to 180 m. Majority of this stretch is flat land with some small hills.

Slope identified along the transmission line ROW route of 50 m, is categorised into four (4) categories, namely Class I: slope with less than 15-degree slope gradient; Class II: slope between 15- and 25-degree slope gradient; Class III: slope between 25- and 35-degree slope gradient; and Class IV: slope with 35-degree and above slope gradient. The different categories of slope in degrees were plotted for the Project area, as shown in **Figure 5.4.2(a)** to **(h)**.

Slope of Class I, slope with less than 15-degree slope gradient, along the 50 m transmission line ROW, covers an area of 515. 83 ha (58.71%); slope of Class II, slope between 15- and 25-degree slope gradient, covers an area of 241.58 ha (27.50%); slope of Class III, slope between 25- and 35-degree slope gradient, covers an area of 100.90 ha (11.49%); slope of Class IV, slope with 35-degree and above slope gradient, covers an area of 20.24 ha (2.30%). The slope classification within the ROW is as shown in **Table 5.4.1**.

Table 5.4.1: Slope Classification within ROW

Class	Slope Gradient	Area (ha., est.)	Percentage
Class I	< 15°	515.829	58.71
Class II	≥ 15° – < 25°	241.582	27.50
Class III	≥ 25° – < 35°	100.901	11.49
Class IV	≥ 35°	20.239	2.30
Total		**878.551**	**100**

Slope of Class IV and Class III are mostly identified in Baleh area, from AT1 to AT13; going downstream along Btg. Baleh and Btg. Rajang, majority of the slope identified are from Class II and Class III, from AT14 to AT27; slope of Class I and Class II covers most of the area at the Mapai area, from AT28 to AT35.

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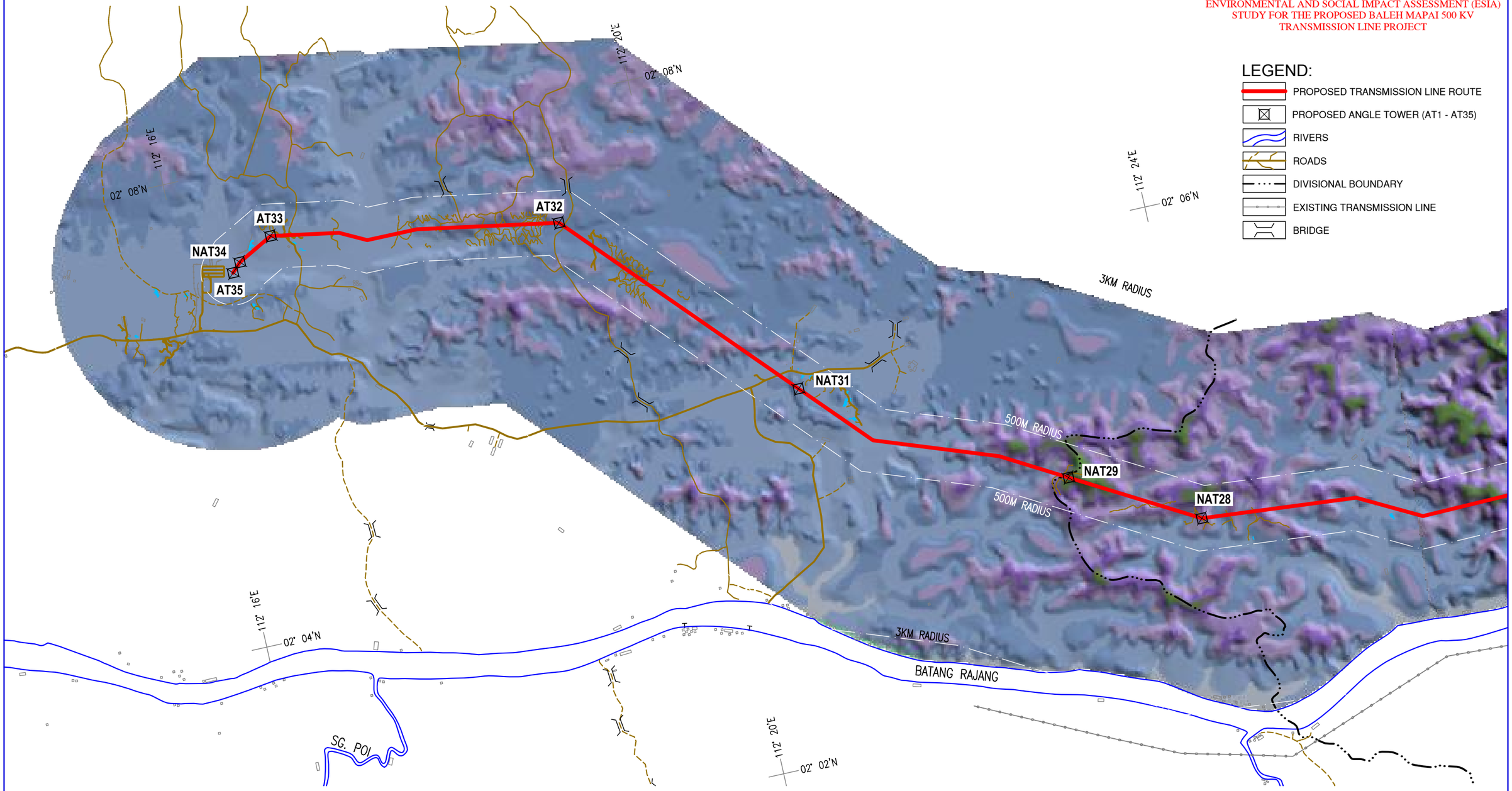

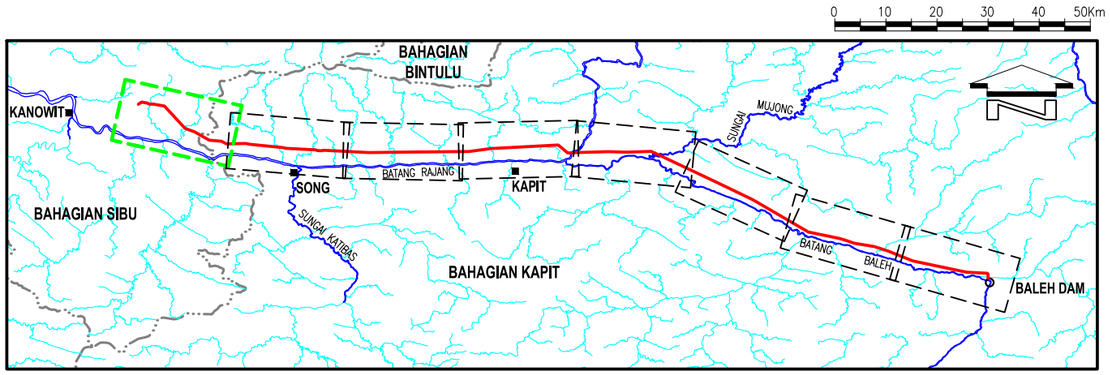

REFERENCE TO HEIGHTS IN METRES

180-200	380-400	580-600	780-800
160-180	360-380	560-580	760-780
140-160	340-360	540-560	740-760
120-140	320-340	520-540	720-740
100-120	300-320	500-520	700-720
80-100	280-300	480-500	680-700
60-80	260-280	460-480	660-680
40-60	240-260	440-460	640-660
20-40	220-240	420-440	620-640
0-20	200-220	400-420	600-620

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

TOPOGRAPHY MAP

FIGURE: 5.4.1a

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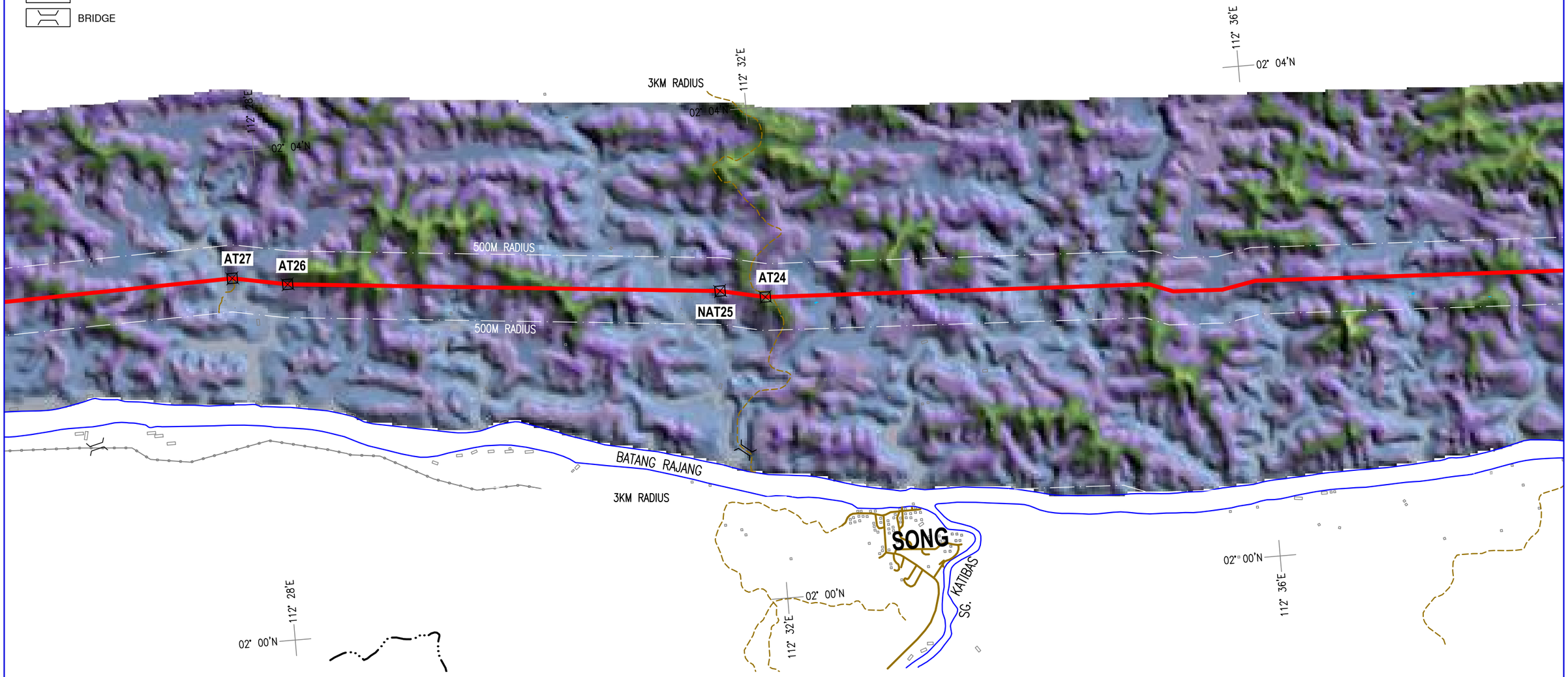
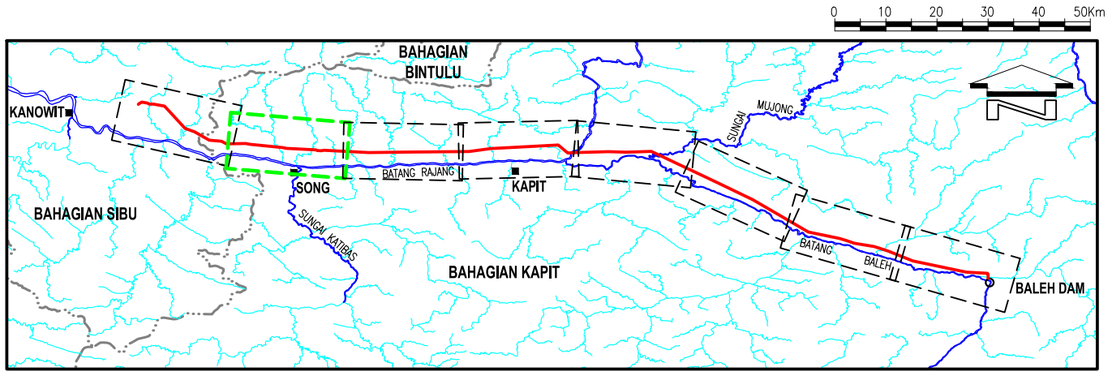
LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- DIVISIONAL BOUNDARY
- EXISTING TRANSMISSION LINE
- BRIDGE





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40-60	240-260	440-460	640-660
20-40	220-240	420-440	620-640
0-20	200-220	400-420	600-620

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

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TOPOGRAPHY MAP

FIGURE: 5.4.1b

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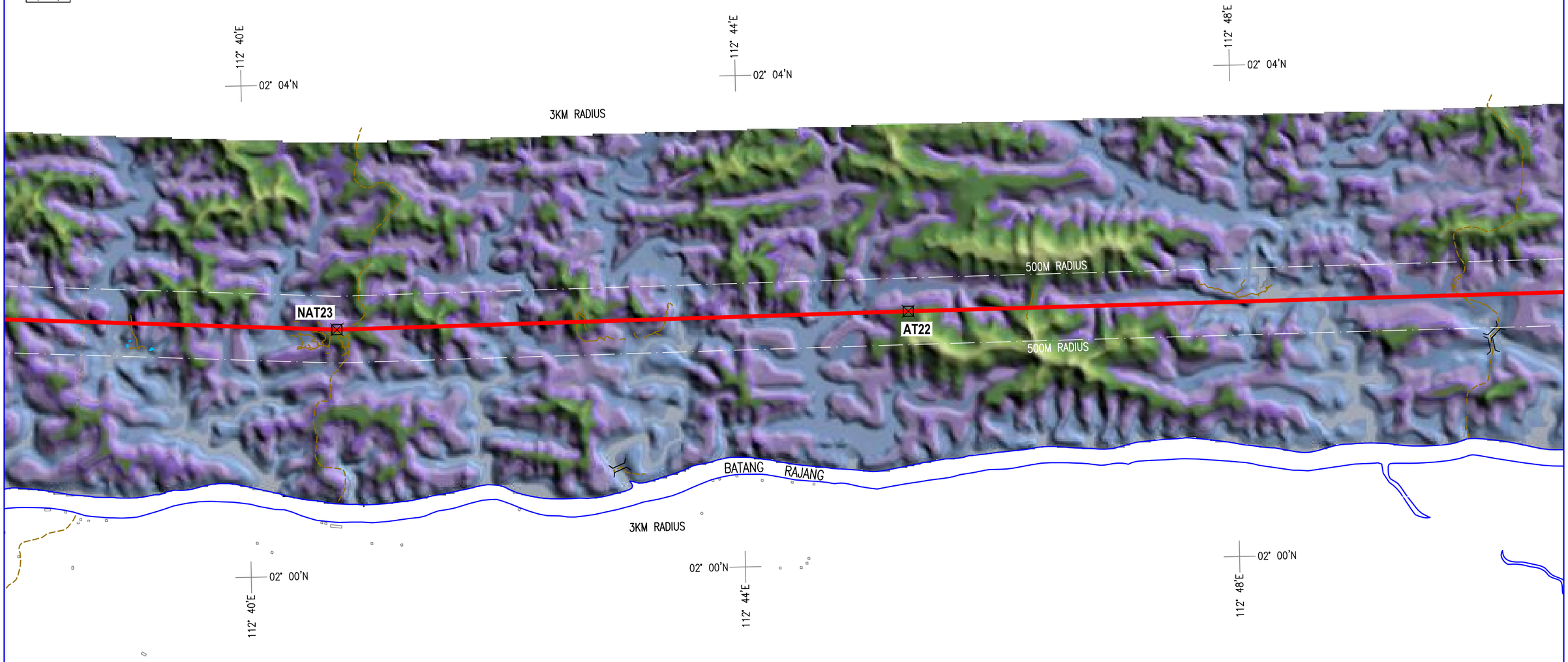
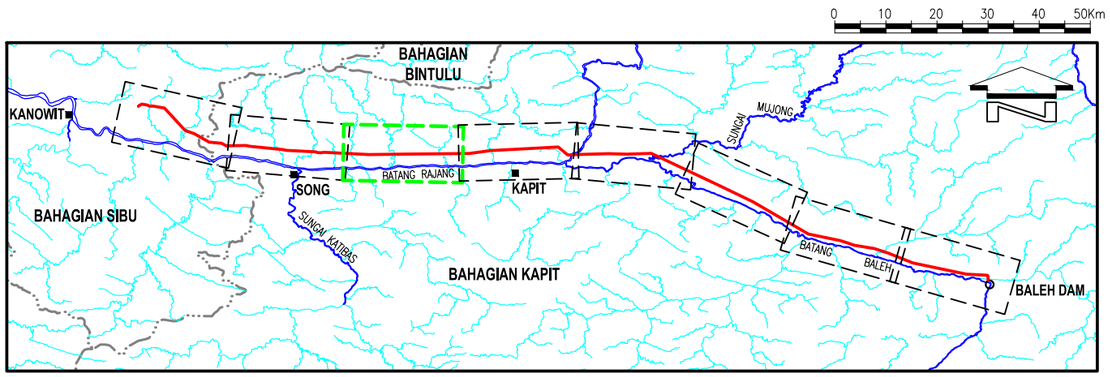
- ROADS
- BRIDGE





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SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID

–The inner crosses indicate the Latitude and Longitude

TOPOGRAPHY MAP

FIGURE: 5.4.1c

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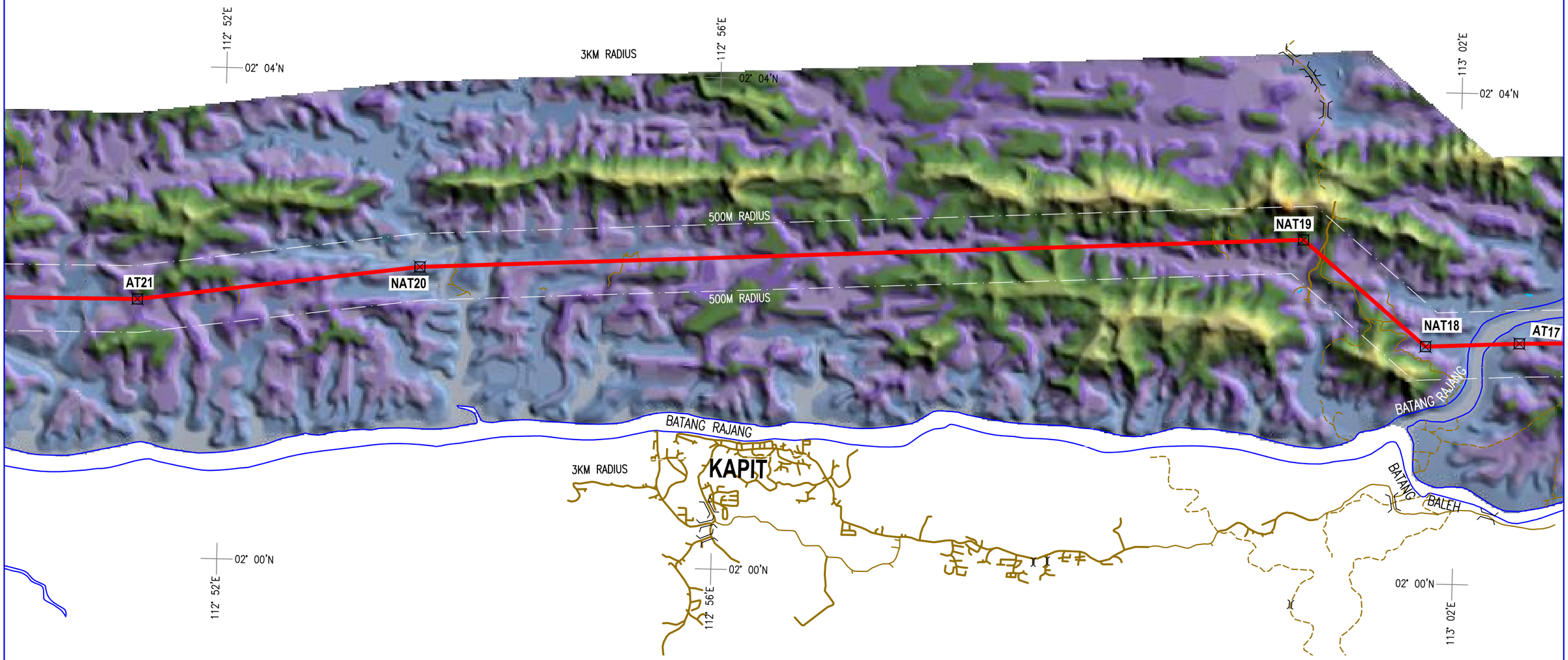

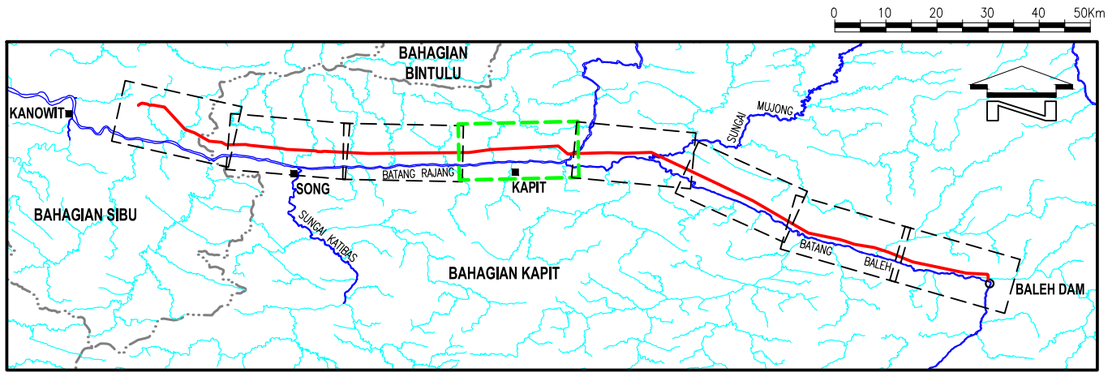

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180-200	380-400	580-600	780-800
160-180	360-380	560-580	760-780
140-160	340-360	540-560	740-760
120-140	320-340	520-540	720-740
100-120	300-320	500-520	700-720
80-100	280-300	480-500	680-700
60-80	260-280	460-480	660-680
40-60	240-260	440-460	640-660
20-40	220-240	420-440	620-640
0-20	200-220	400-420	600-620

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

TOPOGRAPHY MAP

FIGURE: 5.4.1d

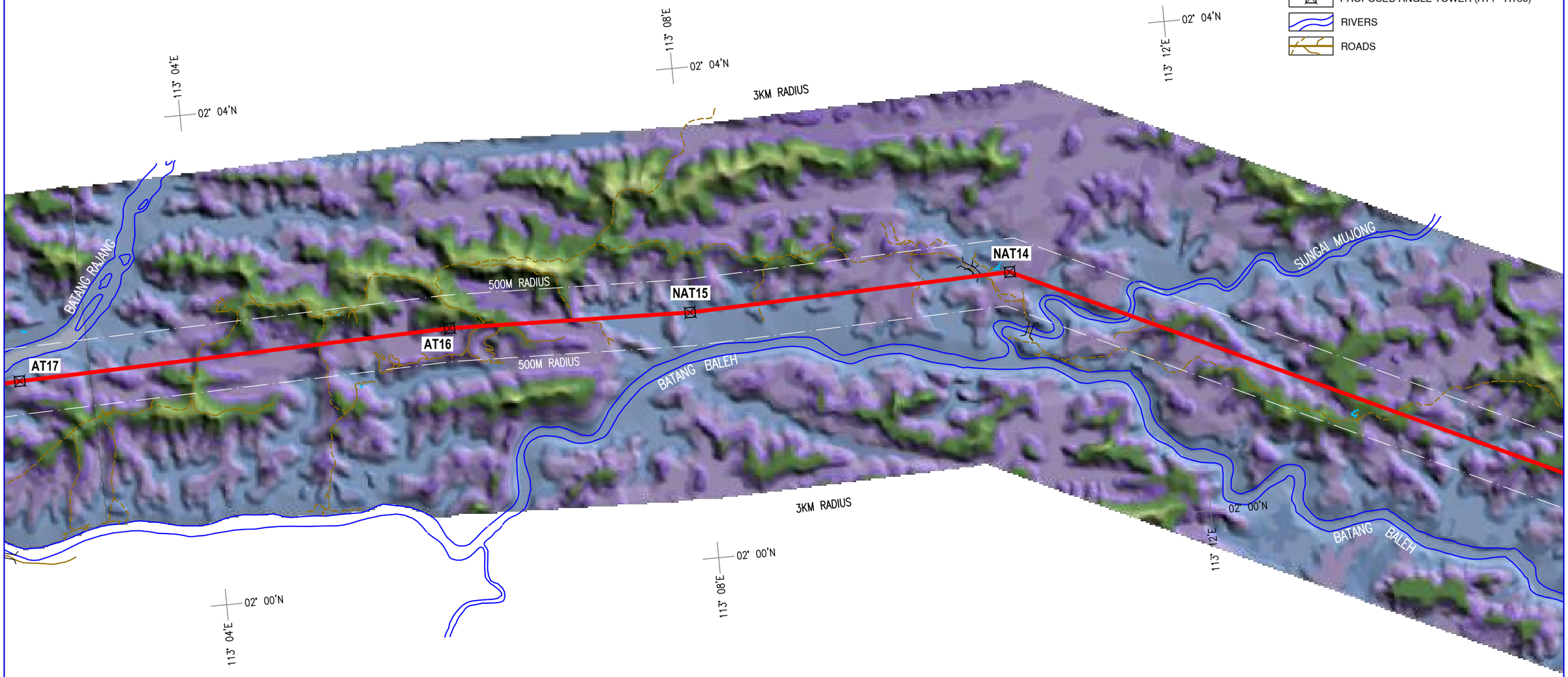
D:\ACAD\DRAWINGS\EV103\792\FIG-541a_541h.DWG

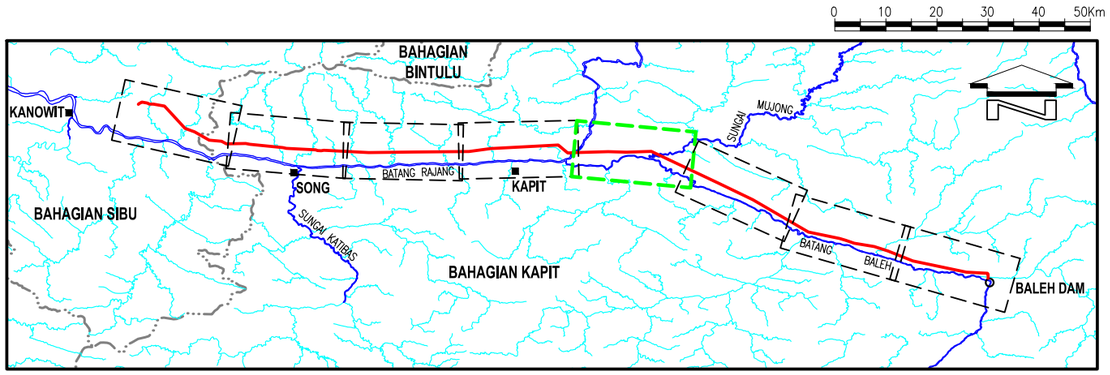
CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE PROPOSED BALEH MAPAI 500 KV TRANSMISSION LINE PROJECT

LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS





REFERENCE TO HEIGHTS IN METRES

180-200	380-400	580-600	780-800
160-180	360-380	560-580	760-780
140-160	340-360	540-560	740-760
120-140	320-340	520-540	720-740
100-120	300-320	500-520	700-720
80-100	280-300	480-500	680-700
60-80	260-280	460-480	660-680
40-60	240-260	440-460	640-660
20-40	220-240	420-440	620-640
0-20	200-220	400-420	600-620

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID

–The inner crosses indicate the Latitude and Longitude

TOPOGRAPHY MAP

FIGURE: 5.4.1e

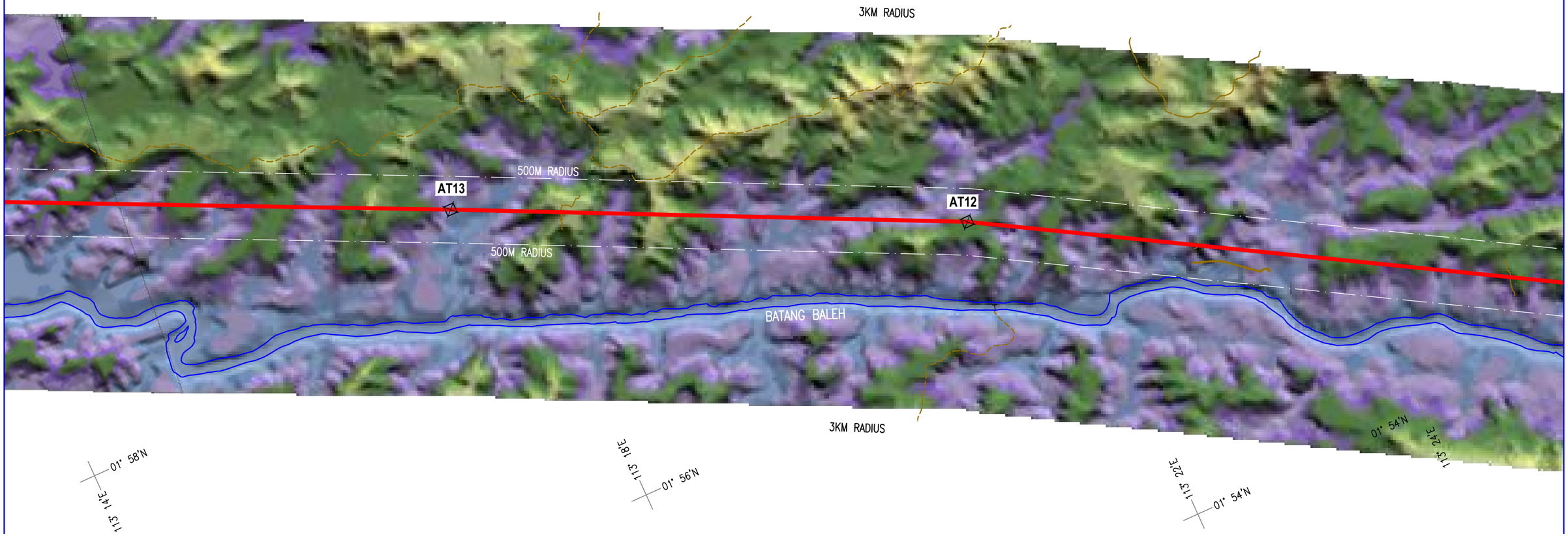
D:\ACAD\DRAWINGS\EV103\792\FIG-541a_541h.DWG

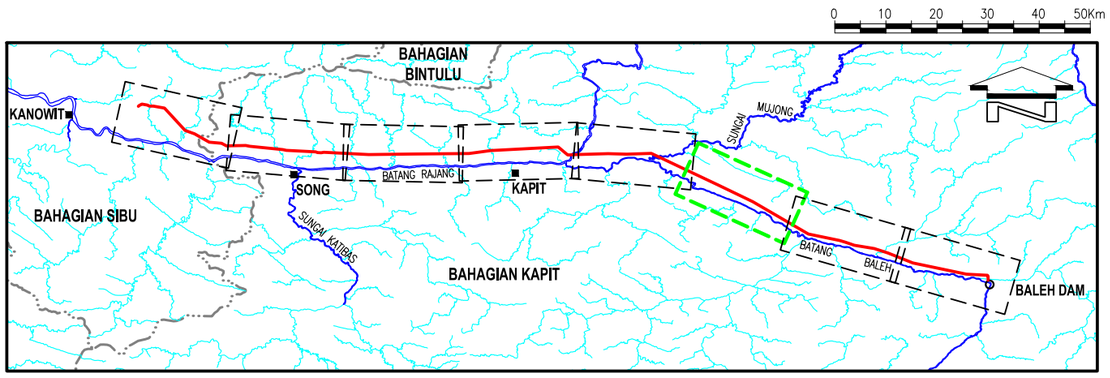
CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT

LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS





REFERENCE TO HEIGHTS IN METRES

180-200	380-400	580-600	780-800
160-180	360-380	560-580	760-780
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60-80	260-280	460-480	660-680
40-60	240-260	440-460	640-660
20-40	220-240	420-440	620-640
0-20	200-220	400-420	600-620

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

TOPOGRAPHY MAP

FIGURE: 5.4.1f

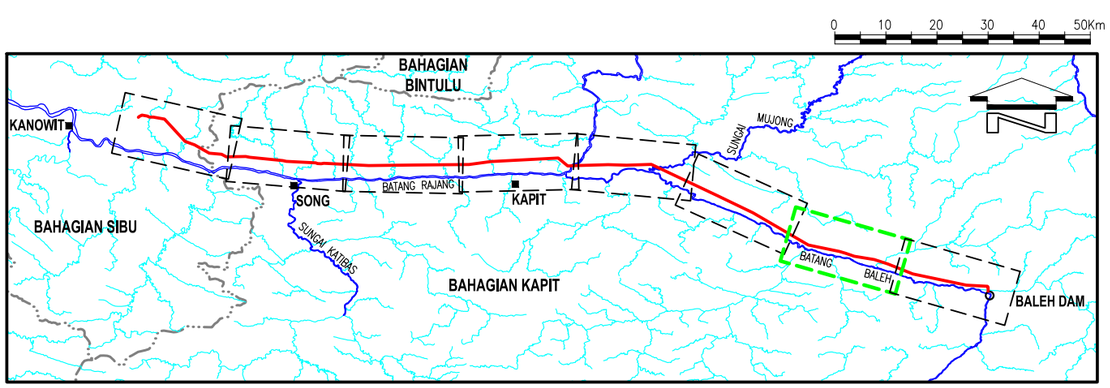
D:\ACAD\DRAWINGS\EV103\792\FIG-541a_541h.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT

LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS



REFERENCE TO HEIGHTS IN METRES

180-200	380-400	580-600	780-800
160-180	360-380	560-580	760-780
140-160	340-360	540-560	740-760
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100-120	300-320	500-520	700-720
80-100	280-300	480-500	680-700
60-80	260-280	460-480	660-680
40-60	240-260	440-460	640-660
20-40	220-240	420-440	620-640
0-20	200-220	400-420	600-620

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

TOPOGRAPHY MAP

FIGURE: 5.4.1g

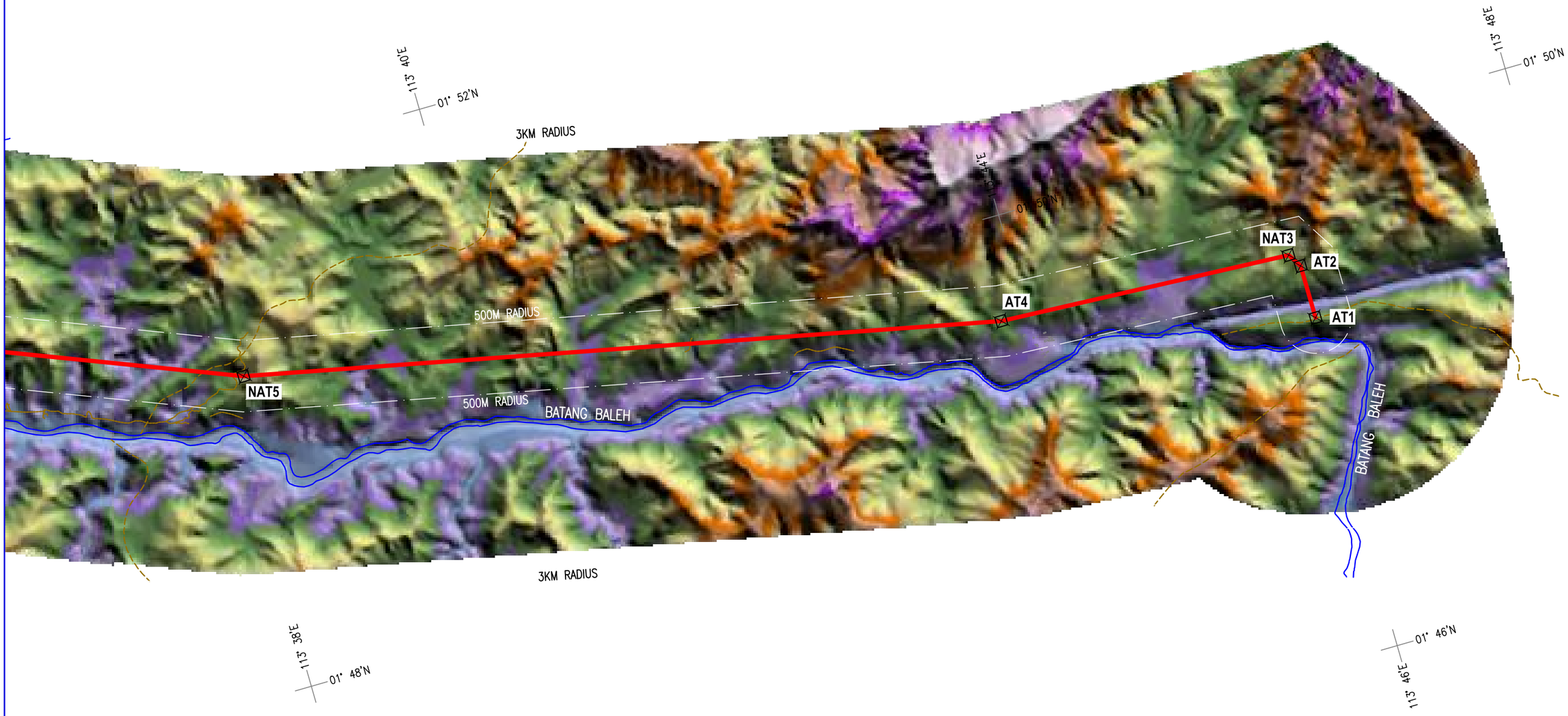
D:\ACAD\DRAWINGS\EV103\792\FIG-541a_541h.DWG

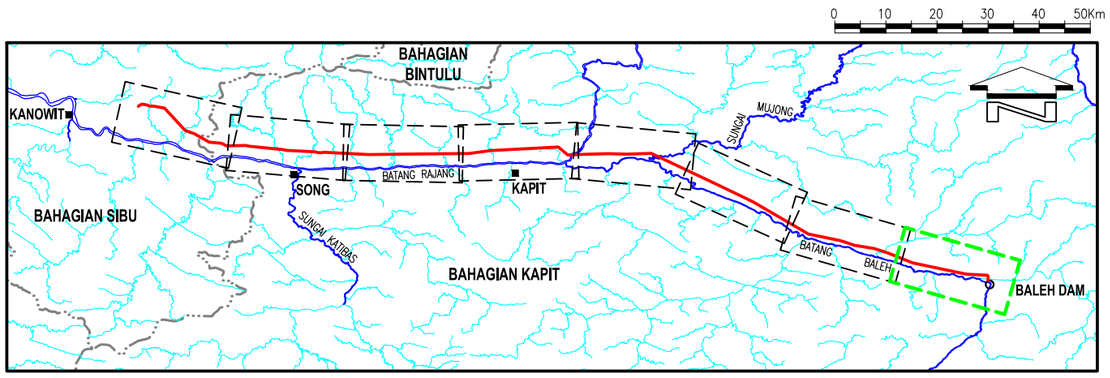
CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT

LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS





REFERENCE TO HEIGHTS IN METRES

180-200	380-400	580-600	780-800
160-180	360-380	560-580	760-780
140-160	340-360	540-560	740-760
120-140	320-340	520-540	720-740
100-120	300-320	500-520	700-720
80-100	280-300	480-500	680-700
60-80	260-280	460-480	660-680
40-60	240-260	440-460	640-660
20-40	220-240	420-440	620-640
0-20	200-220	400-420	600-620

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

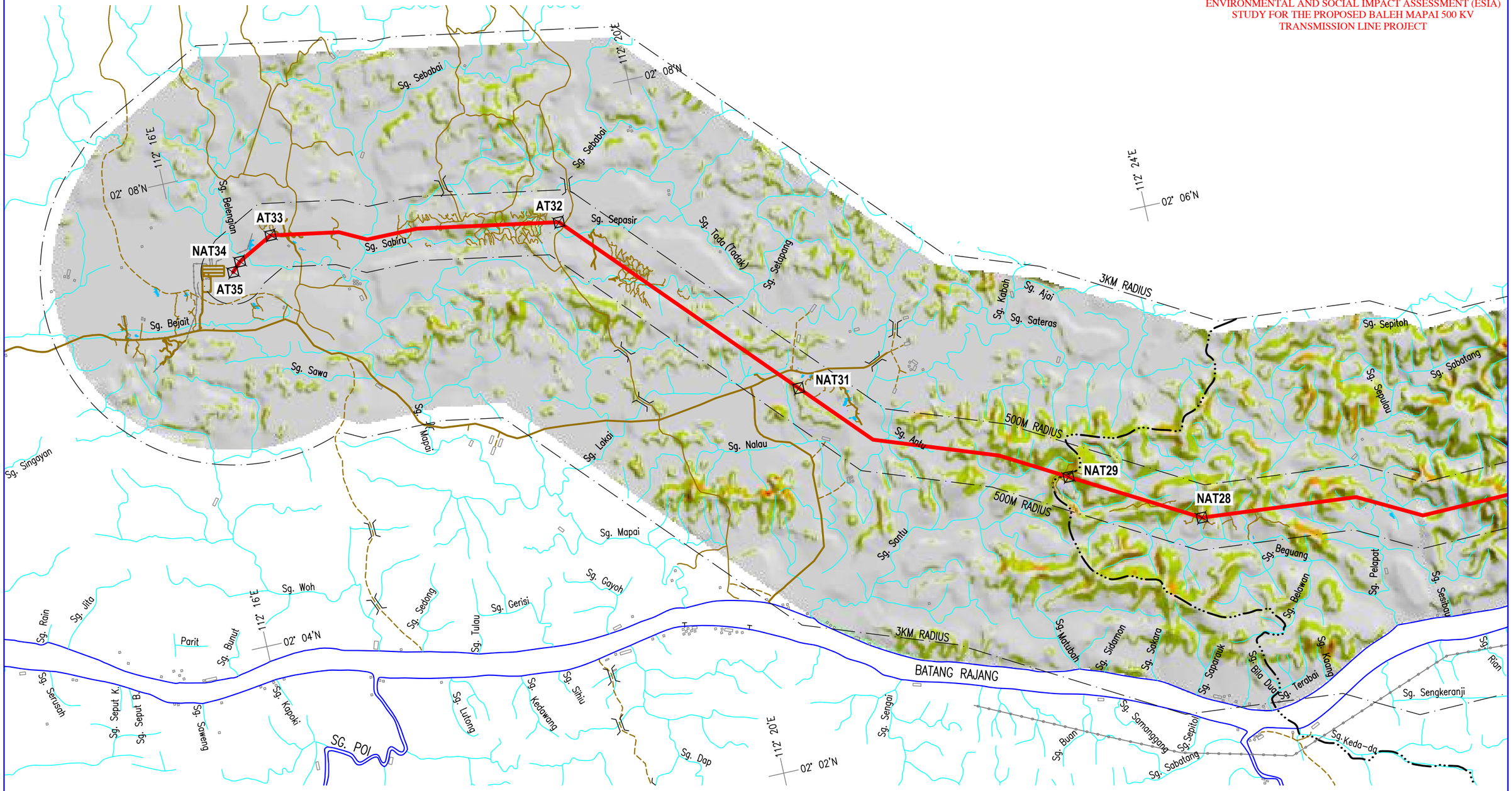
TOPOGRAPHY MAP

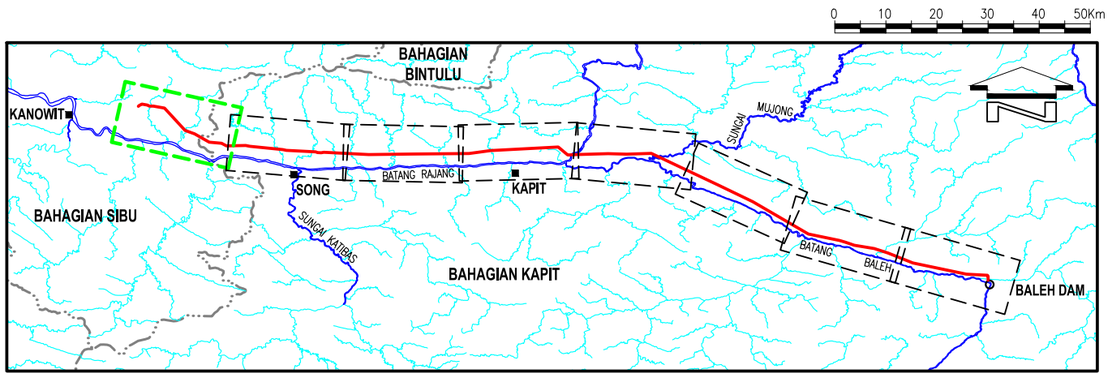
FIGURE: 5.4.1h

D:\ACAD\DRAWINGS\EV103\792\FIG-541a_541h.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- DIVISIONAL BOUNDARY
- EXISTING TRANSMISSION LINE
- BRIDGE

Slope in degrees

- 0 - 15
- 15 - 25
- 25 - 35
- >35

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

SLOPE CLASSIFICATION MAP

FIGURE: 5.4.2a

D:\ACAD\DRAWINGS\EV103\792\FIG-542a_542h.DWG

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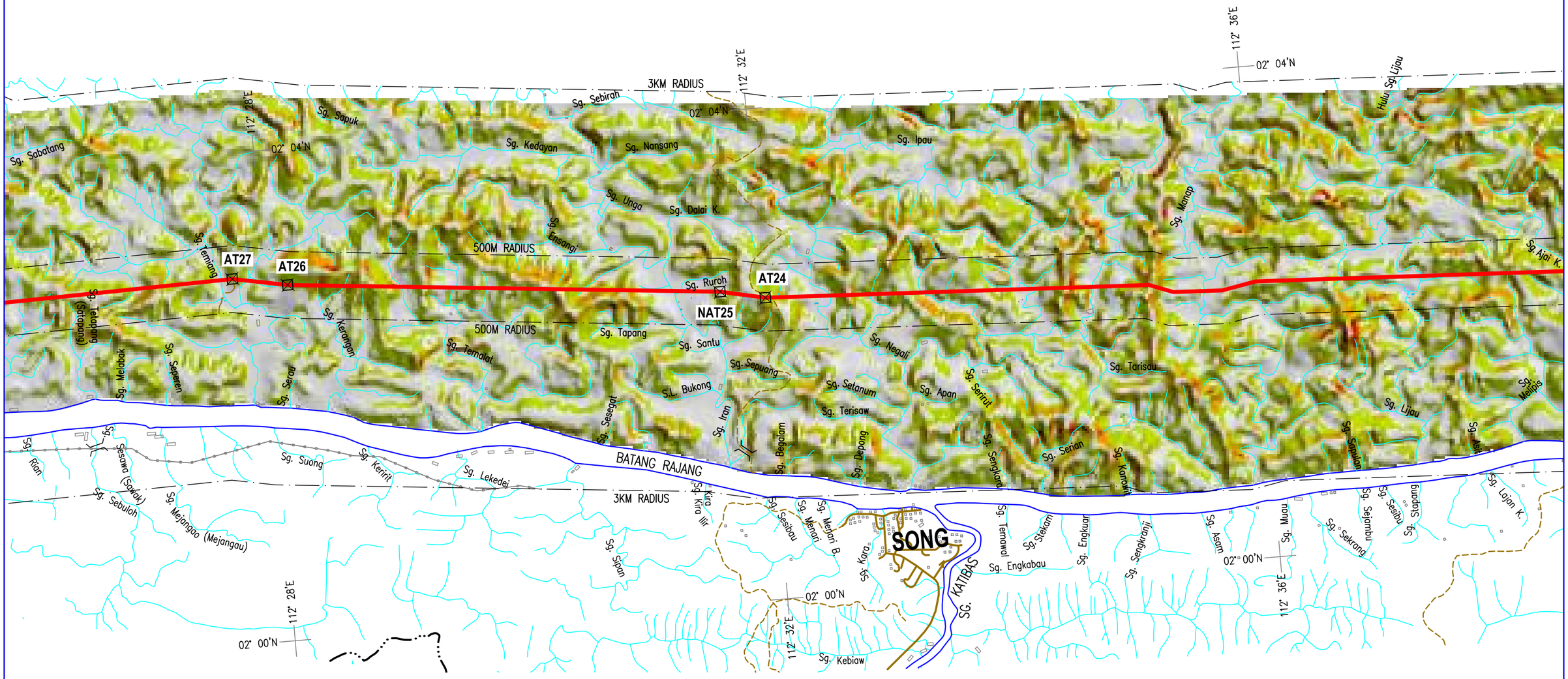
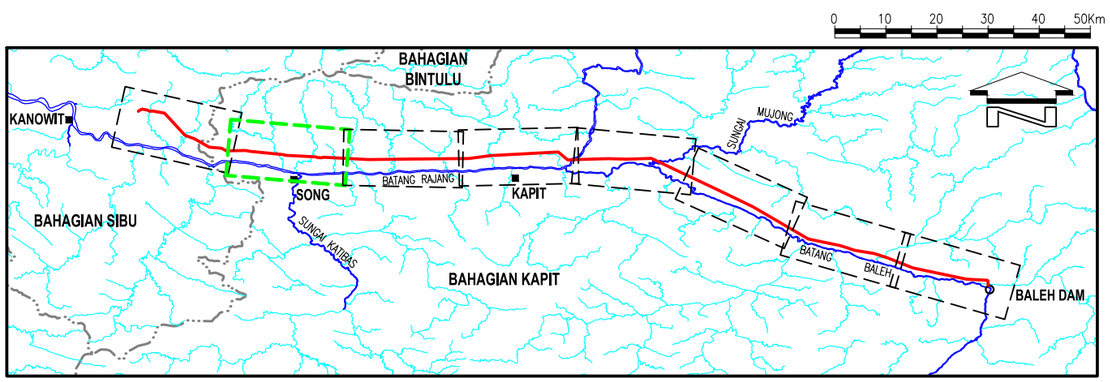
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- DIVISIONAL BOUNDARY
- EXISTING TRANSMISSION LINE
- BRIDGE

Slope in degrees

- 0 - 15
- 15 - 25
- 25 - 35
- >35

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

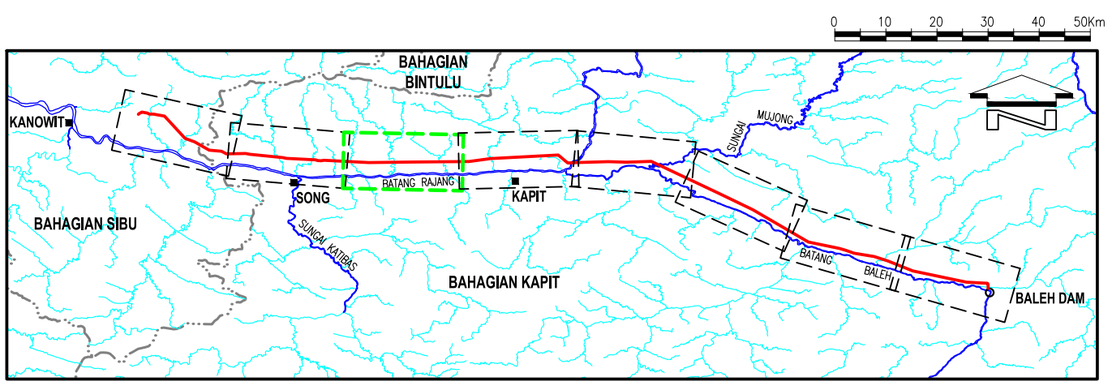
SLOPE CLASSIFICATION MAP

FIGURE: 5.4.2b

D:\ACAD\DRAWINGS\EV103\792\FIG-542a_542h.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT



LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- BRIDGE

Slope in degrees

- 0 - 15
- 15 - 25
- 25 - 35
- >35

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

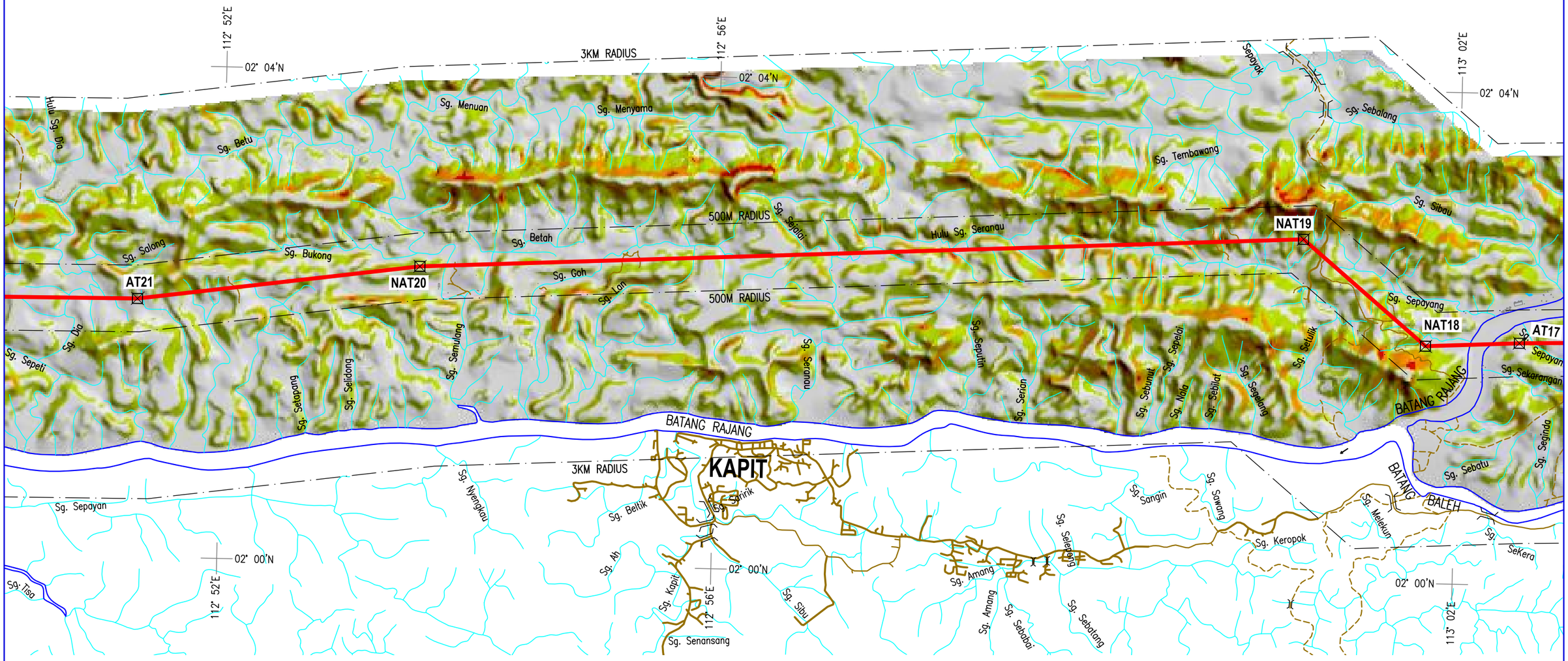
SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

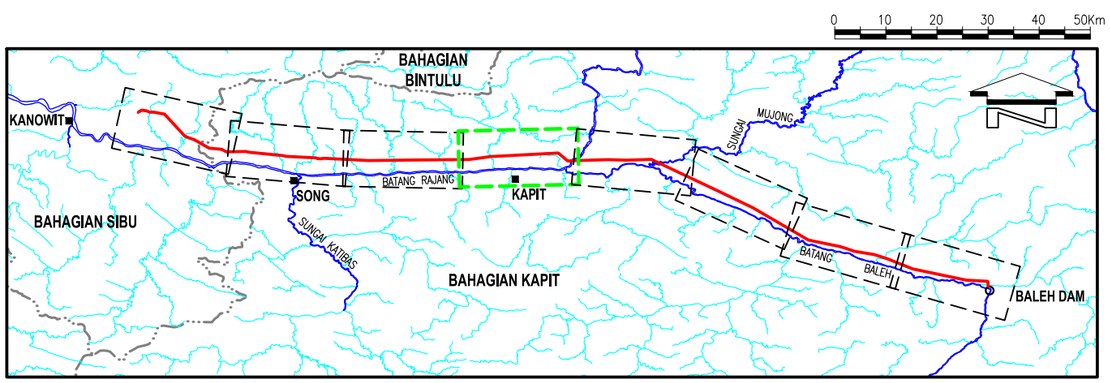
GRID
–The inner crosses indicate the Latitude and Longitude

SLOPE CLASSIFICATION MAP

FIGURE: 5.4.2c

D:\ACAD\DRAWINGS\EV103\792\FIG-542a_542h.DWG





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- BRIDGE

Slope in degrees

- 0 - 15
- 15 - 25
- 25 - 35
- >35

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

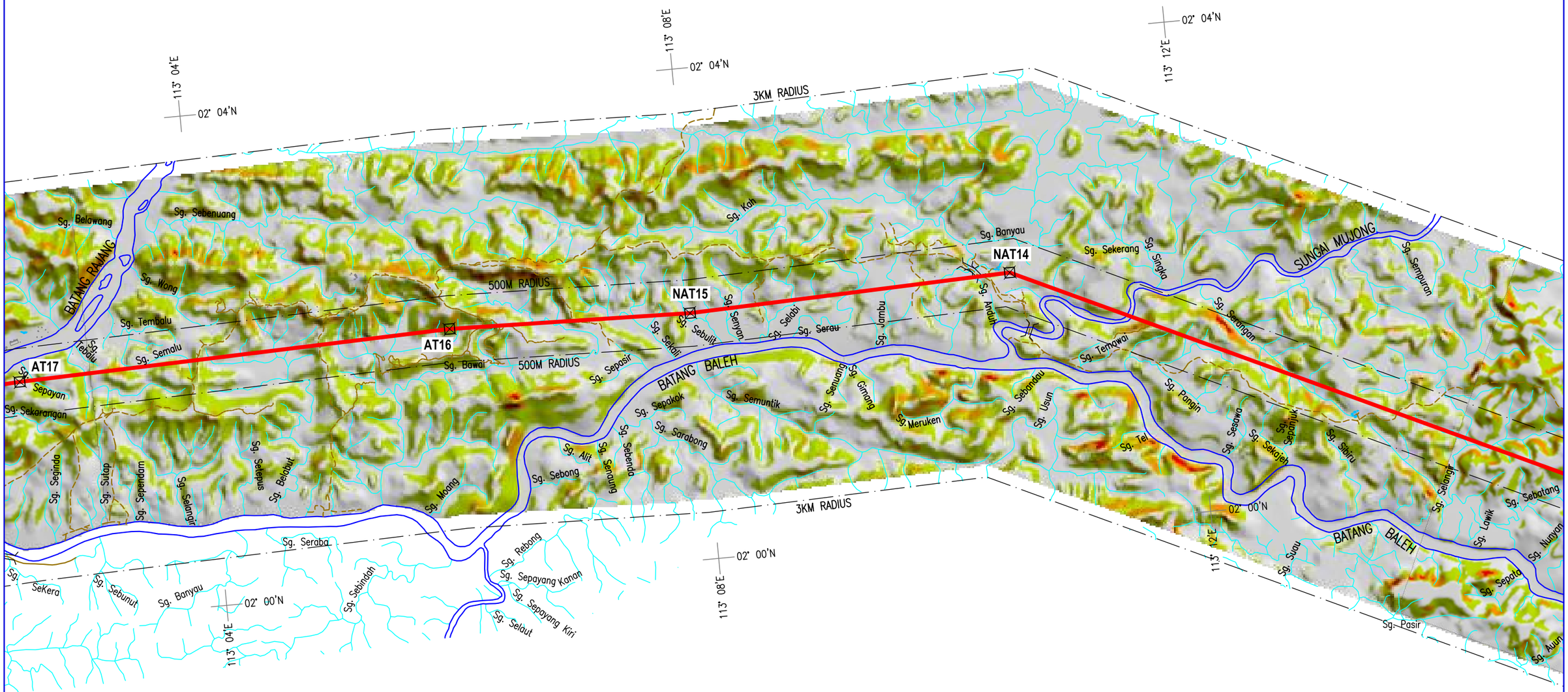
SOURCE: Adapted from

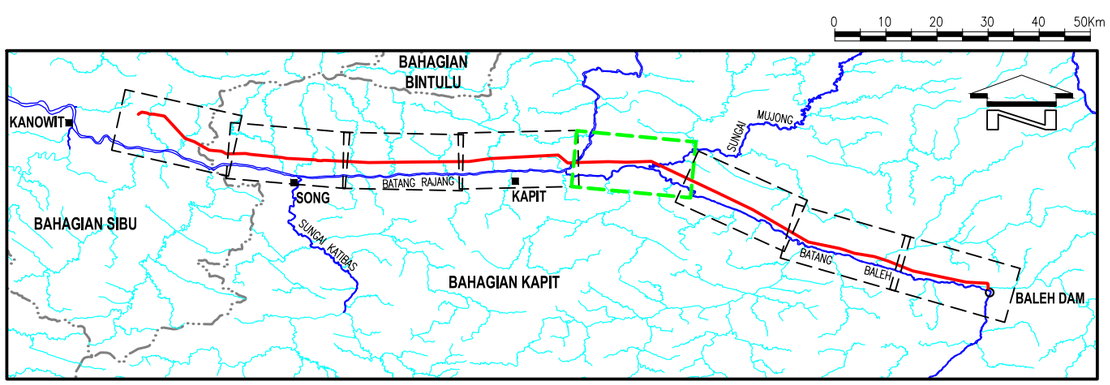
SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

SLOPE CLASSIFICATION MAP

FIGURE: 5.4.2d





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS

Slope in degrees

- 0 - 15
- 15 - 25
- 25 - 35
- >35

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

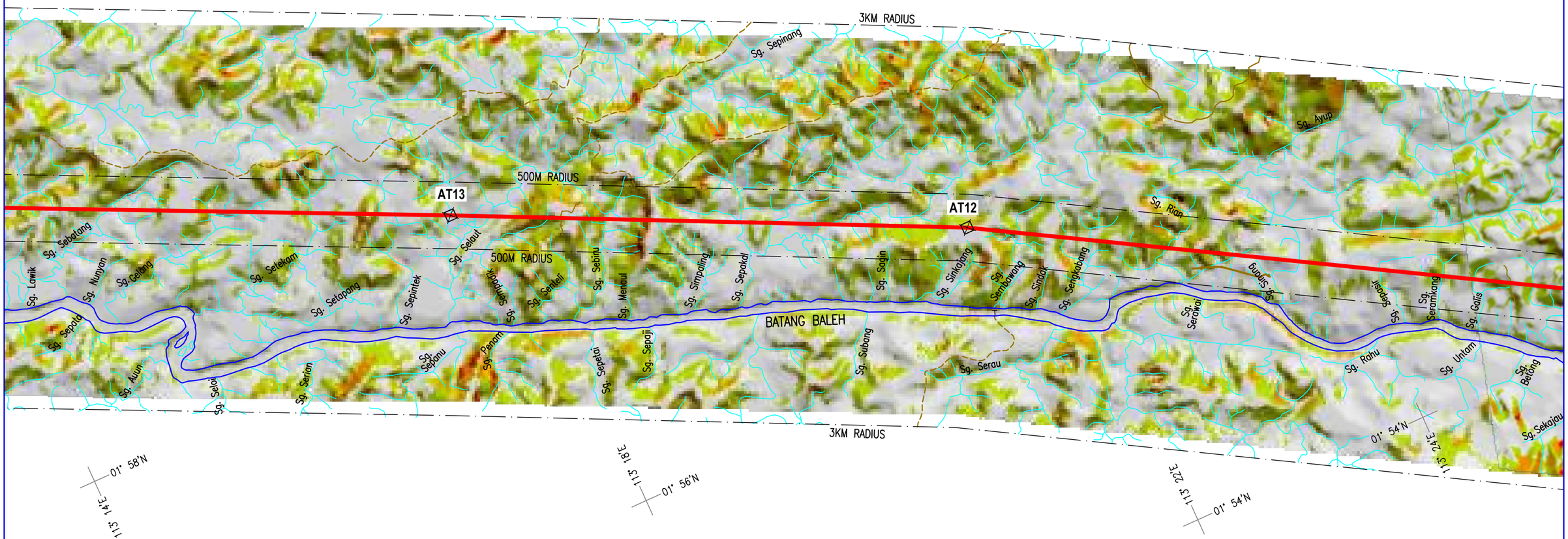
SLOPE CLASSIFICATION MAP

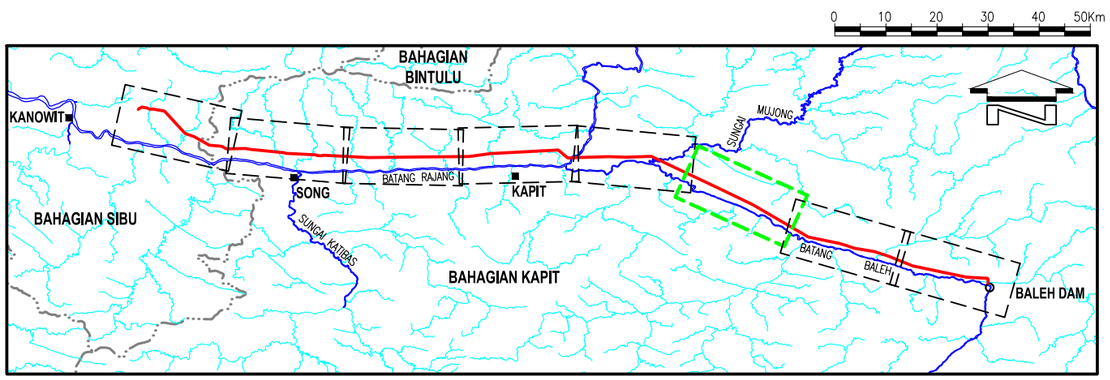
FIGURE: 5.4.2e

D:\ACAD\DRAWINGS\EV103\792\FIG-542a_542h.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS

Slope in degrees

- 0 - 15
- 15 - 25
- 25 - 35
- >35

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

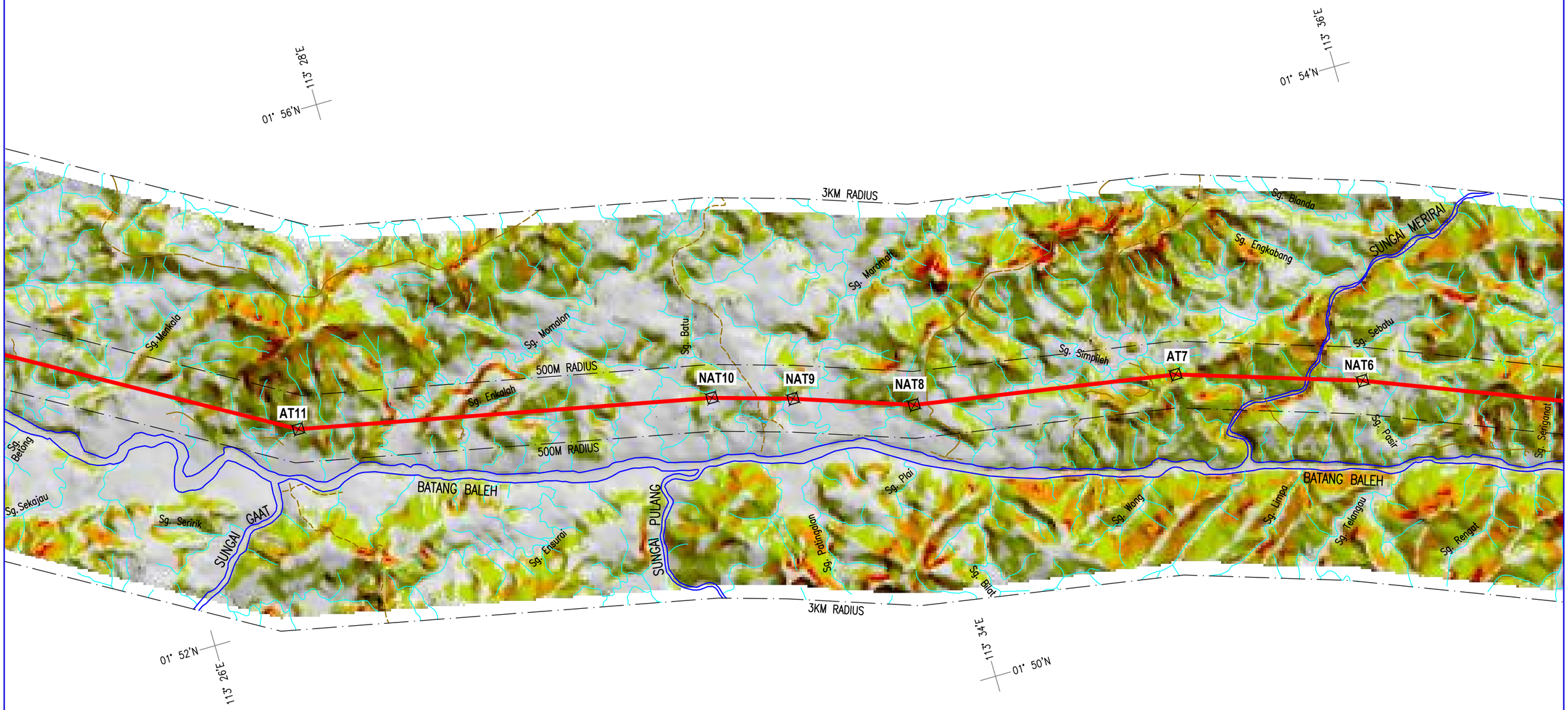
SLOPE CLASSIFICATION MAP

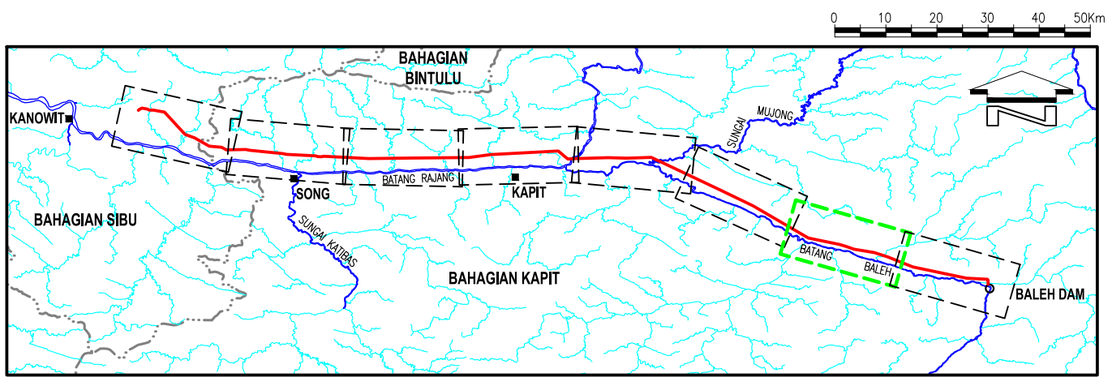
FIGURE: 5.4.2f

D:\ACAD\DRAWINGS\EV103\792\FIG-542a_542h.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS

Slope in degrees

- 0 - 15
- 15 - 25
- 25 - 35
- >35

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

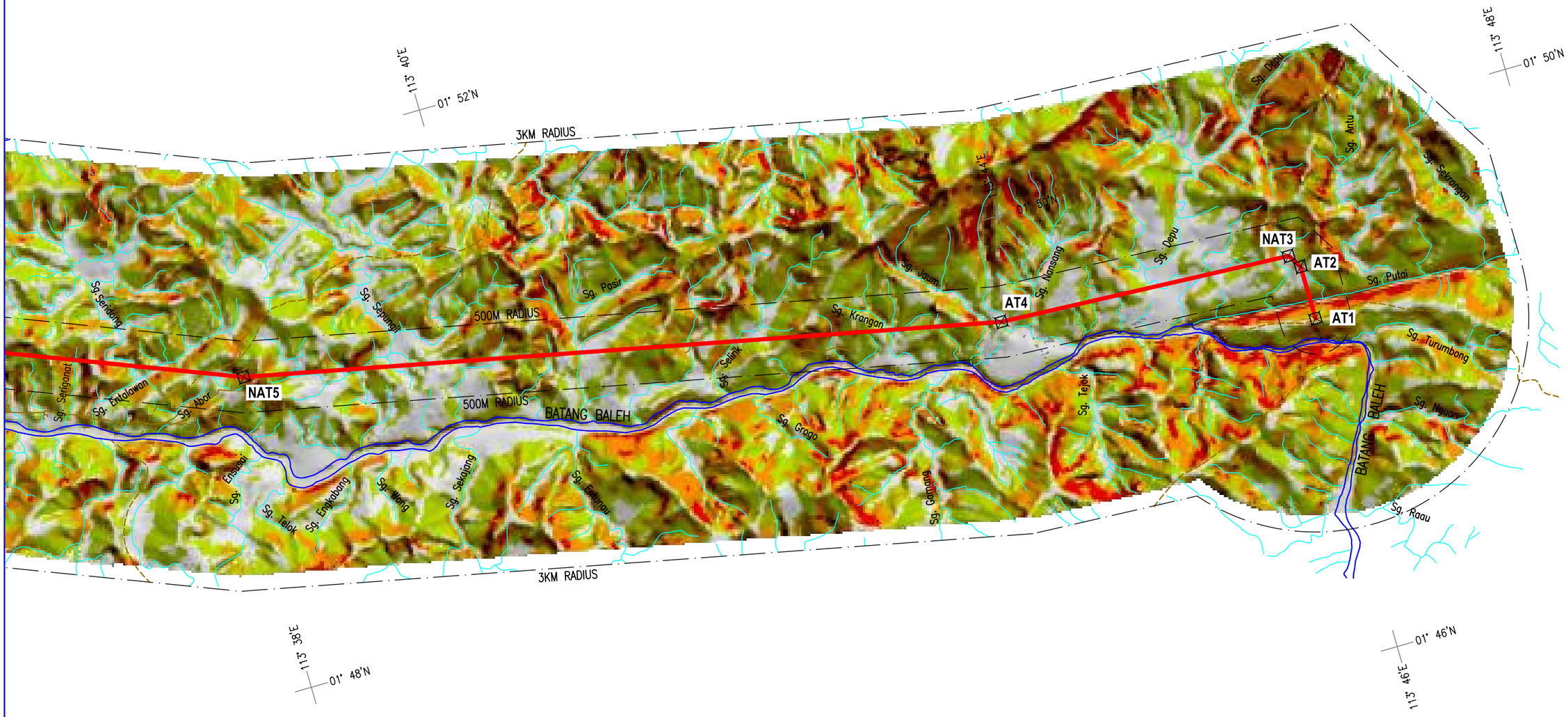
SLOPE CLASSIFICATION MAP

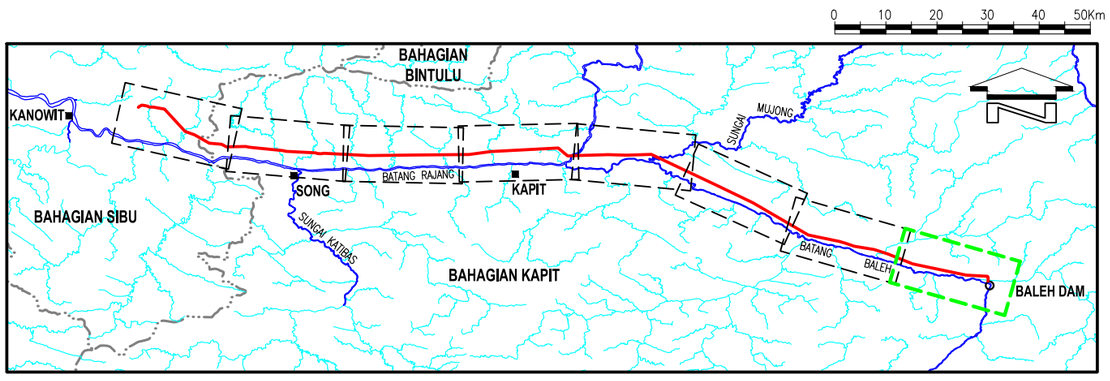
FIGURE: 5.4.2g

D:\ACAD\DRAWINGS\EV103\792\FIG-542a_542h.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS

Slope in degrees

- 0 - 15
- 15 - 25
- 25 - 35
- >35

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

SLOPE CLASSIFICATION MAP

FIGURE: 5.4.2h

D:\ACAD\DRAWINGS\EV103\792\FIG-542a_542h.DWG

5.5 GEOLOGY

As shown in **Figure 5.5.1**, Btg. Rajang and Btg. Baleh flow through Belaga Formation, a very thick sedimentary rock sequence formed from the late Cretaceous to late Eocene (60 to 30 million years ago). Kapit Member and Layar Member are two prominent members of Belaga Formation. The proposed transmission line alignment will be located above areas underlain by both geological formations.

The Kapit Member, formed during the Paleocene-Eocene era (60 to 55 million years ago) overlies conformably on the Layar Member. The lithology is similar to the Layar Member but contains a greater proportion of phyllites weathered to purplish and red colour, which is the characteristic of the Member. The Formation is similarly strongly folded and faulted.

The oldest member, the Layar Member (late Cretaceous) forms a thick belt (40 km wide) north of the Lupar Line extending up to the border with Kalimantan Indonesia and beyond. The Layar Member Stage I rocks (the oldest) of the Belaga Formation consists mainly of argillite, slate, phyllite and infrequent thin beds of greywacke sandstone (Wolfenden, 1960). The argillites are indurated, dark grey to black siltstone or claystone, often slightly metamorphosed, and show faulting and brecciation. The greywacke sandstone is subordinate and occurs as thin beds, sometimes up to 3 or 4 m thick, within the very thick sequence of argillite. Thin quartz veins are sometimes present in areas of faulting. The moderately weathered rock mass is generally massive and strong if sandstone is encountered, and flaky (but moderately strong) if shale is encountered. The shale is often slightly metamorphosed and is slaty in places.

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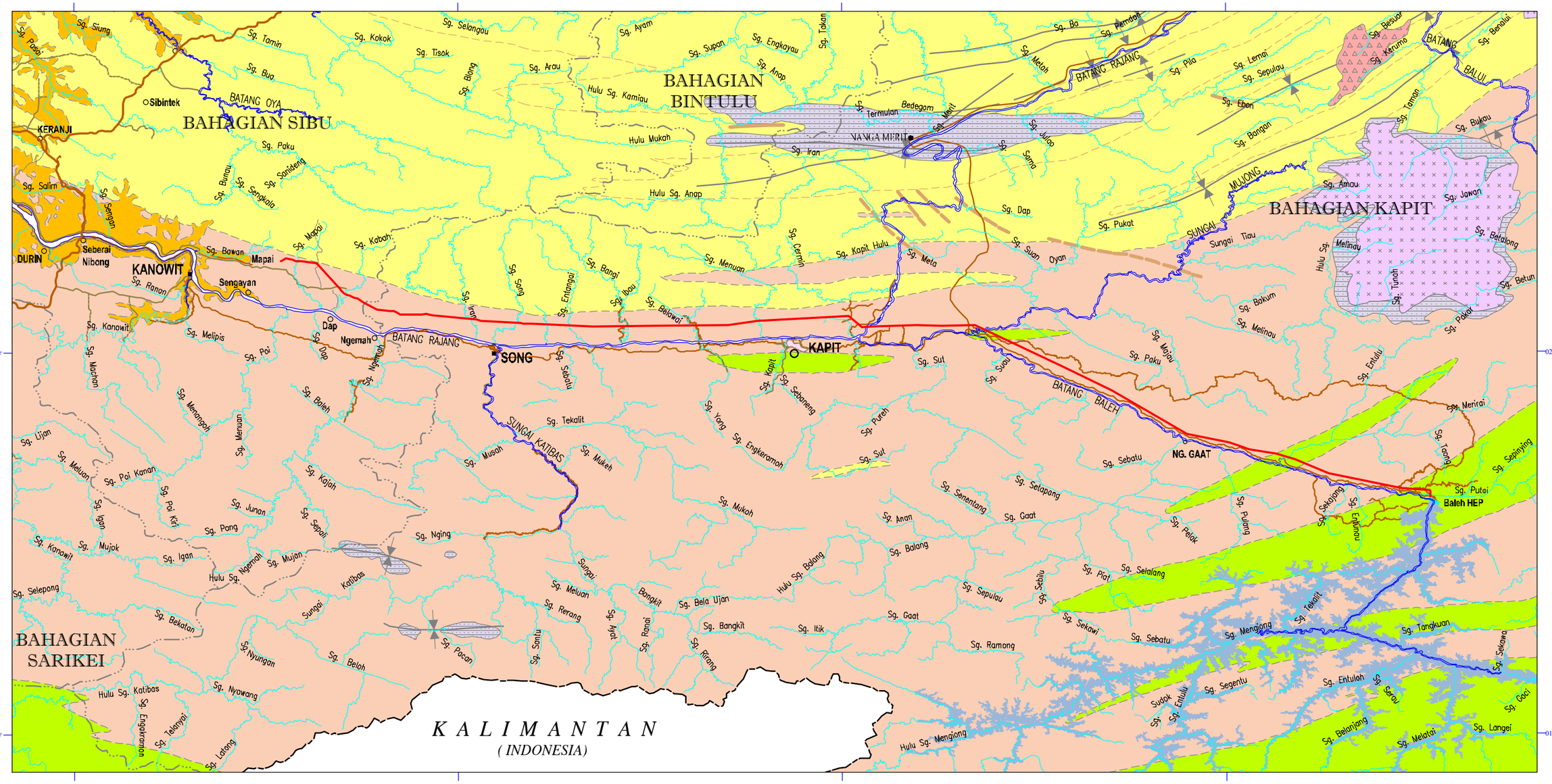


LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- INTERNATIONAL BOUNDARY
- DIVISIONAL BOUNDARY
- BALEH DAM
- BALEH DAM RESERVOIR
- RIVERS / STREAMS
- ROADS / MOTORABLE TRACK

IGNEOUS PLEISTOCENE–HOLOCENE
Dacite and basalt lavas in Upper Rajang at Linau–Balui Plateau, Pila and Plieran; andesite at Sematan

IGNEOUS PLIOCENE–PLEISTOCENE
Upper Rajang andesite and basalt lavas at Hose Mountains, Usun Apau Plateau, Nieuwenhuis Mountain; microtonalite at Bt. Kalulong, Tinjar Valley; micragranodiorite, microtonalite, andesite and basalt dikes at Linau–Balui and Nieuwenhuis Mountain.

SEDIMENTARY PLEISTOCENE–HOLOCENE
Coastal and riverine alluvium, and terraces of clay, silt, sand, and gravel with layers of peat.

SEDIMENTARY LATE CRETACEOUS
Rhythmically–interbedded shale, mudstone, slate, phyllite, metagraywacke with some conglomerate lenses. Strong regional metamorphism.

SEDIMENTARY PALAEOCENE–EOCENE
Shale, slate, phyllite, sandstone with marlstone, calcareous sandstone, conglomerate and limestone lenses. Weak regional metamorphism. Chaotic assemblage of sandstone, mudstone, siltstone, chert, gabbro, basalt, spilite, limestone blocks in pervasively sheared pelitic matrix.

SEDIMENTARY EOCENE
Hard massive sandstone interbedded with sandstone, shale, and siltstone. Weak regional metamorphism.

SEDIMENTARY OLIGOCENE–MIOCENE
Sandstone, shale, mudstone, limestone, lignite with some marlstone, siltstone and calcareous sandstone.

SYMBOLS IGNEOUS ROCKS–INTRUSIVES
Intermediate to basic intrusives, mainly gabbro, diorite and their fine–grained equivalents.

SYMBOLS SEDIMENTARY ROCKS
Mixed facies; marine and continental

GEOLOGIC SYMBOLS

- Chronologic
- Formational
- Intrusive and extrusive
- Fault
- Synclinal axis with plunge
- Anticlinal axis with plunge
- Overturned anticline

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE PROPOSED BALEH-MAPAI 500 KV TRANSMISSION LINE PROJECT

N

0 10 20 30 40Km

SCALE IN KILOMETRES (1:600,000) – A3 MEDIUM

NOTE
–The outer ticks indicate the Latitude and Longitude

SOURCE: Adapted from

SERIES 8 EDITION 8 SCALE 1:500,000	GEOLOGICAL MAP OF SARAWAK SECOND EDITION, 1992 SCALE 1:500,000

GEOLOGY ALONG THE TRANSMISSION LINE ALIGNMENT

FIGURE: 5.5.1

D:\ACAD\DRAWINGS\EV103\792\FIG-551.DWG

5.6 SEISMOLOGY

Description of this section is based on data from the Detailed Design – Probabilistic Seismic Hazard Assessment for Baleh Hydro-Electric Power Plant Baleh Hydroelectric Project that was undertaken by the EPC Contractor last 2020 (China Gezhouba Group of Co.,Ltd & Gezhouba Engineering(Malaysia) Sdn Bhd & Untang Jaya Sdn Bhd, 2020). The study investigates earthquake hazard at the Baleh HEP power station and surrounding areas.

5.6.1 Tectonic Features in the Region

Practically, 99% of all earthquakes occur along the tectonic plate boundaries. The southern and eastern boundaries of the Sunda Shelf Plate lie closest to the Project site and are marked by the Indonesian Arc and the Philippine Arc, respectively. Seismic activities from the Indonesian Arc are generally confined to the area where the northward thrusting Australian Plate impacts on the region of the Asian Plate contained by the Sunda Shelf Plate. There is seismicity along the Philippine Plate located east of Sabah that also contributes to the earthquakes felt in the eastern parts of Sarawak. Significant seismic activities are generally confined to east and south of this Benioff[1] Zone.

As the majority of the seismic activity is on the edge of the Sunda Shelf plate, there are few recorded earthquakes inland and offshore Sarawak.

5.6.2 Seismicity of Sarawak and Surrounding Region

Since damaging earthquakes are fortunately rare in Sarawak, the region is characterized by relatively low to-moderate earthquakes. From historical records ranging between 1900 and 2020, a total of 30 earthquakes with magnitudes ranging from 3.5 to 5.4 moment magnitude (*Mw*) were recorded. The earthquake records within a 1000 km radius of the Baleh HEP is plotted and shown in **Figure 5.6.1**.

[1] Benioff zone is a long narrow region, usually adjacent to a continent, along which earthquake foci lie on a plane which dips downwards at about 45° and along which the oceanic lithosphere is thought to be descending into the earth's interior.

The earthquake records show local seismicity in the Sarawak area to be about average by normal stable continental levels, with very active plate boundaries to the south near the Sunda Trench region, and to the east in the Sulawesi region. The distant earthquakes are far enough away to produce very low hazard in Sarawak.

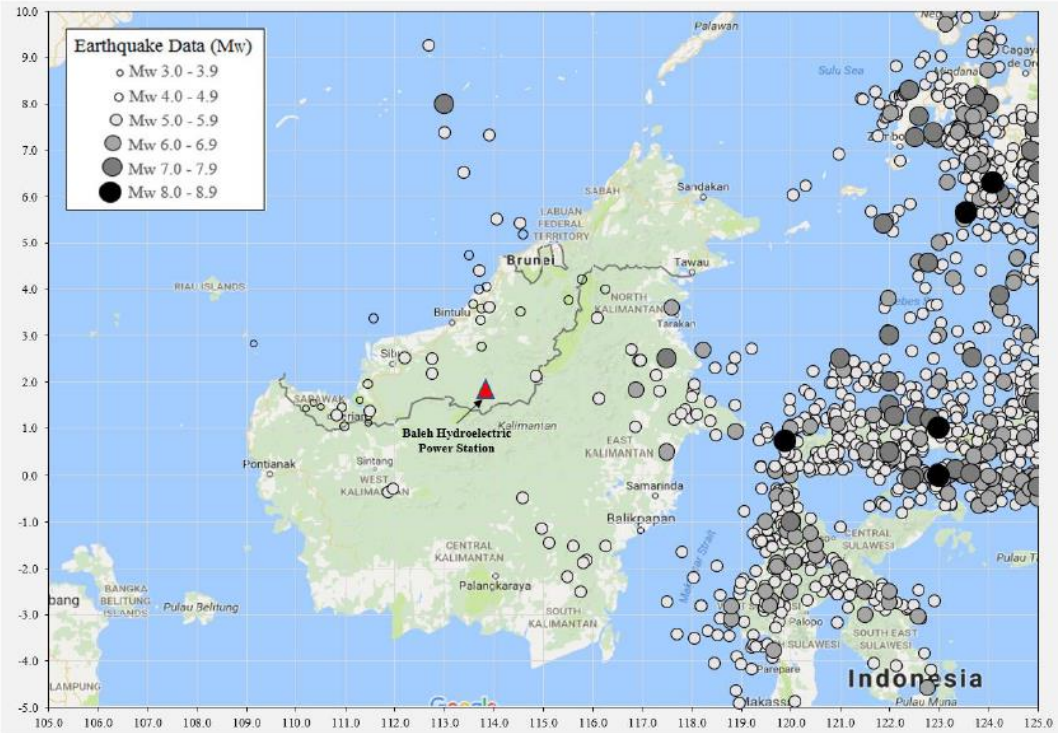
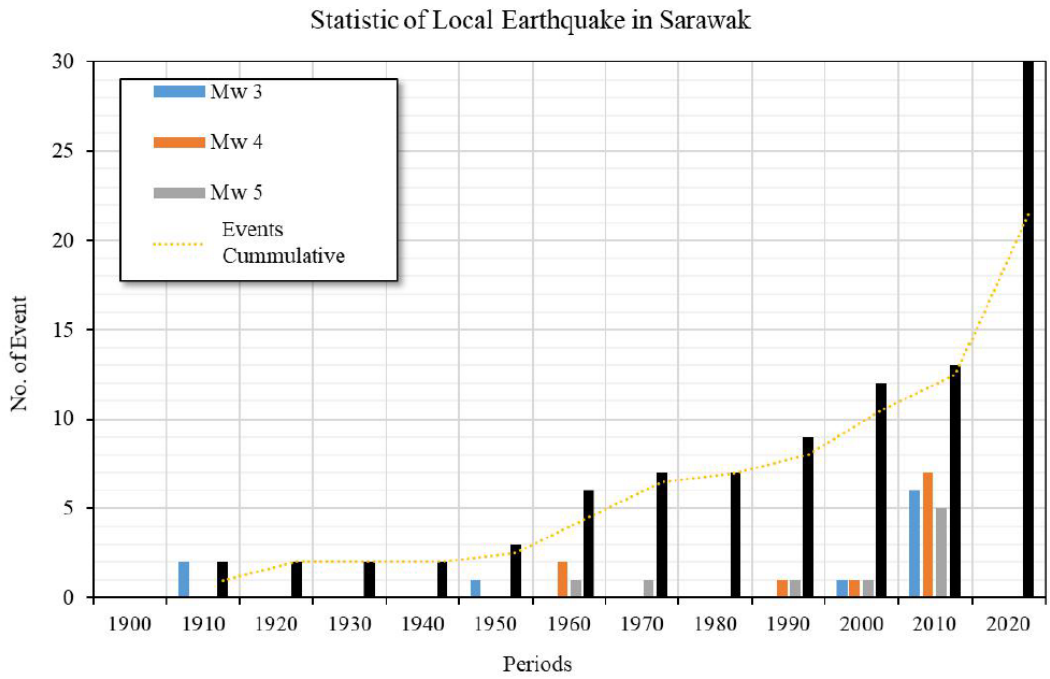


Figure 5.6.1: Completed Catalogue Analysis Plotted in the Map (Baleh HEP Power Station in Red Triangle)

The statistics for an updated earthquake recorded for 120 years observation indicates an increment of earthquake events (**Figure 5.6.2**). The rate of accumulation of this stress release by the faults is low and, consequently, earthquakes allowing the release of these stresses are infrequent.



Source: China Gezhouba Group of Co.,Ltd & Gezhouba Engineering(Malaysia) Sdn Bhd & Untang Jaya Sdn Bhd, 2020

Figure 5.6.2: Cumulative of Events in Sarawak Region Between Years 1900 Until 2020

5.7 SOILS

5.7.1 Soil Types

The proposed transmission line traverses an area which is characterised by two (2) main soil types/groups: Skeletal Soils and Red-Yellow Podzolic Soils. A map of the soil types in the region is presented in **Figure 5.7.1**. Almost the entire length of the transmission line is located above areas underlain by the mixture of Skeletal Soils and Red-yellow Podzolic Soils (99.72%) except for a small portion of gley soils at the western end, near Mapai. The percentage of soil types along the ROW is given in the table below:

Table 5.7.1: Soil Type Within 50m ROW Excluding Main Rivers

Soil Types	Area (Ha.)	Area (%)
Mainly Skeletal Soils and Red-Yellow Podzolic Soils	862.49	98.49
Mainly Red-Yellow Podzolic Soils	10.74	1.23
Gley Soils	2.46	0.28

Skeletal and red-yellow podzolic soils comprised of very shallow to moderately deep loamy sands to clays on sedimentary, acid igneous and metamorphic rocks. The terrain is generally steep and mountainous.

On the slopes, these residual soils overlying the rocks are generally thin at about 3 m depth and highly weathered rock (hard soil) at about 5 m to 10 m on hilltops becoming thinner down the slope.

Kapit and Merit series which represent the skeletal and red-yellow podzolic soils respectively, are the predominant soil series noted. Merit soils are associated with moderately to very steeply dissected hills while Kapit soils and Merit/Kapit soil associations can be found on very steep hills and mountain (with slopes more than 33 degree). These soils are highly erodible if disturbed, and left bared. The predicted soil loss using the Universal Soil Loss Equation (USLE) from bared Merit topsoil and subsoil on different slopes ranges from 1,340 to 6,861 mt/ha/yr. and 3,305 to 16,925 mt/ha/yr, respectively (see **Table 5.7.2** below). Kapit soils and Kapit/Merit soil associations with similar chemical and physical properties to Merit series, are expected to incur higher soil losses in the same circumstance due to their natural occurrences on steeper terrains.

Table 5.7.2: Potential Soil Erosion of Merit Soil Series (mt/ha/yr)

Merit - Topsoil		
Slope	Undisturbed	Bare Soil
15 deg. slope	1.3	1,340
20 deg. slope	2.3	2,328
25 deg. slope	3.7	3,678
33 deg. slope	6.9	6,861
Merit - Subsoil		
15 deg. slope	3.3	3,305
20 deg. slope	5.7	5,743
25 deg. slope	9.1	9,073
33 deg. slope	16.9	16,925

Source: CTTC/UNIMAS & Indutek Konsultant, 2009.

5.7.2 Agricultural Potential

Agricultural potential of lands is determined by the natural soil agricultural capability which is evaluated based on the number and degree of limitations to crop production of the soil. The Project area is dominated by very shallow skeletal

soils (mostly Kapit series) and red-yellow podzolic soils (mostly Merit series), and their associations. These soils generally fall under Classes 4te, 5te and 5td of soil agricultural capability. For Class 4te soils, terrain/ topography (t) and erosion (e) are the two limitations for agricultural uses; however, with proper erosion control measures such as terracing and cover cropping, oil palm, cacao, pepper, rubber and fruit trees can be cultivated although soil fertility needs to be improved.

Classes 5te and 5td soils are found on the steep and high elevated terrains where the slopes are very steep, generally more than 30 degrees. Terrain (t) is a very serious limiting factor for agricultural uses, while erosion (e) hazard is very severe and the soil depth (d) is also limited; hence, these soils are very sensitive to surface disturbance and unsuitable for agricultural activities.

Some pockets of shallow to deep red-yellow podzolic soils are also noted in Kanowit (at Mapai and Kabah), mainly associated with Merit series. These soils generally fall under Class 3te which are characterized as loamy sands to clays, with soil good structure, pH 4.9 - 5.5 and moderately fertile. The terrain (t) is suitable for most tree crops; however, erosion (e) can still occur but not serious. Oil palm, cocoa, rubber, pepper, fruit trees and other commercial crops generally performed well on these soils.

Pockets of gley soils (associated with Bijat series) are noted at low-lying areas at Mapai, and the floodplains of Btg. Rajang and its major tributaries (Sg. Kanowit, Sg. Poi and Sg. Ngemah). These soils generally fall under Classes 2i and 3wi of soil agricultural capability. They are greyish or greenish grey in colour, wet, sticky, high organic content and with moderate fertility. With drainage improvement, the wetness (w) and inundation (i) problems can be controlled. Gley soils are good for wet rice cultivation, and also other short-term crops such as vegetables, melons and corns during the drier periods of the year.

Agricultural capability of soils within the 1000 m width strip along the transmission line is shown in **Figure 5.7.2 (a) to (h)**. In the ROW which is part of this strip, more than 80% of the soils have two or three serious to severe limitations (Classes 5td, 5td-4te), mainly due to steep terrains/topography (t), shallow depth and severe erosion hazard (**Table 5.7.3**). Hence, the lands with such soils are unfeasible for agricultural activities.

Table 5.7.3: Agricultural Capability of Soil within ROW

Class	Area (ha., est.)	Percentage
3te-2i	52.86	6.0
3te-3iw	2.86	0.3
3te-4te	3.83	0.4
4te	40.46	4.6
4te-3iw	5.69	0.7
4tw-5td	56.67	6.5
5td	154.52	17.7
5td-4te	558.55	63.8
Total	**875.44**	**100**

Plate 5.7.1: Example of mixed crops – pepper vines, banana trees, durian trees and wet paddy planted near Mapai area.

Plate 5.7.2: Example of fish pond, small holder oil palm and rubber plantation near Mapai area.

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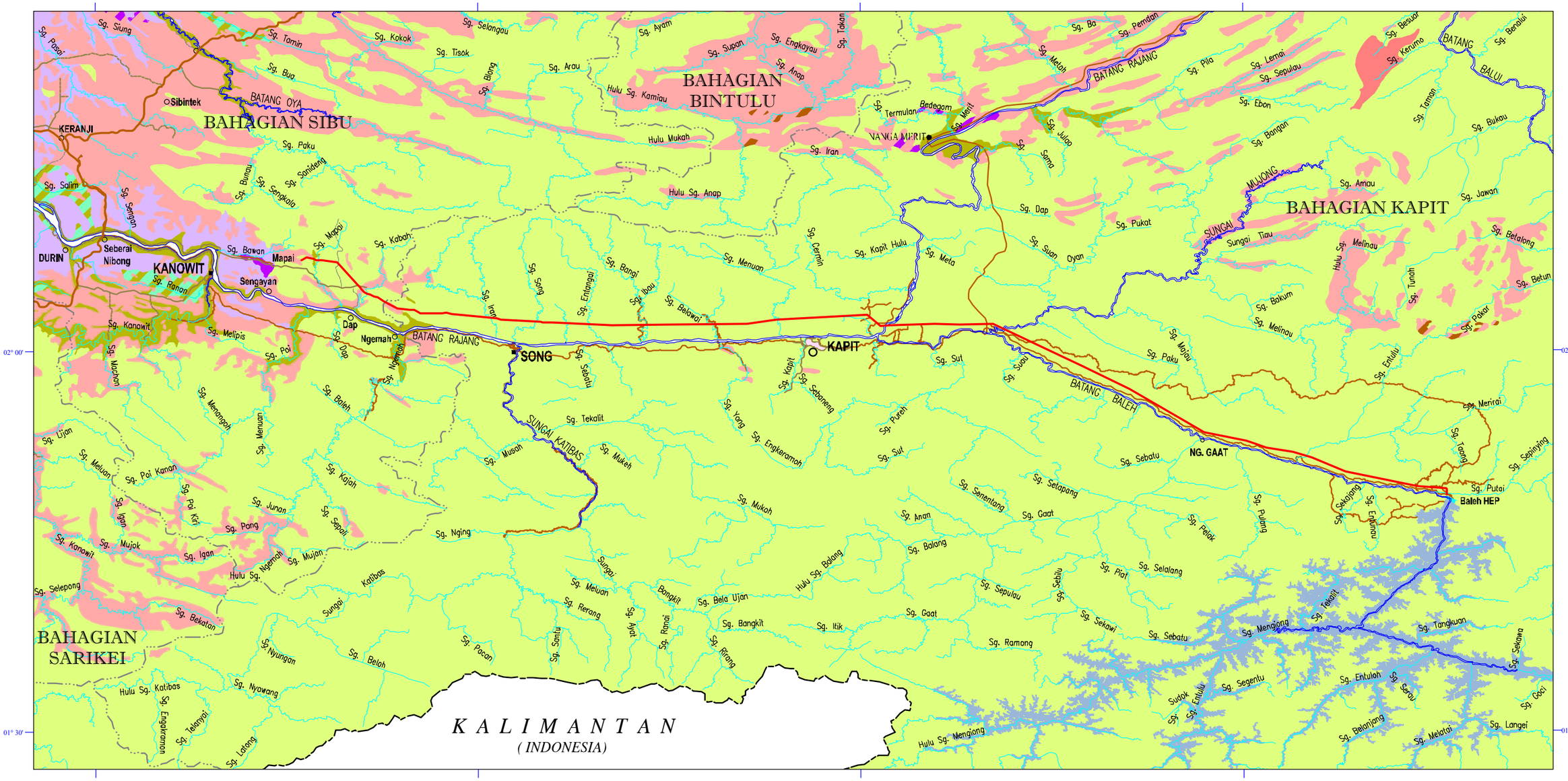


LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- INTERNATIONAL BOUNDARY
- DIVISIONAL BOUNDARY
- BALEH DAM
- BALEH DAM RESERVOIR
- RIVERS / STREAMS
- ROADS / MOTORABLE TRACK

Mainly SKELETAL SOILS and LATERITIC SOILS: shallow to moderately deep, yellow to red clays; on basic to intermediate igneous rocks; steep and moderately steep land. (Equiv: Lithsols, Acrisols, Oxisols)

Mainly SKELETAL SOILS and RED-YELLOW PODZOLIC SOILS: very shallow to moderately deep loamy sands to clays; on sedimentary, acid igneous and metamorphic rocks; steep and mountainous land. (Equiv: Acrisols, Ferralsols)

Mainly RED-YELLOW PODZOLICSOILS: shallow to deep, yellow red loamy sands to clays; on sedimentary acid igneous and metamorphic rocks; gently sloping to steep land. (Equiv: Acrisols, Ferralsols)

Mainly GREY-WHITE PODZOLIC SOILS: moderately deep to deep, white, grey or pale yellow loamy sands to clays; on sedimentary rocks or old alluvium; flat to moderately steep land. (Equiv: Acrisols, Ferralsols, Planosols)

Mainly PODZOLS: shallow to deep, pale-coloured sands wih prominent sub-surface accumulation of humus or, locally, iron; on old or subrecent alluvium or coarse-textured sedimentary rocks; flat to gently sloping land. (Equiv: Podzils)

Mainly GLEY SOILS: poorly-drained sands to clay; on recent alluvium in floodplain areas; on old alluvium on low-level terraces; on sedimentary rocks on gently undulating land and some dip slopes (Equiv: Gleysols)

Mainly shallow PEAT SOILS (overlying mineral material at less than 1 metre depth); mainly in present floo-plains; locally at high altitude in mountainous land. (Equiv: Histosols)

Mainly deep PEAT SOILS (overlying mineral material at more than 1 metre depth, commonly more than 3 metres); in present floodplains. (Equiv: Histosols)

Soil groups (in capitals above) are locally defined. See A Classification of Sarawak Soils, Department of Agriculture, Sarawak, 1966 and subsequent amendments.

Equivalent groups (in brackets above) are those employed for the First Draft Soil Map of the World. See world Soil Resources Report No.33, F.A.O., 1968. The correlation of Sarawak groups in this system is tentative, and particularly doubtful in the case of Grey-White Podzolic Soils.

The components of compound mapping units indicate important groups within the unit and need not indicate the full range of groups present. Considerable generalization has been necessary as this mapping scale, particularly in lowland and floodplain areas.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE PROPOSED BALEH-MAPAI 500 KV TRANSMISSION LINE PROJECT

N

0 10 20 30 40Km

SCALE IN KILOMETRES (1:600,000) – A3 MEDIUM

NOTE
-The outer ticks indicate the Latitude and Longitude

SOURCE: Adapted from

SERIES 8 EDITION 8 SCALE 1:500,000	SOIL MAP OF SARAWAK MALAYSIA TIMOR 1968 DEPARTMENT OF AGRICULTURE, KUCHING, SARAWAK, MALAYSIA SCALE 1:500,000

SOIL TYPES ALONG THE TRANSMISSION LINE ALIGNMENT

FIGURE: 5.7.1

D:\ACAD\DRAWINGS\EV103\792\FIG-571.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE PROPOSED BALEH MAPAI 500 KV TRANSMISSION LINE PROJECT

LIMITATIONS TO AGRICULTURAL CROPS	
SYMBOL	LIMITATIONS (recognised at subclass level)
d	Soil depth to impervious layer
e	Erosion hazard
i	Inundation
t	Topography
w	Wetness

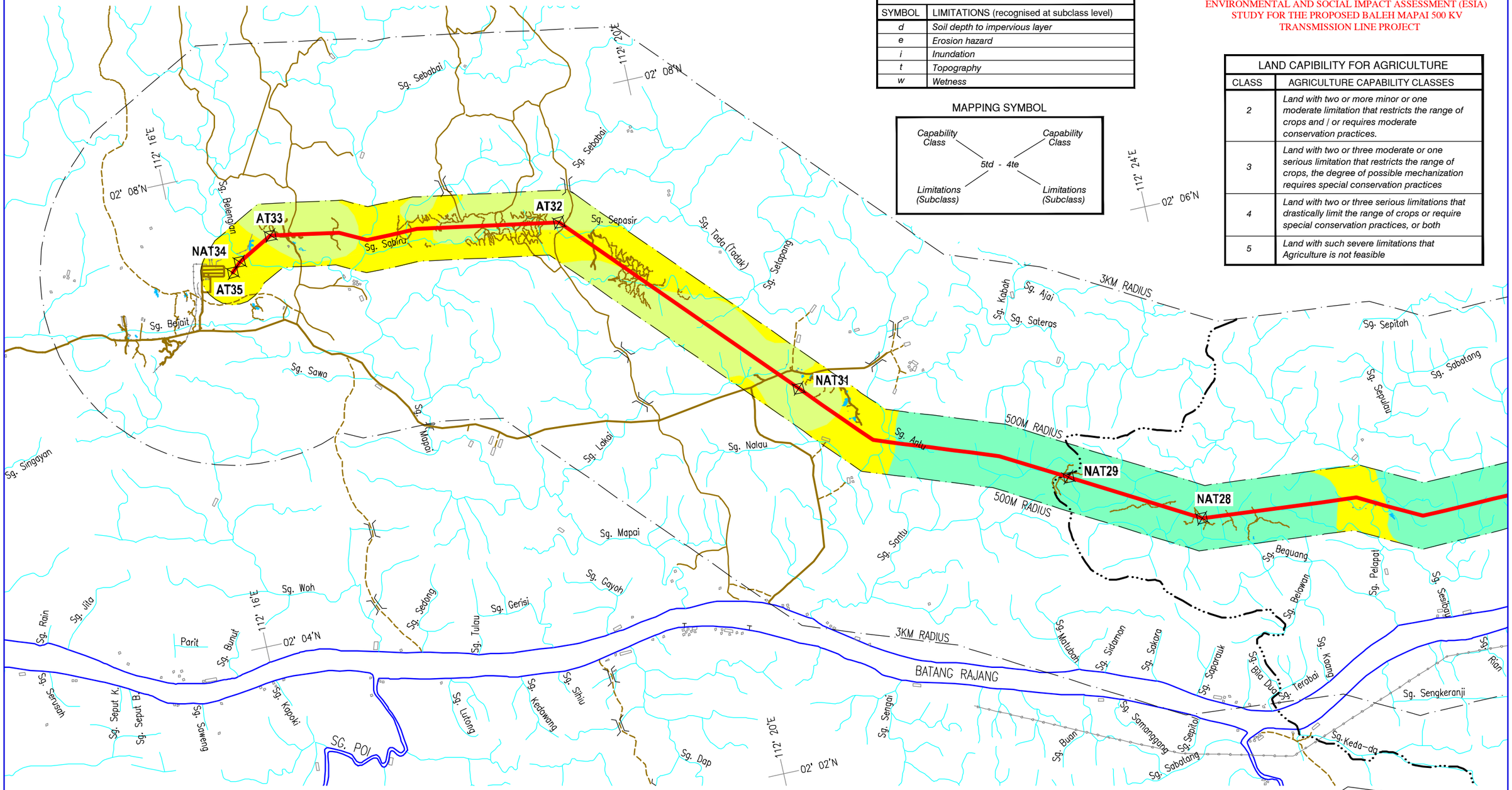
MAPPING SYMBOL

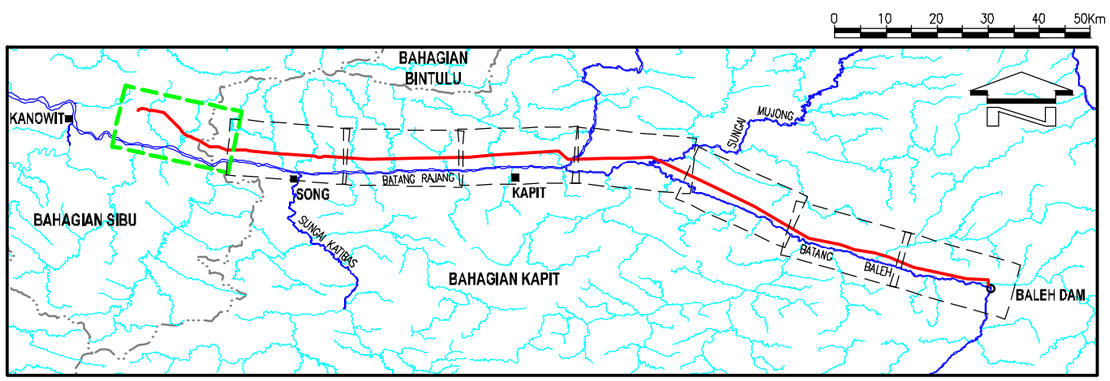
Capability Class — Capability Class

5td - 4te

Limitations (Subclass) — Limitations (Subclass)

LAND CAPIBILITY FOR AGRICULTURE	
CLASS	AGRICULTURE CAPABILITY CLASSES
2	Land with two or more minor or one moderate limitation that restricts the range of crops and / or requires moderate conservation practices.
3	Land with two or three moderate or one serious limitation that restricts the range of crops, the degree of possible mechanization requires special conservation practices
4	Land with two or three serious limitations that drastically limit the range of crops or require special conservation practices, or both
5	Land with such severe limitations that Agriculture is not feasible





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- DIVISIONAL BOUNDARY
- EXISTING TRANSMISSION LINE
- BRIDGE

- 3te-2i
- 3te-3iw
- 3te-4te
- 4te
- 4te-3iw
- 4te-5td
- 5td
- 5td-4te

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

JR D

-The inner crosses indicate the Latitude and Longitude

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

DEPARTMENT OF AGRICULTURE, SARAWAK, 1982
AGRICULTURE CAPABILITY MAP 2
SCALE 1:250,000

DEPARTMENT OF AGRICULTURE, SARAWAK, 1980
AGRICULTURE CAPABILITY MAP 5
SCALE 1:250,000

AGRICULTURAL CAPABILITY OF SOILS ALONG THE TRANSMISSION LINE (1000m WIDTH STRIP)

FIGURE: 5.7.2a

D:\ACAD\DRAWINGS\EV103\792\FIG-572a_572h.DWG

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT

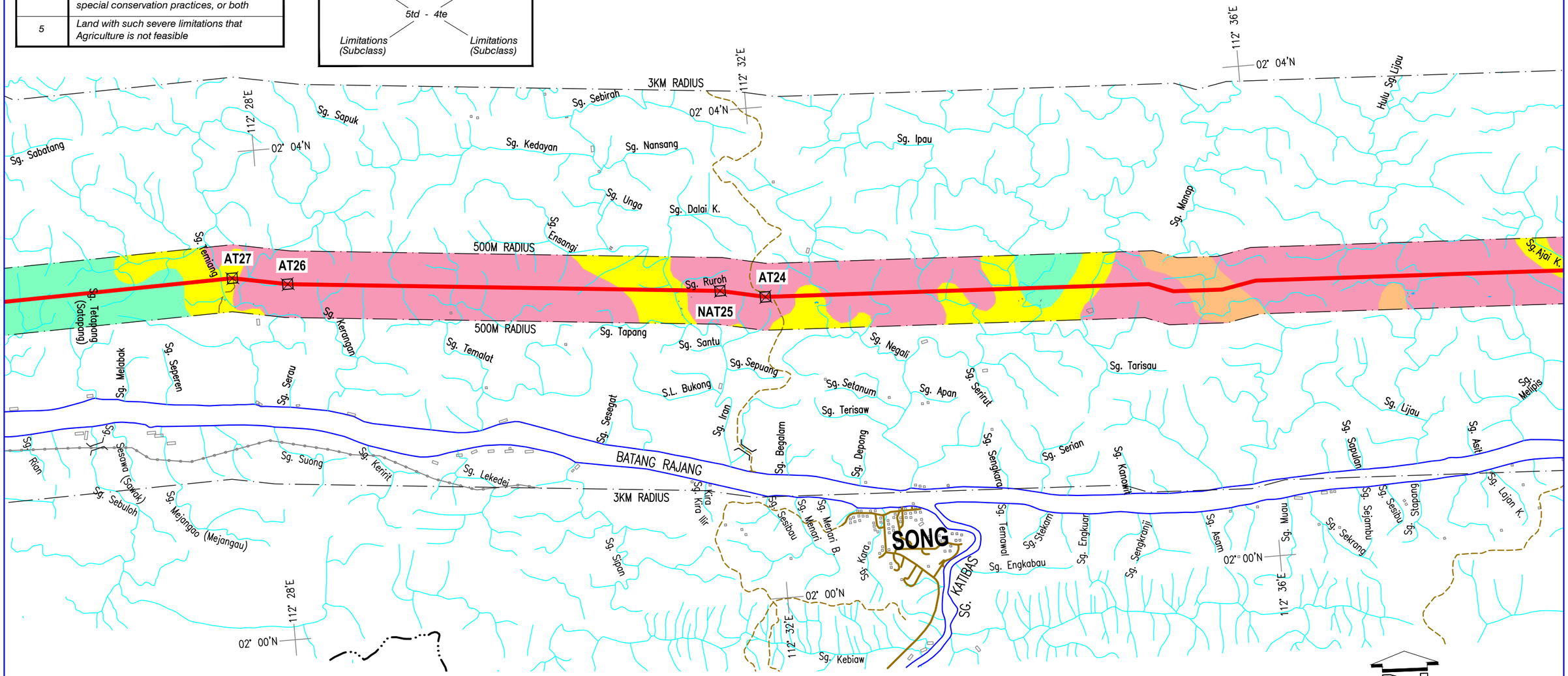
LAND CAPIBILITY FOR AGRICULTURE	
CLASS	AGRICULTURE CAPABILITY CLASSES
2	*Land with two or more minor or one moderate limitation that restricts the range of crops and / or requires moderate conservation practices.*
3	*Land with two or three moderate or one serious limitation that restricts the range of crops, the degree of possible mechanization requires special conservation practices*
4	*Land with two or three serious limitations that drastically limit the range of crops or require special conservation practices, or both*
5	*Land with such severe limitations that Agriculture is not feasible*

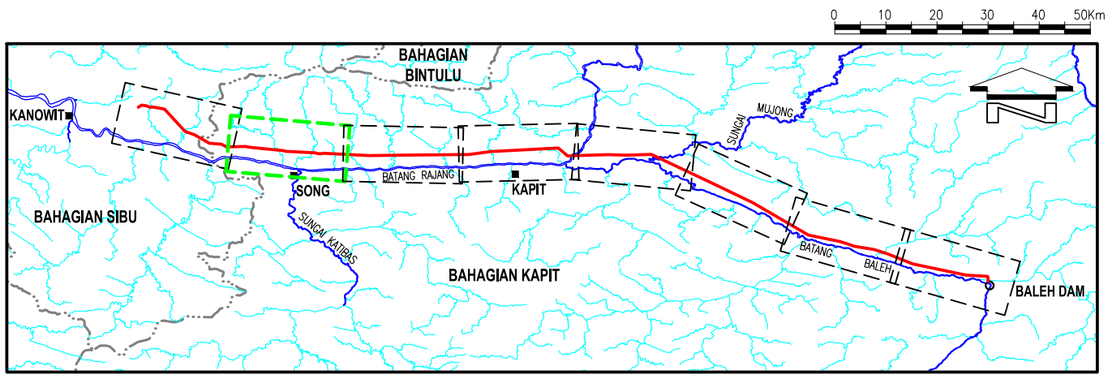
LIMITATIONS TO AGRICULTURAL CROPS	
SYMBOL	LIMITATIONS (recognised at subclass level)
d	*Soil depth to impervious layer*
e	*Erosion hazard*
i	*Inundation*
t	*Topography*
w	*Wetness*

MAPPING SYMBOL

Capability Class — *Capability Class*
5td - 4te
Limitations (Subclass) — *Limitations (Subclass)*

NOTE: Where two capability classess occur in association, the dominant one is indicate first (e.g 5td is dominant in mapping unit 5td-4te).





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- DIVISIONAL BOUNDARY
- EXISTING TRANSMISSION LINE
- BRIDGE

- 3te-2i
- 3te-3iw
- 3te-4te
- 4te
- 4te-3iw
- 4te-5td
- 5td
- 5td-4te

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

GRID
–The inner crosses indicate the Latitude and Longitude

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

DEPARTMENT OF AGRICULTURE, SARAWAK, 1982
AGRICULTURE CAPABILITY MAP 2
SCALE 1:250,000

DEPARTMENT OF AGRICULTURE, SARAWAK, 1980
AGRICULTURE CAPABILITY MAP 5
SCALE 1:250,000

AGRICULTURAL CAPABILITY OF SOILS ALONG THE TRANSMISSION LINE (1000m WIDTH STRIP)

FIGURE: 5.7.2b

D:\ACAD\DRAWINGS\EV103\792\FIG-572a_572h.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT

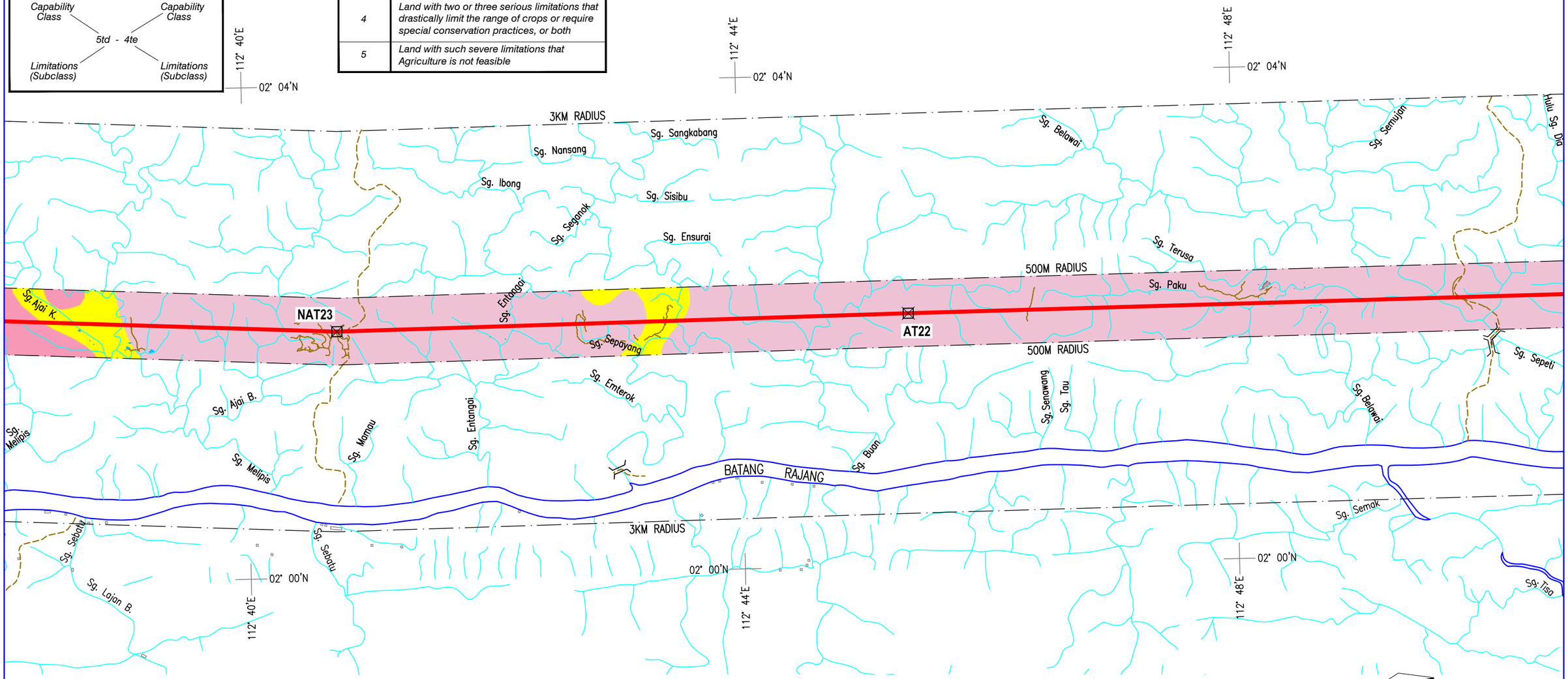
LIMITATIONS TO AGRICULTURAL CROPS	
SYMBOL	LIMITATIONS (recognised at subclass level)
d	Soil depth to impervious layer
e	Erosion hazard
i	Inundation
t	Topography
w	Wetness

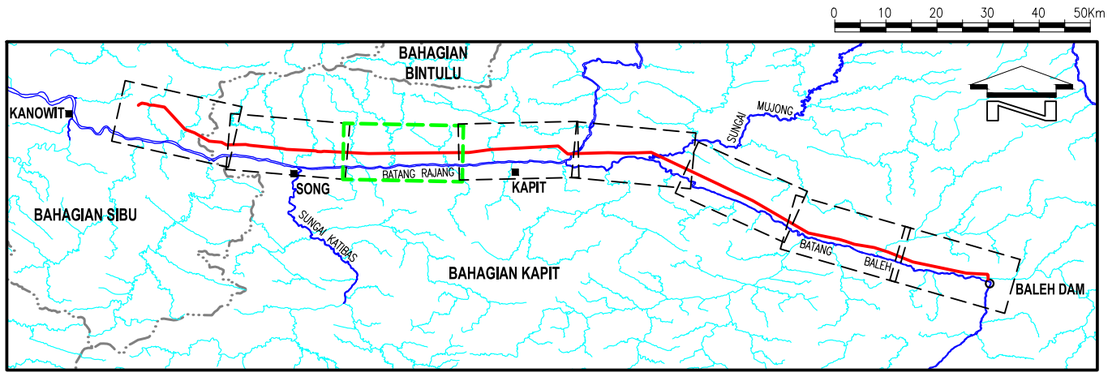
MAPPING SYMBOL

Capability Class — Capability Class
5td - 4te
Limitations (Subclass) — Limitations (Subclass)

LAND CAPIBILITY FOR AGRICULTURE	
CLASS	AGRICULTURE CAPABILITY CLASSES
2	Land with two or more minor or one moderate limitation that restricts the range of crops and / or requires moderate conservation practices.
3	Land with two or three moderate or one serious limitation that restricts the range of crops, the degree of possible mechanization requires special conservation practices
4	Land with two or three serious limitations that drastically limit the range of crops or require special conservation practices, or both
5	Land with such severe limitations that Agriculture is not feasible

NOTE: Where two capability classess occur in association, the dominant one is indicate first (e.g 5td is dominant in mapping unit 5td-4te).





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- BRIDGE

- 3te-2i
- 3te-3iw
- 3te-4te
- 4te
- 4te-3iw
- 4te-5td
- 5td
- 5td-4te

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

GRID
–The inner crosses indicate the Latitude and Longitude

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

DEPARTMENT OF AGRICULTURE, SARAWAK, 1982
AGRICULTURE CAPABILITY MAP 2
SCALE 1:250,000

DEPARTMENT OF AGRICULTURE, SARAWAK, 1980
AGRICULTURE CAPABILITY MAP 5
SCALE 1:250,000

AGRICULTURAL CAPABILITY OF SOILS ALONG THE TRANSMISSION LINE (1000m WIDTH STRIP)

FIGURE: 5.7.2c

D:\ACAD\DRAWINGS\EV103\792\FIG-572a_572h.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT

LAND CAPIBILITY FOR AGRICULTURE	
CLASS	AGRICULTURE CAPABILITY CLASSES
2	*Land with two or more minor or one moderate limitation that restricts the range of crops and / or requires moderate conservation practices.*
3	*Land with two or three moderate or one serious limitation that restricts the range of crops, the degree of possible mechanization requires special conservation practices*
4	*Land with two or three serious limitations that drastically limit the range of crops or require special conservation practices, or both*
5	*Land with such severe limitations that Agriculture is not feasible*

LIMITATIONS TO AGRICULTURAL CROPS	
SYMBOL	LIMITATIONS (recognised at subclass level)
d	*Soil depth to impervious layer*
e	*Erosion hazard*
i	*Inundation*
t	*Topography*
w	*Wetness*

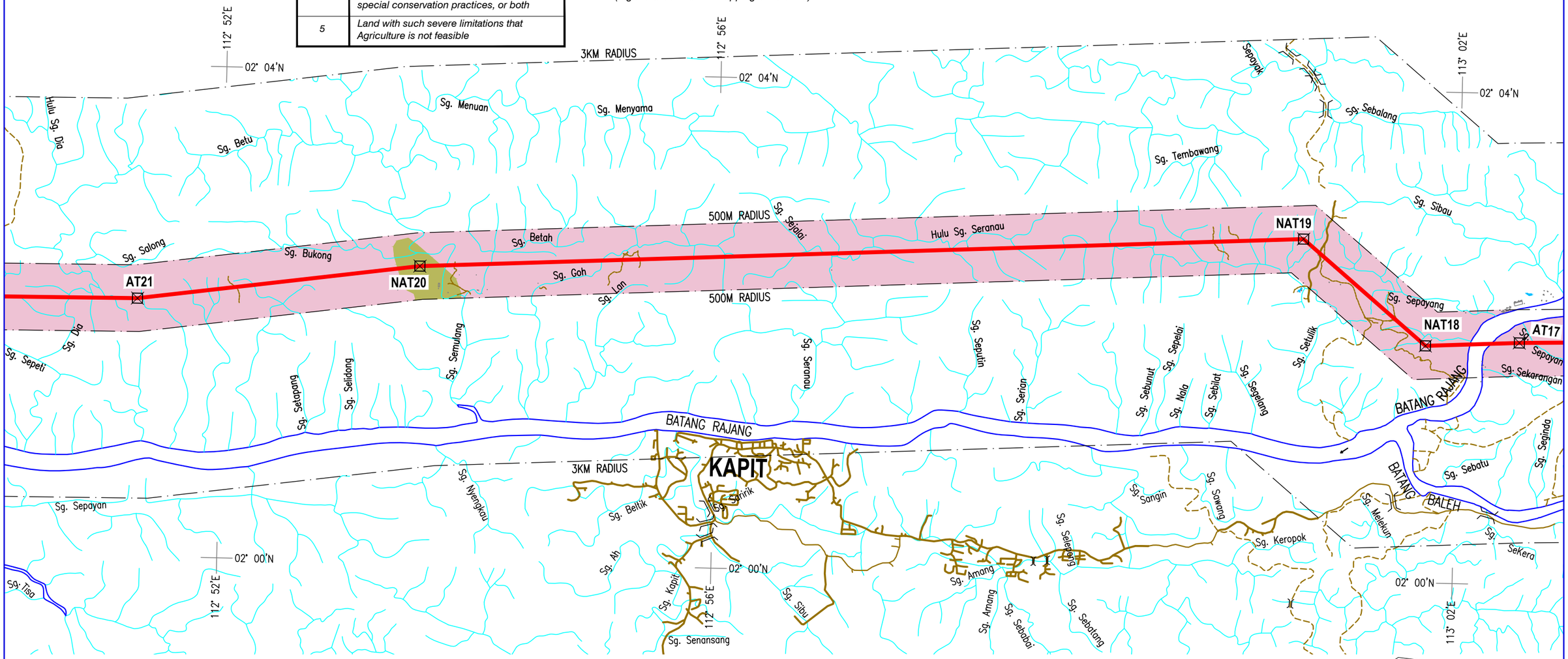
MAPPING SYMBOL

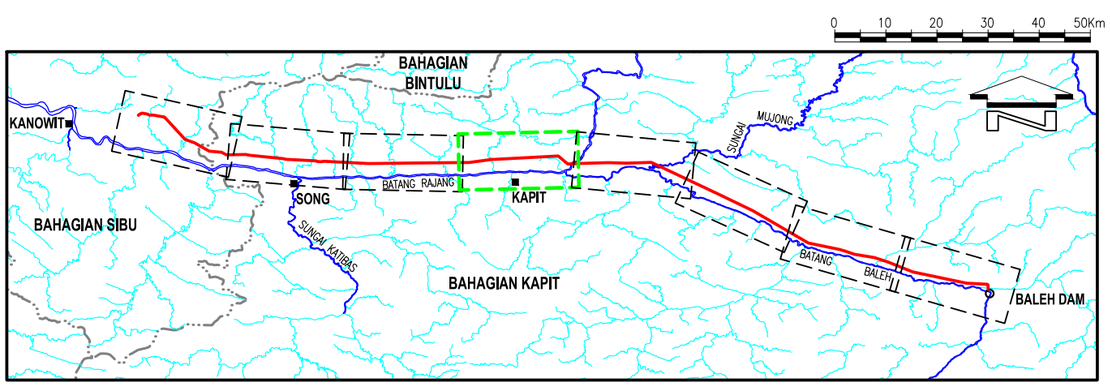
Capability Class — *Capability Class*

5td - 4te

Limitations (Subclass) — *Limitations (Subclass)*

NOTE: Where two capability classess occur in association, the dominant one is indicate first (e.g 5td is dominant in mapping unit 5td-4te).





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- BRIDGE

- 3te-2i
- 3te-3iw
- 3te-4te
- 4te
- 4te-3iw
- 4te-5td
- 5td
- 5td-4te

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

DEPARTMENT OF AGRICULTURE, SARAWAK, 1982
AGRICULTURE CAPABILITY MAP 2
SCALE 1:250,000

DEPARTMENT OF AGRICULTURE, SARAWAK, 1980
AGRICULTURE CAPABILITY MAP 5
SCALE 1:250,000

AGRICULTURAL CAPABILITY OF SOILS ALONG THE TRANSMISSION LINE (1000m WIDTH STRIP)

FIGURE: 5.7.2d

D:\ACAD\DRAWINGS\EV103\792\FIG-572a_572h.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE PROPOSED BALEH MAPAI 500 KV TRANSMISSION LINE PROJECT

LAND CAPIBILITY FOR AGRICULTURE	
CLASS	AGRICULTURE CAPABILITY CLASSES
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4	*Land with two or three serious limitations that drastically limit the range of crops or require special conservation practices, or both*
5	*Land with such severe limitations that Agriculture is not feasible*

LIMITATIONS TO AGRICULTURAL CROPS	
SYMBOL	LIMITATIONS (recognised at subclass level)
d	*Soil depth to impervious layer*
e	*Erosion hazard*
i	*Inundation*
t	*Topography*
w	*Wetness*

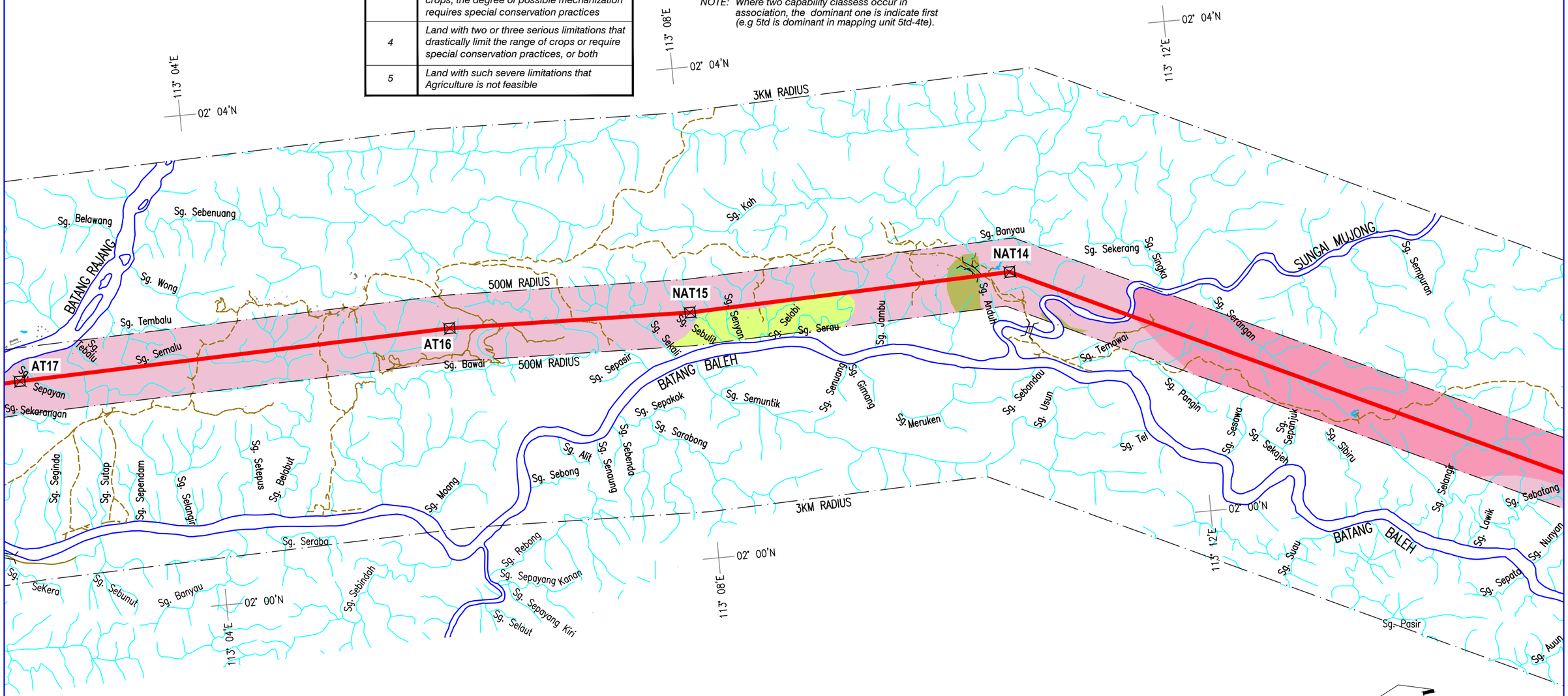
MAPPING SYMBOL

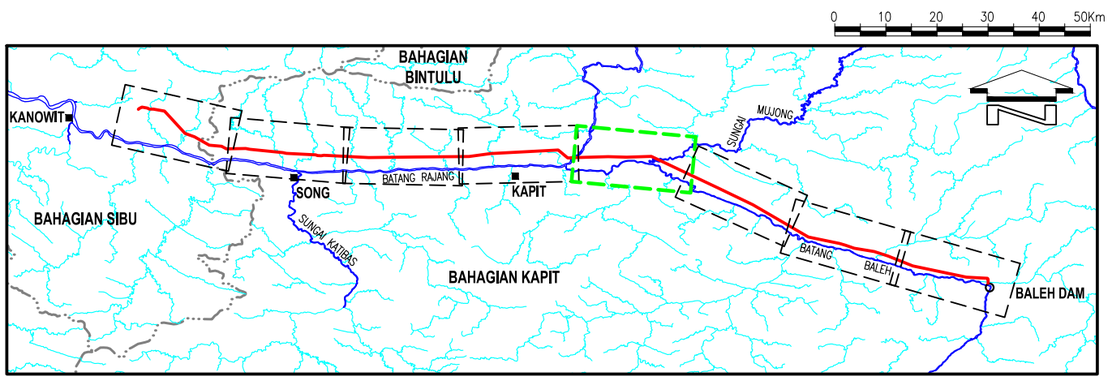
Capability Class — *Capability Class*

5td - 4te

Limitations (Subclass) — *Limitations (Subclass)*

NOTE: Where two capability classess occur in association, the dominant one is indicate first (e.g 5td is dominant in mapping unit 5td-4te).





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS

- 3te-2i
- 3te-3iw
- 3te-4te
- 4te
- 4te-3iw
- 4te-5td
- 5td
- 5td-4te

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

GRID

–The inner crosses indicate the Latitude and Longitude

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

DEPARTMENT OF AGRICULTURE, SARAWAK, 1982
AGRICULTURE CAPABILITY MAP 2
SCALE 1:250,000

DEPARTMENT OF AGRICULTURE, SARAWAK, 1980
AGRICULTURE CAPABILITY MAP 5
SCALE 1:250,000

AGRICULTURAL CAPABILITY OF SOILS ALONG THE TRANSMISSION LINE (1000m WIDTH STRIP)

FIGURE: 5.7.2e

D:\ACAD\DRAWINGS\EV103\792\FIG-572a_572h.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT

LAND CAPIBILITY FOR AGRICULTURE	
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LIMITATIONS TO AGRICULTURAL CROPS	
SYMBOL	LIMITATIONS (recognised at subclass level)
d	*Soil depth to impervious layer*
e	*Erosion hazard*
i	*Inundation*
t	*Topography*
w	*Wetness*

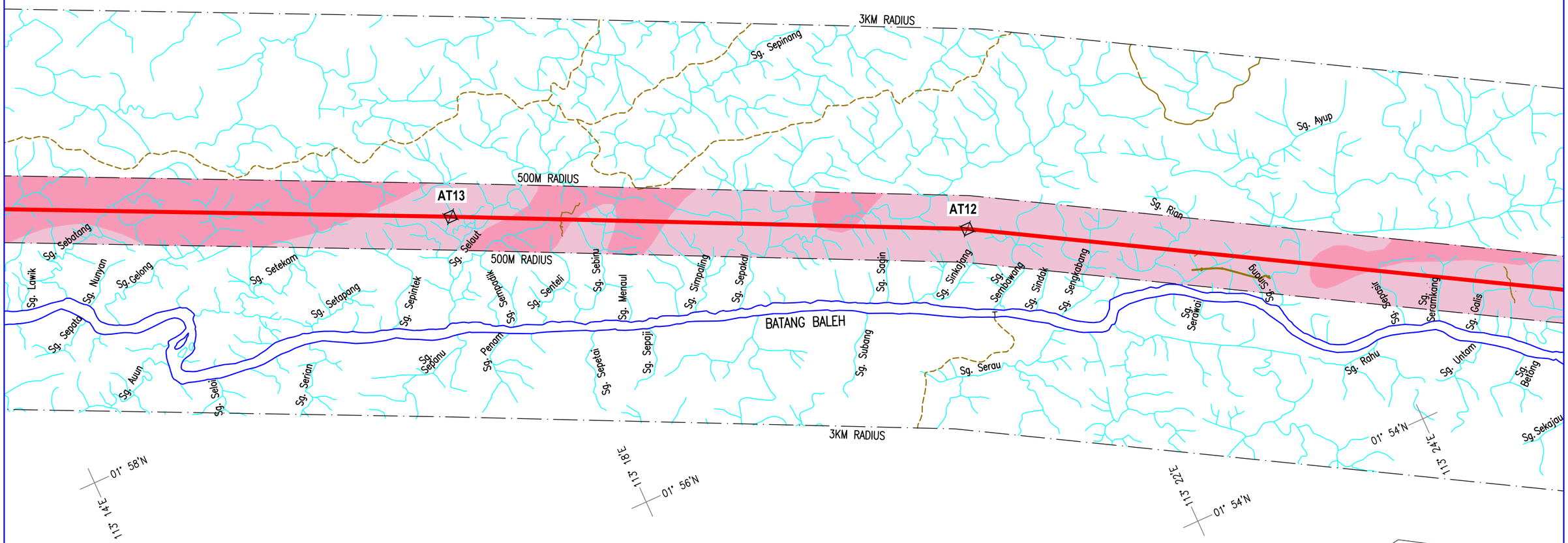
NOTE: Where two capability classess occur in association, the dominant one is indicate first (e.g 5td is dominant in mapping unit 5td-4te).

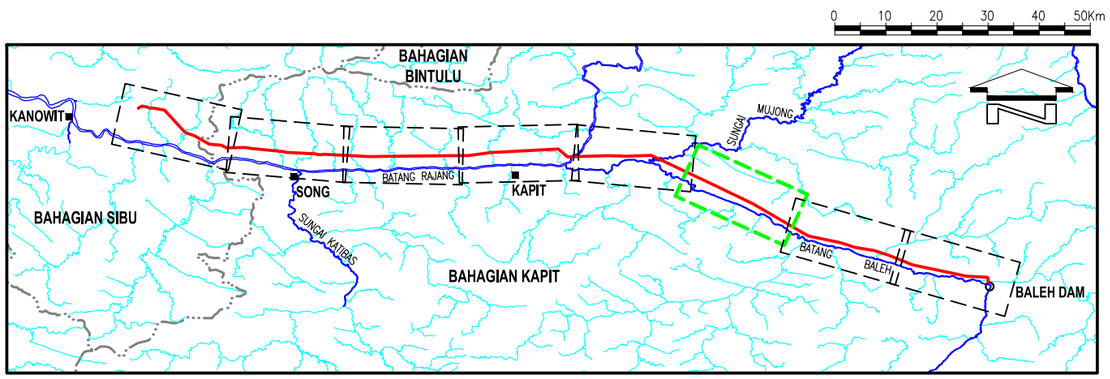
MAPPING SYMBOL

Capability Class — *Capability Class*

5td - 4te

Limitations (Subclass) — *Limitations (Subclass)*





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS

- 3te-2i
- 3te-3iw
- 3te-4te
- 4te
- 4te-3iw
- 4te-5td
- 5td
- 5td-4te

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

GRID
–The inner crosses indicate the Latitude and Longitude

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

DEPARTMENT OF AGRICULTURE, SARAWAK, 1982
AGRICULTURE CAPABILITY MAP 2
SCALE 1:250,000

DEPARTMENT OF AGRICULTURE, SARAWAK, 1980
AGRICULTURE CAPABILITY MAP 5
SCALE 1:250,000

AGRICULTURAL CAPABILITY OF SOILS ALONG THE TRANSMISSION LINE (1000m WIDTH STRIP)

FIGURE: 5.7.2f

D:\ACAD\DRAWINGS\EV103\792\FIG-572a_572h.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT

LAND CAPIBILITY FOR AGRICULTURE	
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LIMITATIONS TO AGRICULTURAL CROPS	
SYMBOL	LIMITATIONS (recognised at subclass level)
d	*Soil depth to impervious layer*
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i	*Inundation*
t	*Topography*
w	*Wetness*

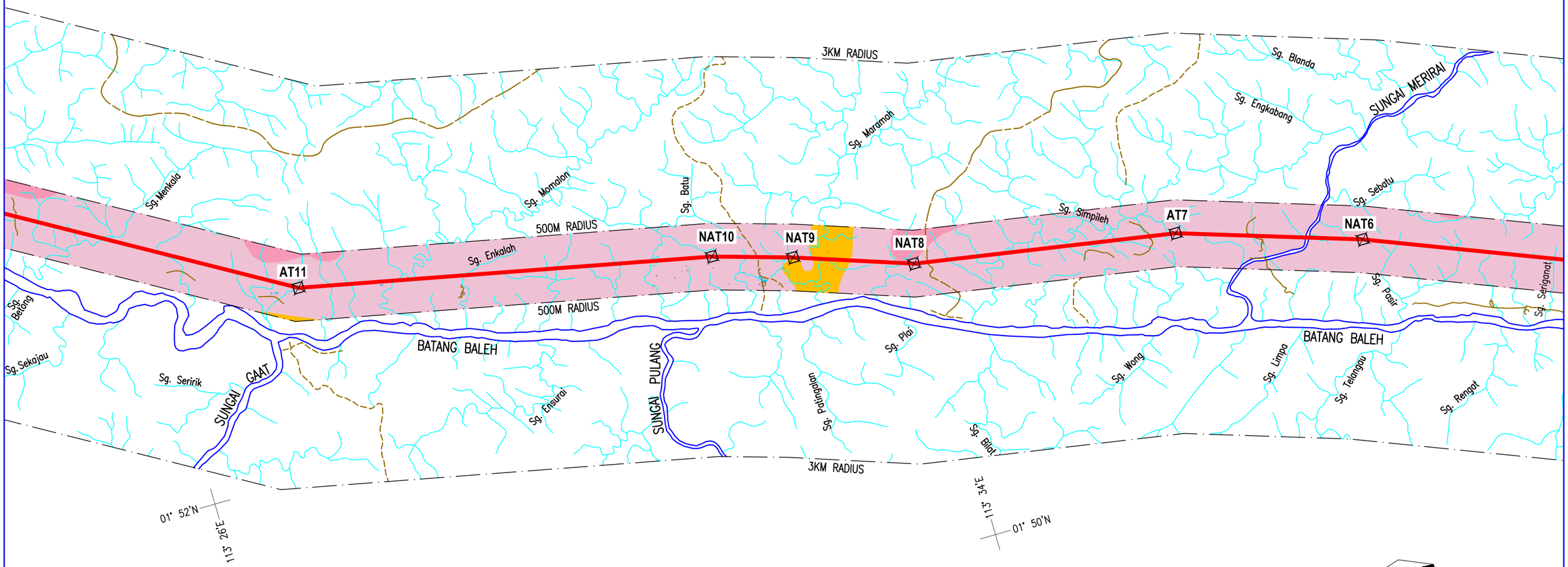
NOTE: Where two capability classess occur in association, the dominant one is indicate first (e.g 5td is dominant in mapping unit 5td-4te).

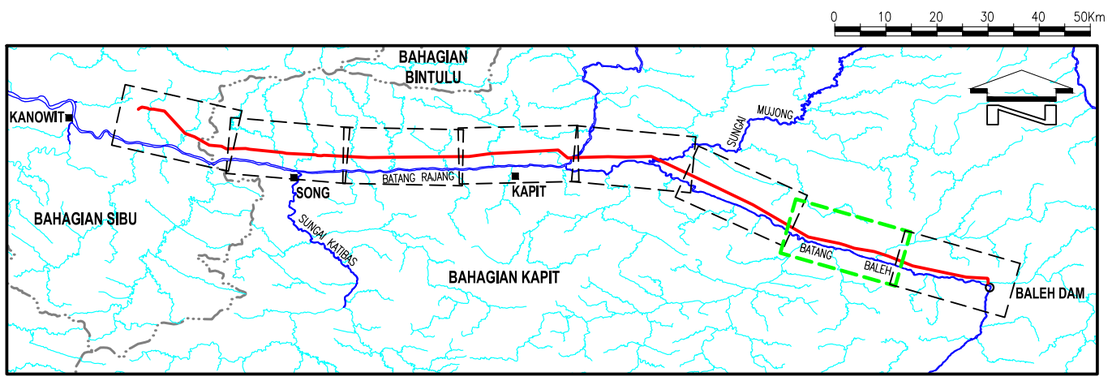
MAPPING SYMBOL

Capability Class — *Capability Class*

5td - 4te

Limitations (Subclass) — *Limitations (Subclass)*





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS

- 3te-2i
- 3te-3iw
- 3te-4te
- 4te
- 4te-3iw
- 4te-5td
- 5td
- 5td-4te

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

GRID
–The inner crosses indicate the Latitude and Longitude

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

DEPARTMENT OF AGRICULTURE, SARAWAK, 1982
AGRICULTURE CAPABILITY MAP 2
SCALE 1:250,000

DEPARTMENT OF AGRICULTURE, SARAWAK, 1980
AGRICULTURE CAPABILITY MAP 5
SCALE 1:250,000

AGRICULTURAL CAPABILITY OF SOILS ALONG THE TRANSMISSION LINE (1000m WIDTH STRIP)

FIGURE: 5.7.2g

D:\ACAD\DRAWINGS\EV103\792\FIG-572a_572h.DWG

CHEMSAIN KONSULTANT SDN. BHD.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT

LAND CAPIBILITY FOR AGRICULTURE	
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i	*Inundation*
t	*Topography*
w	*Wetness*

MAPPING SYMBOL

Capability Class — *Capability Class*

5td - 4te

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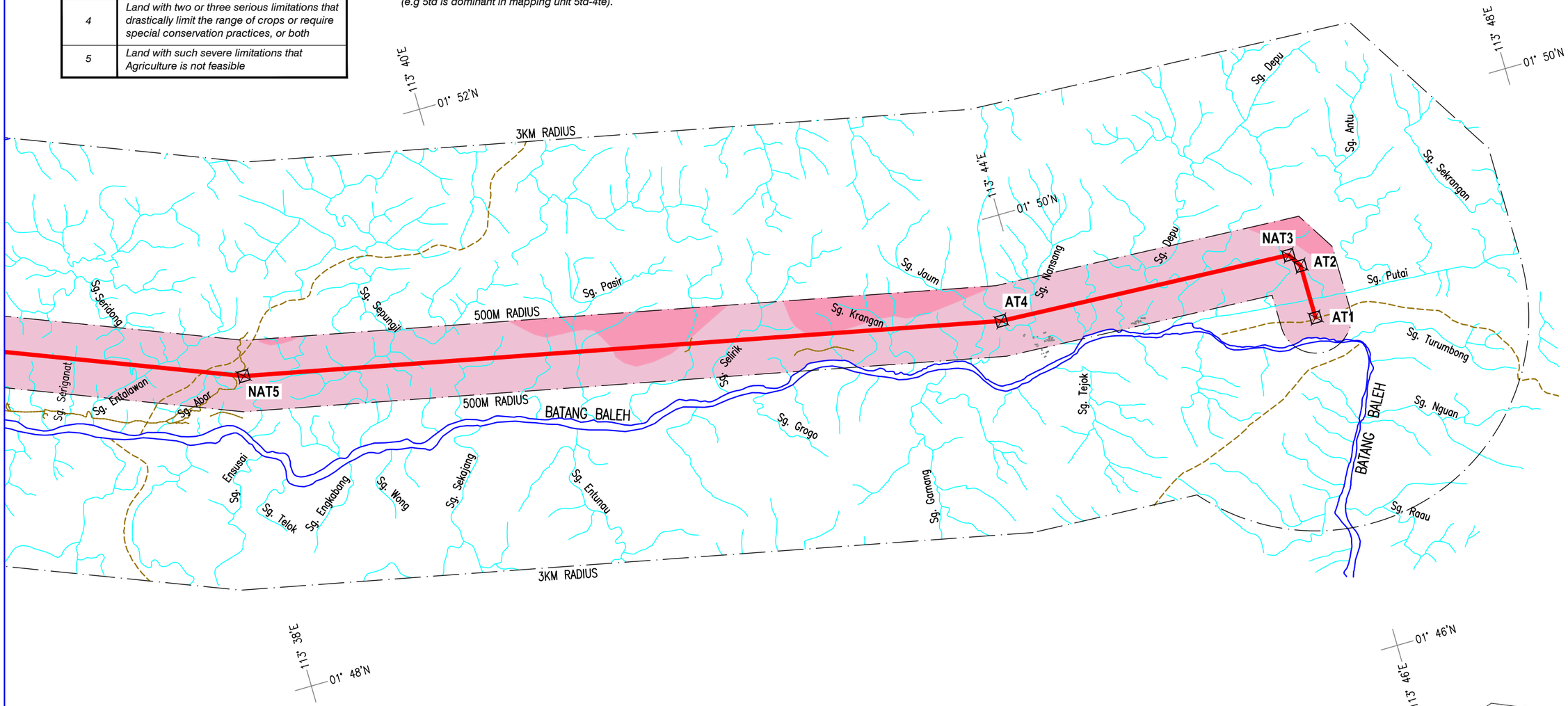
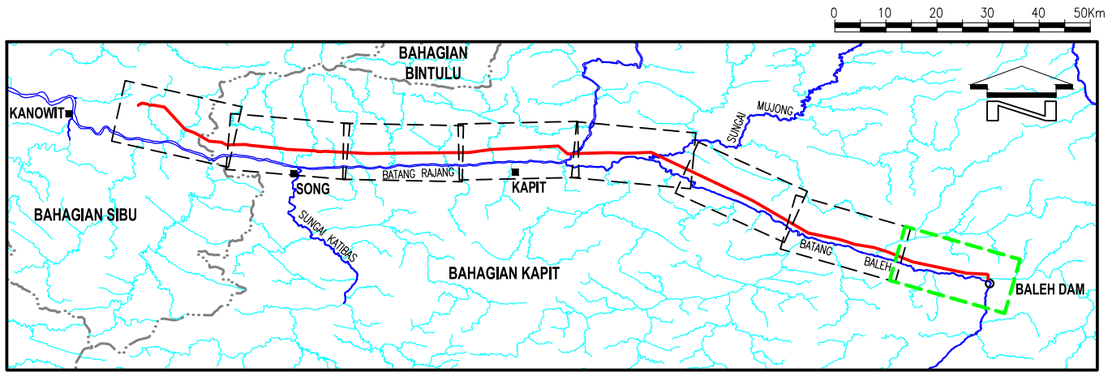
NOTE: Where two capability classess occur in association, the dominant one is indicate first (e.g 5td is dominant in mapping unit 5td-4te).





LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS

- 3te-2i
- 3te-3iw
- 3te-4te
- 4te
- 4te-3iw
- 4te-5td
- 5td
- 5td-4te

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

GRID
–The inner crosses indicate the Latitude and Longitude

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

DEPARTMENT OF AGRICULTURE, SARAWAK, 1982
AGRICULTURE CAPABILITY MAP 2
SCALE 1:250,000

DEPARTMENT OF AGRICULTURE, SARAWAK, 1980
AGRICULTURE CAPABILITY MAP 5
SCALE 1:250,000

AGRICULTURAL CAPABILITY OF SOILS ALONG THE TRANSMISSION LINE (1000m WIDTH STRIP)

FIGURE: 5.7.2h

D:\ACAD\DRAWINGS\EV103\792\FIG-572a_572h.DWG

5.8 HYDROLOGY

5.8.1 River System

Btg. Rajang basin is the largest river basin in Sarawak with a drainage basin of about 51,153.29 km^2 (Department of Irrigation and Drainage Sarawak, n.d.), covering about 40% of the land area of Sarawak and about 7% of that of Borneo (Parenti & Lim, 2005).

The proposed transmission line lies within the Btg. Rajang basin. Btg. Rajang along with its main tributaries is 560 km long and it is the longest river in Malaysia. These rivers flow through Kapit Division and discharges into the South China Sea. The discharge rate for Btg. Rajang is up to 6,000 m3/s in the wet season (December to March), with an average discharge of approximately 3,600 m3/s (Staub et al., 2000).

Btg. Baleh is one of the several main tributaries of Btg. Rajang. Downstream of the proposed Baleh HEP, Btg. Baleh flows westward for 97 km before joining with Btg. Rajang[2]. According to the Baleh SEIA (2014), downstream of Btg. Baleh near the confluence with Btg. Rajang (shown by discharge at Teluk Buing Station), a mean monthly flow of 990 m^3/s is observed (July and August). During wetter months (November to January), a mean monthly flow of 1,450 m^3/s is observed.

The proposed transmission line proceeds along the northern bank of Btg. Rajang and crosses Btg. Rajang itself before proceeding along the north bank of Btg. Baleh. The major tributaries located on the northern banks of both rivers, crossed by the proposed transmission line are as follows:

River	Tributaries	Approximate Length (m)	Approximate Width at Transmission Line Crossing (m)
Btg. Rajang	1. Sg. Menuan	42,095	20
	2. Sg. Belawai	16,656	20
	3. Sg. Ibau	36,243	25
	4. Sg. Entangai	28,657	15
	5. Sg. Song	38,300	28
	6. Sg. Iran	30,995	22
	7. Sg. Kabah	23,807	7

[2] SEIA for the Proposed Baleh Hydroelectric Project, Kapit Division, Sarawak (2014)

River	Tributaries	Approximate Length (m)	Approximate Width at Transmission Line Crossing (m)
	8. Sg. Mapai	23,507	10
Btg. Baleh	1. Sg. Putai	52,015	40
	2. Sg. Merirai	61,110	45
	3. Sg. Mujong	89,956	60

Btg. Rajang and its' main tributaries including Btg. Baleh is shown in **Figure 5.8.1** below.

5.8.2 Existing River Usage

Since there are limited road access to the region, Btg. Rajang, Btg. Baleh and their tributaries still play important role as the main transportation medium facilitating access to education, health services and other civic services especially for communities living along the northern bank of the rivers. The river connects remote areas of the region to main urban centres such as Sibu, Kanowit, Song and Kapit. Therefore, longboats and express boats can be frequently seen travelling up and down these rivers.

Riverine fisheries are still carried out by the local communities living along Btg. Rajang, Btg. Baleh and its tributaries. The locals fish regularly for food as well as a source of income in addition to farming.

Plate 5.8.1: A small fishing boat.

Plate 5.8.2: *Ikan* lajong @ buris

There are several raw water intakes for Government operated water treatment plants located along Btg. Rajang and Btg. Baleh. They are Kanowit, Nanga Dap, Song, Kapit, Nanga Beguang and Nanga Entawau water intakes. They are periodically monitored by JBALB (Sarawak Rural Water Supply Department). In

addition, some tributaries along Btg. Rajang and Btg. Baleh are sources of gravity-fed domestic water supplies of the local communities. Treatment of water (gravity fed water) is usually not carried out. The most common treatment is by boiling.

Plate 5.8.3: Kapit Raw Water Intake (Btg. Rajang).

Plate 5.8.4: Raw Water Intake located near SK Nanga Beguang (Btg. Rajang).

Plate 5.8.5: Passenger express boat plying Btg. Rajang.

Plate 5.8.6: Longboat and speedboat is the most common river transportation in Btg. Rajang and Btg. Baleh.

5.8.3 Water Catchment and Gravity Feed Water Catchment

There are several water catchment areas identified surrounding the study area namely Kanowit, Nanga Dap, Nanga Entawau, Song and Kapit water catchment (Gazetted) area. The water catchment areas for Kapit and Kanowit with their respective water intake points are shown in **Figure 5.8.1**. The catchment map however, does not include the water catchment for gravity feed water supply (GFS). The proposed transmission line alignment may not be within all the water catchment areas identified. However, it is still within the stipulated 8 km radius buffer zone boundary from the water intake points by JBALB. **Table 5.8.1** summarises list of potentially affected water intake points whereby the transmission line is within its stipulated 8 km radius buffer.

Table 5.8.1: List of Potentially Affected Water Intake Points

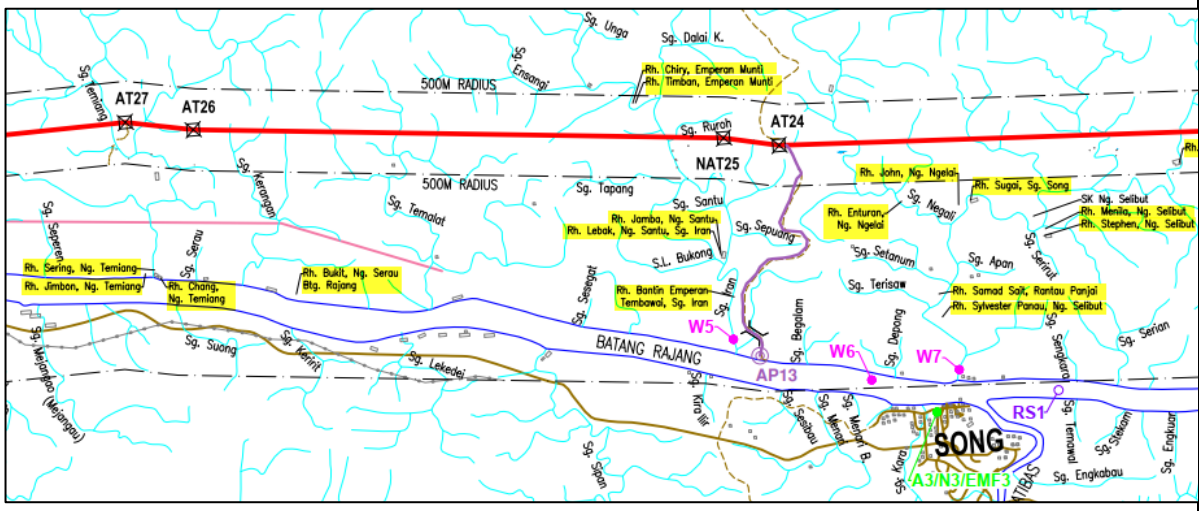
Water Intake Points	Water Catchment
1. Dap	Nanga Dap
2. Nanga Beguang	
3. Kapit	Kapit
4. Song	Song
5. Nanga Entawau	Nanga Entawau
6. Nanga Tada	Nanga Tada
7. Ngemah	Nanga Ngungun

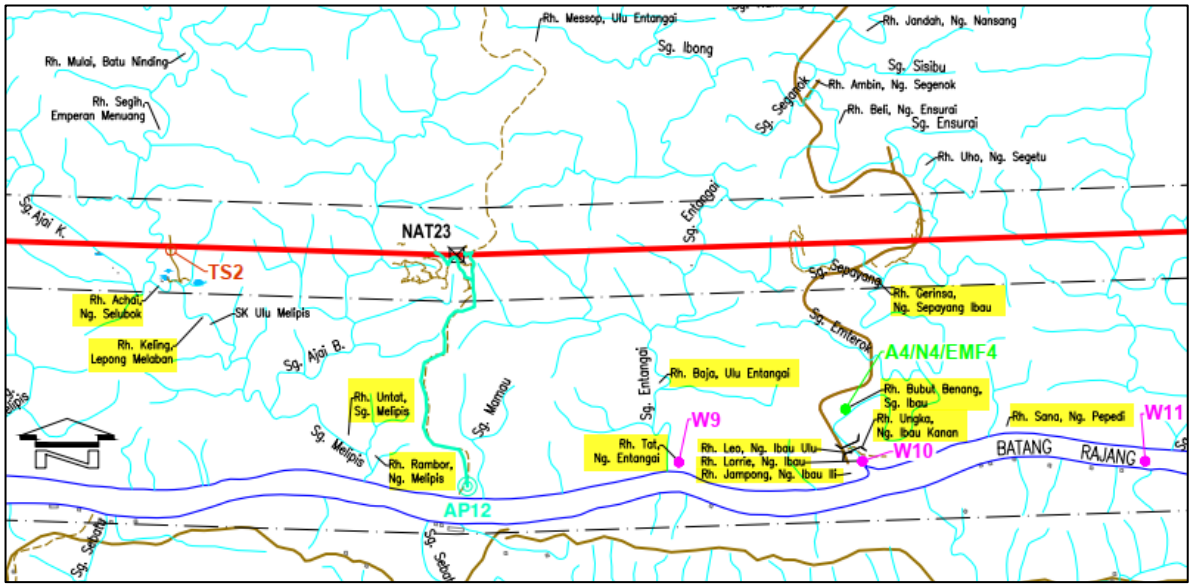
Generally, the source for GFS is usually a spring or small stream located in the upper sub-catchment of the larger catchments. Water catchments of these gravity feed systems are significantly smaller thus less prominent in topographic maps compared to a full river basin. Field demarcation of these catchments is also limited due to the lack of proper procedures and instructions.

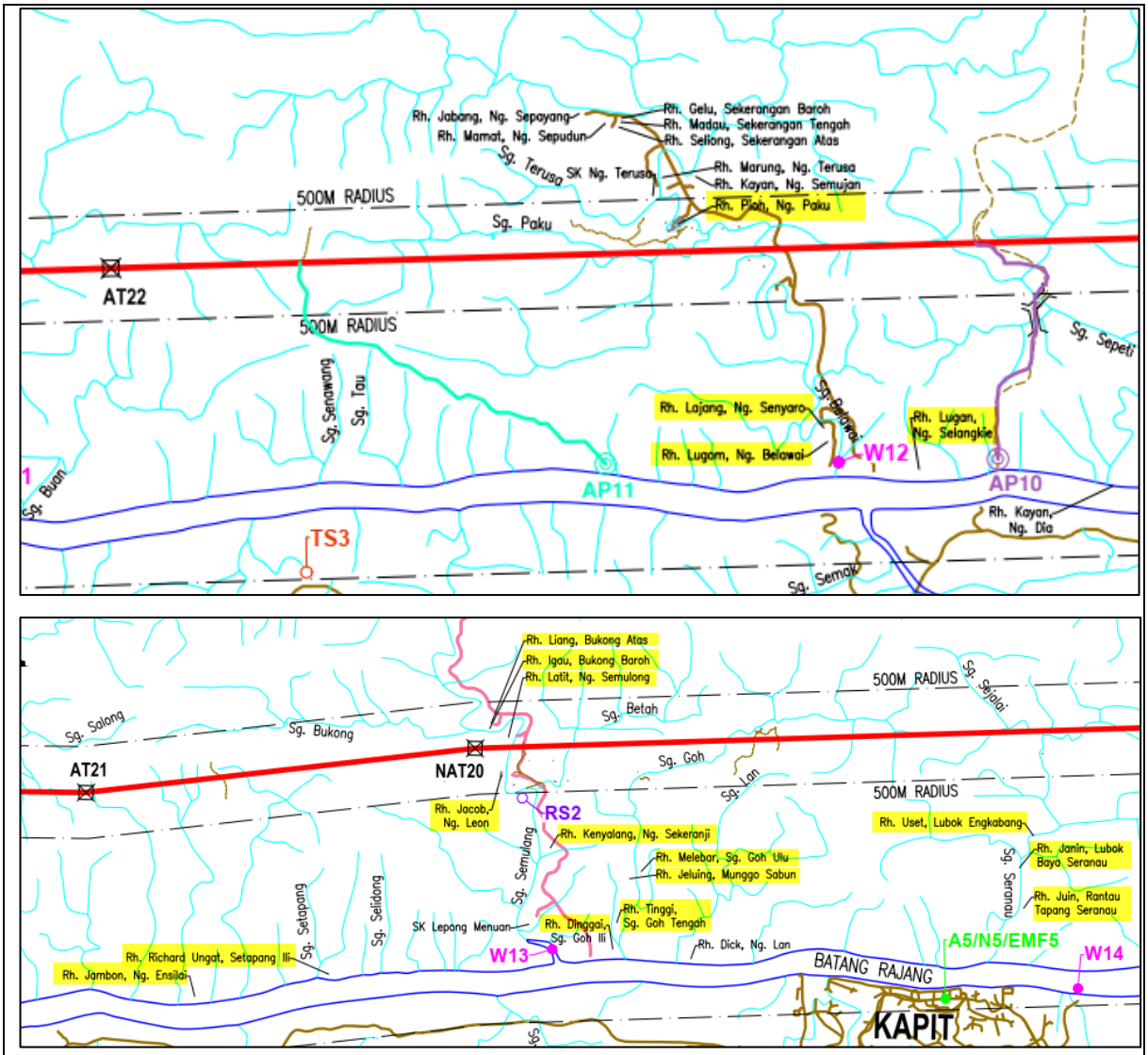
Fieldwork survey revealed that about 85 of the 159 settlements within the 500 m radius and south of the proposed transmission line are dependent on GFS for their daily usage. Any GFS intake catchment or GFS pipelines along and near the work zone are potentially affected during the site preparation and construction stage.

In Sarawak, the State Health Department, District Offices and the Minerals and Geoscience Department Malaysia, Sarawak are several government agencies responsible to carry out the project implementation programs on gravity feed water supply. There are also GFS within FDS licensed areas which through forest management plans are protected to safeguard the water quality to ensure clean water supply to local communities. **Appendix 5.8.1** presents list of longhouses dependent on GFS water supply in Kapit, Song and Kanowit sourced from the above agencies. It is important to note that GFS dependent longhouses located within the study area may not be in the list as the GFS are by their own initiative.

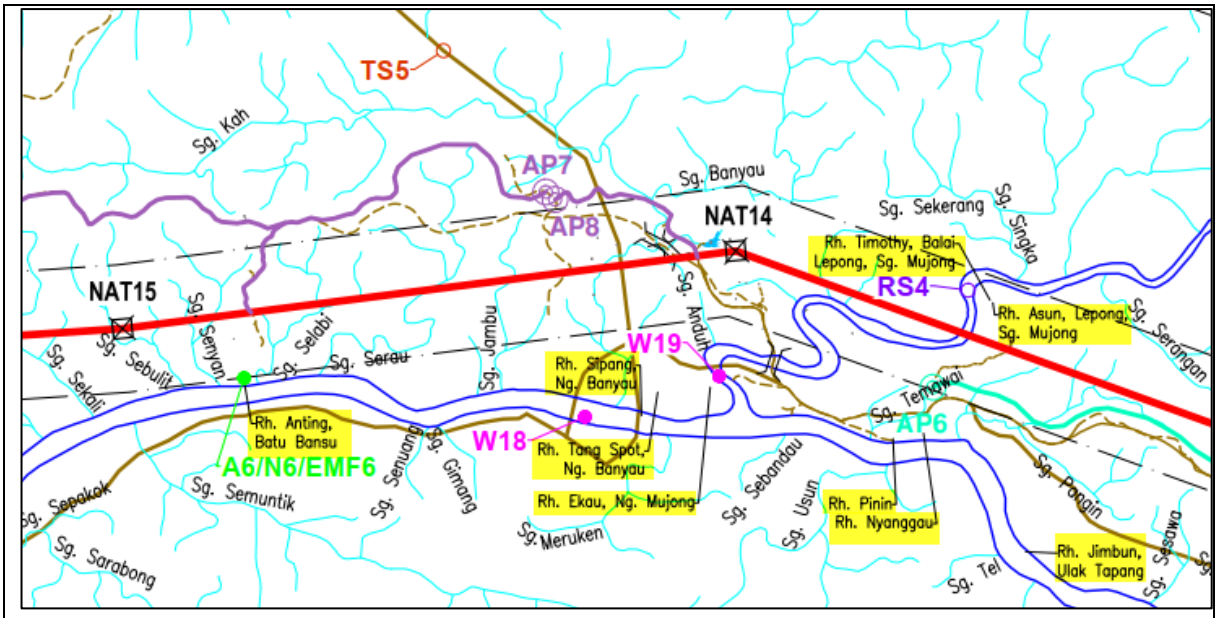
Examples of potentially affected GFS dependent longhouses (highlighted) located within the 500 m radius and south of the transmission line towards Btg. Rajang are as follows:

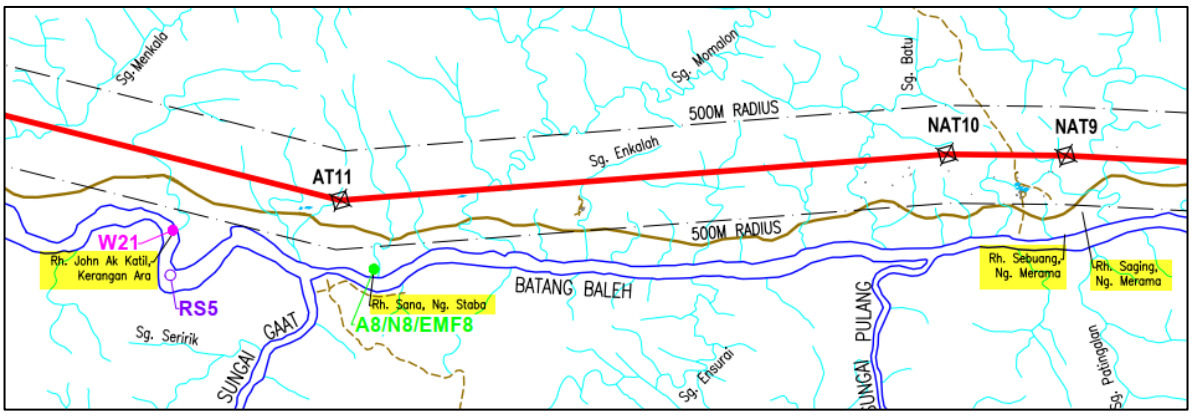


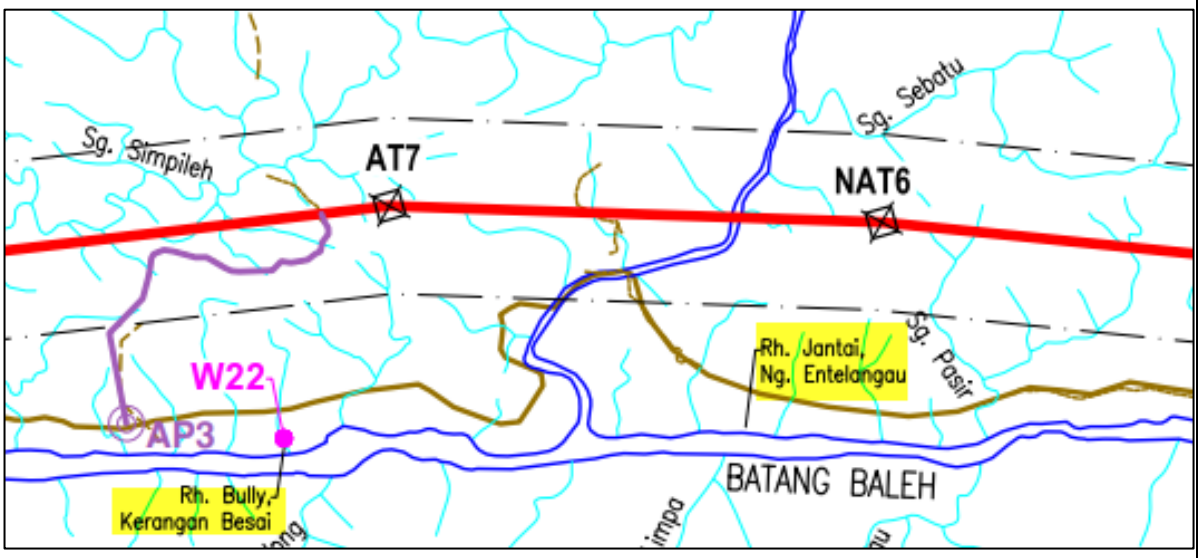




Examples of potentially affected GFS dependent longhouses (highlighted) located within the 500 m radius and south of the transmission line towards Btg. Baleh are as follows:


TS5
Sg. Kah
AP7
AP8
Sg. Banyau
NAT14
Sg. Sekerang
Sg. Singka
Rh. Timothy, Balai Lepong, Sg. Mujong
RS4
Rh. Asun, Lepong, Sg. Mujong
Sg. Serangan
NAT15
Sg. Senyan
Sg. Selabi
Sg. Serau
Sg. Jambu
Sg. Anduh
W19
Rh. Sipang, Ng. Banyau
Sg. Sebulit
Sg. Sekali
Rh. Anting, Batu Bansu
A6/N6/EMF6
W18
Rh. Tang Spot, Ng. Banyau
Sg. Temawai
AP6
Sg. Senuang
Sg. Gimang
Sg. Semuntik
Sg. Sepakok
Sg. Sarabong
Rh. Ekau, Ng. Mujong
Sg. Meruken
Sg. Sebandau
Sg. Usun
Rh. Pinin Rh. Nyanggau
Sg. Pangin
Rh. Jimbun, Ulak Tapang
Sg. Sesawa
Sg. Tel


Sg. Menkala
Sg. Momalon
Sg. Batu
500M RADIUS
NAT10
NAT9
Sg. Enkalah
AT11
500M RADIUS
W21
Rh. John Ak Katil, Kerangan Ara
RS5
Rh. Sana, Ng. Staba
A8/N8/EMF8
BATANG BALEH
Rh. Sebuang, Ng. Merama
Rh. Saging, Ng. Merama
Sg. Seririk
SUNGAI GAAT
Sg. Ensurai
SUNGAI PULANG
Sg. Patingalan


Sg. Sebatu
Sg. Simpileh
AT7
NAT6
Rh. Jantai, Ng. Entelangau
Sg. Pasir
W22
AP3
Rh. Bully, Kerangan Besai
BATANG BALEH

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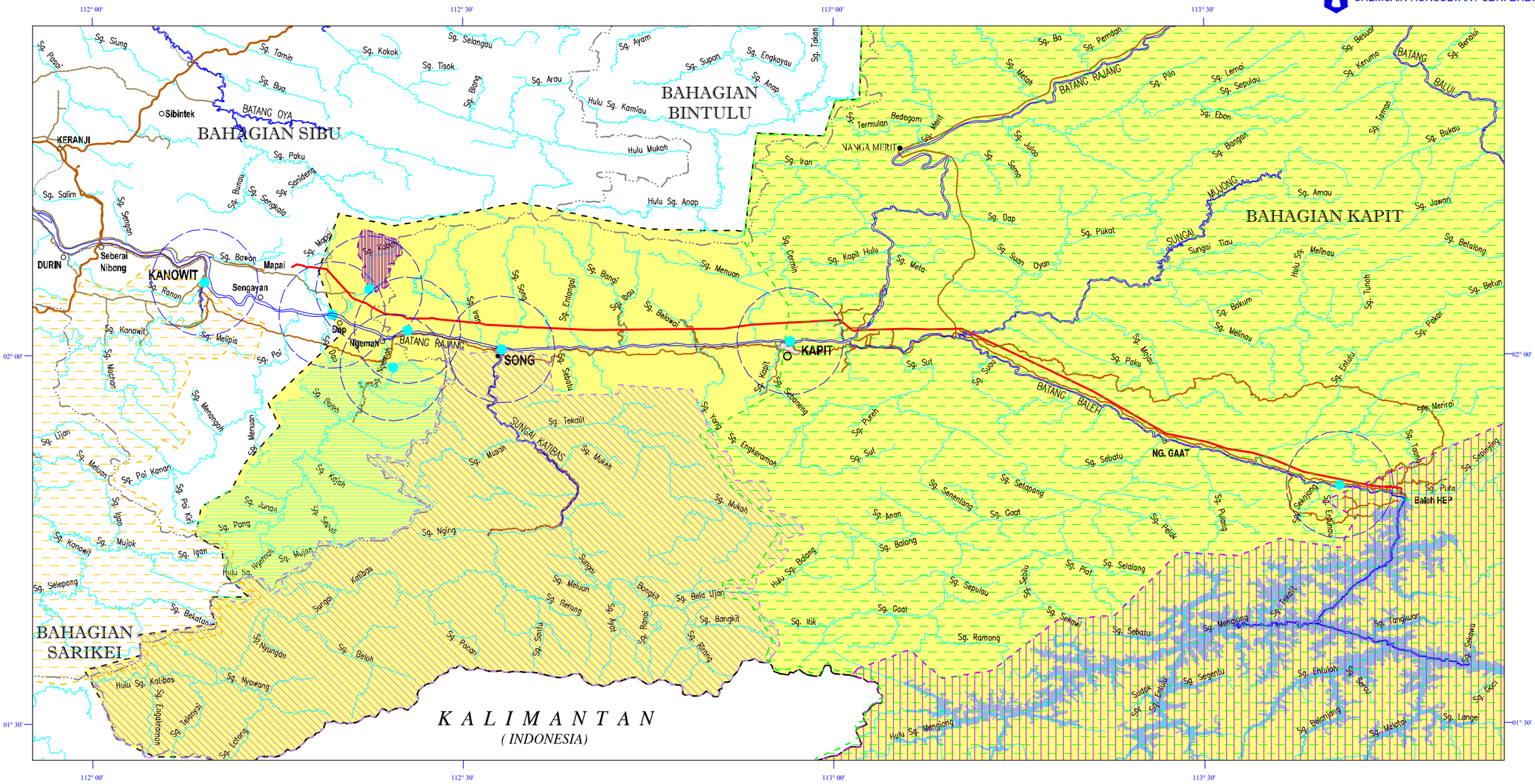

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE PROPOSED BALEH-MAPAI 500 KV TRANSMISSION LINE PROJECT

LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- INTERNATIONAL BOUNDARY
- DIVISIONAL BOUNDARY
- BALEH DAM
- BALEH DAM RESERVOIR
- RIVERS / STREAMS
- ROADS / MOTORABLE TRACK
- RAW WATER INTAKE POINTS
- NANGA DAP WATER CATCHMENT
- KAPIT WATER CATCHMENT
- SONG WATER CATCHMENT
- NANGA ENTAWAU WATER CATCHMENT
- NANGA TADA WATER CATCHMENT
- NANGA NGUNGUN WATER CATCHMENT
- KANOWIT WATER WATER CATCHMENT
- 8 Km. RADIUS FROM WATER INTAKE POINT

N

0 10 20 30 40Km

SCALE IN KILOMETRES (1:600,000) – A3 MEDIUM

SNID

-The outer ticks indicate the Latitude and Longitude

SOURCE: Adapted from JBALB

SERIES 8
EDITION 8
SCALE 1:500,000

RIVER SYSTEM AND CATCHMENT OF BATANG RAJANG

FIGURE: 5.8.1

D:\ACAD\DRAWINGS\EV103\792\FIG-5B1.DWG

5.8.4 Existing Sources of Water Pollution

There are numerous pollutants that enter the water bodies every day. Due to its location, the most common pollutants of Btg. Rajang, Btg. Baleh and their tributaries are suspended solids, agricultural, timber and human wastes.

Timber and plantation activities, coal mining, sand dredging activities (e.g., along Btg. Baleh) road constructions within the catchment and ongoing construction of the Baleh HEP located upstream of Btg. Baleh are some of the potential contributors to pollution of these water-ways. Sand dredging is not conducted in any of the tributaries mentioned above and the coal mining activities are located upstream of Btg. Rajang, away from the study area. Timber and plantation activities and road construction activities are common activities located along the tributaries. Tributaries located near these activities are likely to have higher suspended solids.

Direct discharges of raw sewage and grey water especially from longhouse settlements along the rivers and sewage leakage originated from nearby construction sites are likely to impact the river water quality as well. Therefore, elevated faecal coliform count in the river water is expected.

5.8.5 Riverine Water Quality

Baseline river water sampling was carried out from 20 Oct to 22 Oct 2020. Samples were collected from 15 locations (**Figure 5.8.2 (a) to (d**)) at selected tributaries of Btg. Rajang and Btg. Baleh and 10 locations at Btg. Rajang and Btg. Baleh itself. Samples from Btg. Rajang and Btg. Baleh will serve as reference points.

Out of the 15 samples from selected tributaries, four (4) samples were collected from gravity feed water supply (GFS) tap at longhouses near the tributaries which will represent water quality of their gravity feed water catchment areas. Metal content were also analysed for these GFS samples including three (3) points located near water intake points along Btg. Rajang and Btg. Baleh.

Table 5.8.2 summarises the parameters tested for all the sampling points while the description on water quality sampling points is shown in **Table 5.8.3**.

Table 5.8.2: List of Parameters Analysed for Each Sampling Points

No.	Parameters	Sampling Points
1.	Temperature, °C	All water sampling points (W1 to W25)
2.	pH Value	
3.	Dissolved Oxygen (DO), mg/L	
4.	Turbidity (NTU)	
5.	Biochemical Oxygen Demand (BOD) mg/L	
6.	Chemical Oxygen Demand (COD), mg/L	
7.	Total Suspended Solids (TSS), mg/L (TSS)	
8.	Total Dissolved Solids (TDS), mg/L (TDS)	
9.	Ammoniacal Nitrogen (as N), mg/L	
10.	Oil & Grease (O&G), mg/L	
11.	Total Coliform Count (TCC) MPN/100 mL	
12.	Faecal Coliform Count (FCC) MPN/100 mL	
13.	Lead (as Pb), mg/L	W1, W8, W9, W14, W21, W22 and W23
14.	Copper (as Cu), mg/L	
15.	Zinc (as Zn), mg/L	
16.	Nickel (as Ni), mg/L	
17.	Cadmium (as Cd), mg/L	
18.	Chromium, Hexavalent (as Cr^{6+}), mg/L	
19.	Chromium, Trivalent (as Cr^{3+}), mg/L	
20.	Iron (as Fe), mg/L	
21.	Manganese (as Mn), mg/L	
22.	Mercury (as Hg), mg/L	
23.	Silver (as Ag), mg/L	
24.	Tin (as Sn), mg/L	
25.	Selenium (as Se), mg/L	
26.	Arsenic (as As), mg/L	
27.	Aluminium (as Al), mg/L	
28.	Barium (as Ba), mg/L	

All samples were collected by means of grab sampling into sampling bottles. The samples were labelled according to their sampling station ID, preserved in ice and stored in cooler boxes as they were delivered to the laboratory for analysis.

All samples were analysed by Chemsain Konsultant Sdn Bhd (SAMM 057), which is an accredited laboratory under the Laboratory Accreditation Scheme of Malaysia (*Skim Akreditasi Makmal Malaysia*). Temperature, pH Value and DO were measured in-situ using the pH and DO Meter.

Plate 5.8.7: Example of river and GFS water sampling.

Plate 5.8.8: Example of in-situ DO, pH and temperature measurement.

The results were then compared against the National Water Quality Standard for Malaysia (NWQSM) (see **Appendix 5.8.2**) as shown in **Table 5.8.4** and **Table 5.8.5**. The analysis report is appended in **Appendix 5.8.3**.

According to NREB, it is the State Government's objective of maintaining water quality of rivers to at least Class IIB (for recreational use with body contact) of the NWQSM. Therefore, Class IIB of the NWQSM shall be used as a main water quality standard throughout this report. The Recommended Raw Water Quality Standard by the Ministry of Health, Malaysia (MOH) will also be listed as it sets out the maximum acceptance levels for raw water quality, which will be suitable as potable source after undergoing conventional treatment. For raw water with constituent's concentration below the recommended criteria, only conventional water treatment is necessary. In addition, Drinking Water Standard by World Health Organization (WHO) shall also be referred where relevant.

Table 5.8.3: Description on Water Sampling Points

ID	Coordinates	Weather	Description and Justification	
W1	02° 5'0.83"N 112°12'56.66"E	Fine	Midstream of Btg. Rajang, before Kanowit town and within 8 km radius of Kanowit water intake. Approximately 7.5 km downstream of proposed transmission line. The river width is approximately 300 m. Representing overall water quality downstream of the Project site before flowing further away from the study area.	
W2	02° 3'33.17"N 112°19'28.40"E	Fine	Downstream of Sg. Mapai, approximately 3.8 km downstream of proposed transmission line. The width of the river mouth is approximately 12 m. Representing water quality downstream of a major tributary crossed by the proposed transmission line with various settlements and sensitive receptors located along this tributary.	

ID	Coordinates	Weather	Description and Justification	
W3	02° 9'18.90"N 112°17'0.35"E	Fine	Upstream of Sg. Mapai, approximately 3.5 km upstream of proposed transmission line. The river width is approximately 6 m. Representing water quality upstream of the tributary and the proposed transmission line crossing before flowing to various settlements and sensitive receptors located along this tributary.	
W4	02° 3'12.55"N 112°20'31.49"E	Fine	Downstream of Sg. Kabah, approximately 3.3 km downstream of proposed transmission line. The width of river mouth is approximately 25 m. Representing water quality downstream of a major tributary crossed by the proposed transmission line with various settlements and sensitive receptors located along this tributary.	

ID	Coordinates	Weather	Description and Justification	
W5	02° 1'8.95"N 112°31'36.31"E	Fine	Downstream of Sg. Iran, approximately 2.5 km downstream of proposed transmission line. The width of river mouth is approximately 25 m. Representing water quality downstream of a major tributary crossed by the proposed transmission line with various settlements and sensitive receptors located along this tributary.	
W6	02° 0'51.29"N 112°32'30.29"E	Fine	Midstream of Btg. Rajang, after Song town and approximately 2.9 km downstream from proposed transmission line. The river width is approximately 310 m. Representing water quality midstream of Btg. Rajang with potential pollution discharge from various sources located upstream.	

ID	Coordinates	Weather	Description and Justification	
W7	02° 0'49.31"N 112°33'4.33"E	Fine	Downstream of Sg. Song, approximately 2.8 km downstream of proposed transmission line. The width of river mouth is approximately 30 m. Representing water quality downstream of a major tributary crossed by the proposed transmission line with various settlements and sensitive receptors located along this tributary.	
W8	02° 0'38.39"N 112°35'38.93"E	Fine	Water samples from Rh. Nyala Ak Pang located approximately 3 km downstream of proposed transmission line. Representing GFS catchment in the area. GFS intake located upstream of Sg. Manap. Representing the water quality of GFS catchment in the area.	

ID	Coordinates	Weather	Description and Justification	
W9	02° 0'45.88"N 112°41'59.87"E	Fine	Water samples from Rh. Tat, Nanga Entagai located approximately 2.3 km downstream of proposed transmission line. Representing GFS catchment in the area. GFS intake located upstream of Sg. Entangai. Representing the water quality of GFS catchment in the area.	
W10	02° 0'42.86"N 112°43'5.55"E	Fine	Downstream of Sg. Ibau, approximately 2.4 km downstream of proposed transmission line. The width of river mouth is approximately 35 m. Representing water quality downstream of a major tributary crossed by the proposed transmission line with various settlements and sensitive receptors located along this tributary.	

ID	Coordinates	Weather	Description and Justification	
W11	02° 00' 42.83"N 112° 44' 42.38"E	Fine	Midstream of Btg. Rajang, before Song town and approximately 2.4 km downstream of proposed transmission line. The river width is approximately 250 m. Representing water quality midstream of Btg. Rajang with existing pollution discharge from various sources located upstream.	
W12	02° 0'55.40"N 112°49'1.14"E	Fine	Downstream of Sg. Belawai, approximately 2.1 km downstream of proposed transmission line. The width of river mouth is approximately 20 m. Representing water quality downstream of a major tributary crossed by the proposed transmission line with various settlements and sensitive receptors located along this tributary.	

ID	Coordinates	Weather	Description and Justification	
W13	02° 1'11.11"N 112°54'5.79"E	Fine	Downstream of Sg. Menuan, approximately 2.3 km downstream of proposed transmission line. The width of river mouth is approximately 30 m. Representing water quality downstream of a major tributary crossed by the proposed transmission line with various settlements and sensitive receptors located along this tributary.	
W14	02° 1'4.04"N 112°57'9.86"E	Fine	Midstream of Btg. Rajang, near Kapit Water Intake point. Approximately 2.8 km downstream of proposed transmission line. The river width is approximately 260 m. Representing water quality midstream of Btg. Rajang and near the Kapit Water Intake.	

ID	Coordinates	Weather	Description and Justification	
W15	02° 1'9.37"N 112°59'29.52"E	Fine	Unnamed river, approximately 2.8 km downstream of proposed transmission line. The width of river mouth is approximately 5 m. Representing water quality downstream of a tributary with various settlements and sensitive receptors located upstream of this tributary.	
W16	02° 1'55.25"N 113° 2'7.94"E	Fine	Upstream of Btg. Rajang, before Btg. Baleh, approximately 50 m downstream of proposed transmission line. The river width is approximately 270 m. Representing water quality upstream of Btg. Rajang before converging with Btg. Baleh.	

ID	Coordinates	Weather	Description and Justification	
W17	02° 0'36.84"N 113° 3'32.24"E	Fine	Downstream of Btg. Baleh before flowing into Btg. Rajang, approximately 2.5 km downstream of proposed transmission line. The river width is approximately 170 m. Representing water quality downstream of Btg. Baleh with existing pollution discharge from various sources located upstream before converging with Btg. Rajang.	
W18	02° 1'26.99"N 113° 9'51.88"E	Fine	Midstream of Btg. Baleh, approximately 1.3 km downstream of proposed transmission line. The river width is approximately 190 m. Representing water quality midstream of Btg. Baleh with existing pollution discharge from various sources located upstream.	

ID	Coordinates	Weather	Description and Justification	
W19	02° 1'33.42"N 113°10'25.35"E	Fine	Downstream of Sg. Mujong, approximately 1.0 km downstream of proposed transmission line. The river width is approximately 70 m. Representing water quality downstream of a major tributary crossed by the proposed transmission line with various settlements and sensitive receptors located along this tributary.	
W20	01°56'30.07"N 113°20'41.89"E	Fine	Upstream of Btg. Baleh, before Sg. Mujong, approximately 1.1 km downstream of proposed transmission line. The river width is approximately 180 m. Representing water quality midstream of Btg. Baleh with existing pollution discharge from various sources located upstream.	

ID	Coordinates	Weather	Description and Justification	
W21	01°53'36.10"N 113°26'12.02"E	Fine	Rh. John Ak Katil located approximately 700 m downstream of proposed transmission line. Representing GFS catchment in the area. Representing the water quality of GFS catchment in the area.	
W22	01°51'22.87"N 113°33'32.18"E	Fine	Water sample from Rh. Bully Ak Janggu located approximately 1.2 km downstream of proposed transmission line. Representing GFS catchment in the area. Representing the water quality of GFS catchment in the area.	

ID	Coordinates	Weather	Description and Justification	
W23	01°49'19.71"N 113°41'6.95"E	Fine	Midstream of Btg. Baleh, near Entawau Water Intake point. Approximately 800 m downstream of proposed transmission line. The river width is approximately 110 m. Representing water quality midstream of Btg. Rajang and near the Entawau Water Intake.	
W24	01°48'50.36"N 113°45'6.88"E	Fine	Downstream of Sg. Putai, approximately 530 m downstream of proposed transmission line. The width of river mouth is approximately 50 m. Representing water quality downstream of a major tributary crossed by the proposed transmission line which may be affected by existing construction related to Baleh Dam and construction of the TL.	

ID	Coordinates	Weather	Description and Justification	
W25	01°48'30.70"N 113°45'34.92"E	Fine	Upstream of Btg. Baleh, approximately 1.1 km downstream of proposed transmission line and Baleh Dam. The river width is approximately 90 m. Representing water quality of upstream Btg. Baleh, immediate downstream of Baleh Dam and shows the effect on water quality from Baleh Dam construction.	

Note: Shaded rows to show they are main rivers of Btg. Rajang and Btg. Baleh (10 points)

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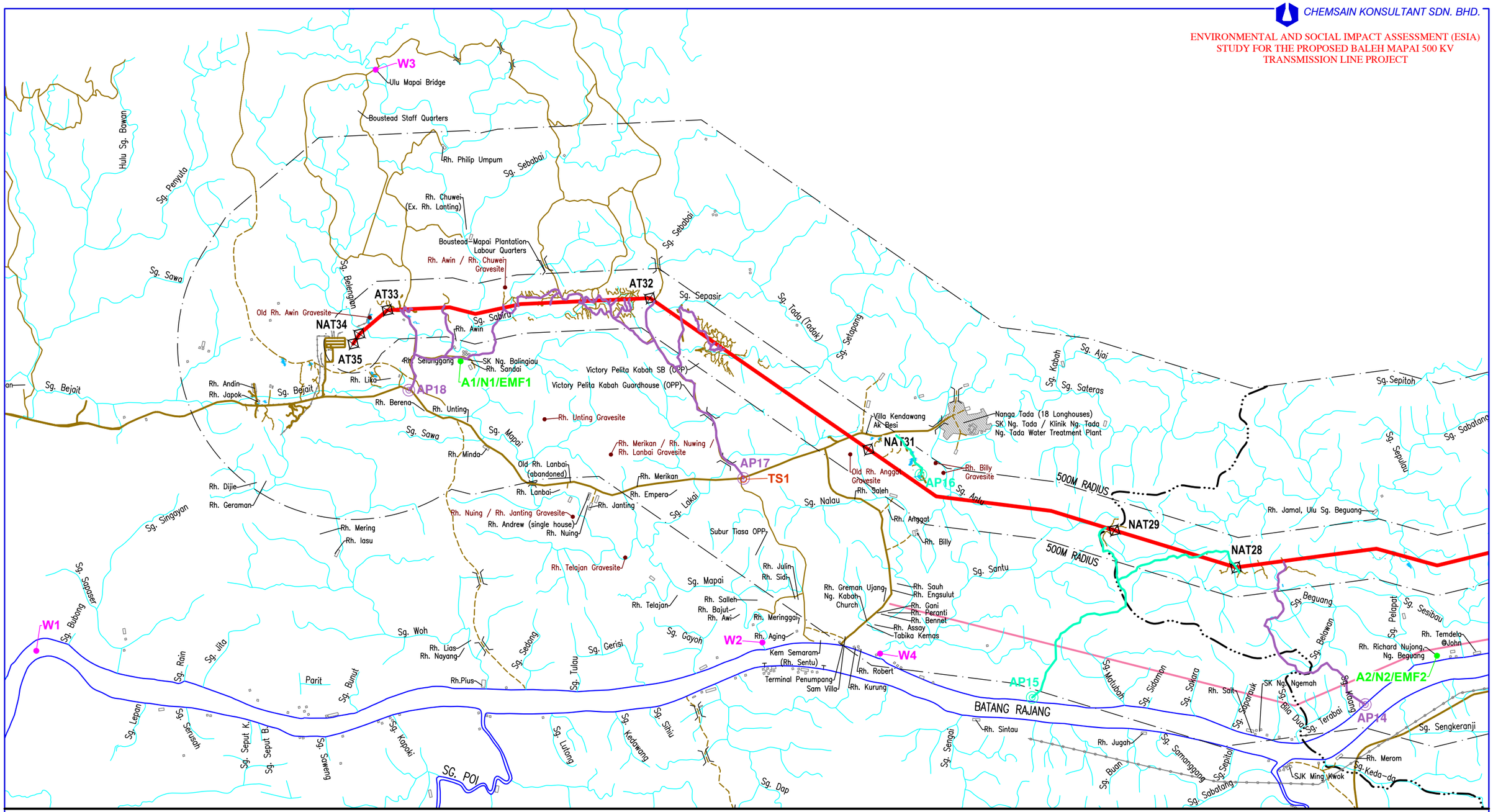
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
STUDY FOR THE PROPOSED BALEH MAPAI 500 KV
TRANSMISSION LINE PROJECT



LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- DIVISIONAL BOUNDARY
- EXISTING TRANSMISSION LINE
- BRIDGE
- ACCESS ROADS (OPERATING LOGGING / PLANTATION ROAD)
- ACCESS ROADS (COMMUNITY ACCESS ROAD / ABANDONED LOGGING TRACK)
- FUTURE ROADS
- ROAD TRAFFIC SURVEY - (TS1-TS5)
- RIVER TRAFFIC SURVEY - (RS1-RS5)
- BASELINE WATER SAMPLING LOCATIONS - (W1-W25)
- BASELINE AIR SAMPLING LOCATIONS - (A1-A10)
- BASELINE NOISE MONITORING LOCATIONS - (N1-N10)
- ELECTRO MAGNETIC FIELD MONITORING LOCATIONS - (EMF1-EMF10)

0 1 2 3 4Km

SCALE IN KILOMETRES (1:65,000) – A3 MEDIUM

SOURCE : Adapted from

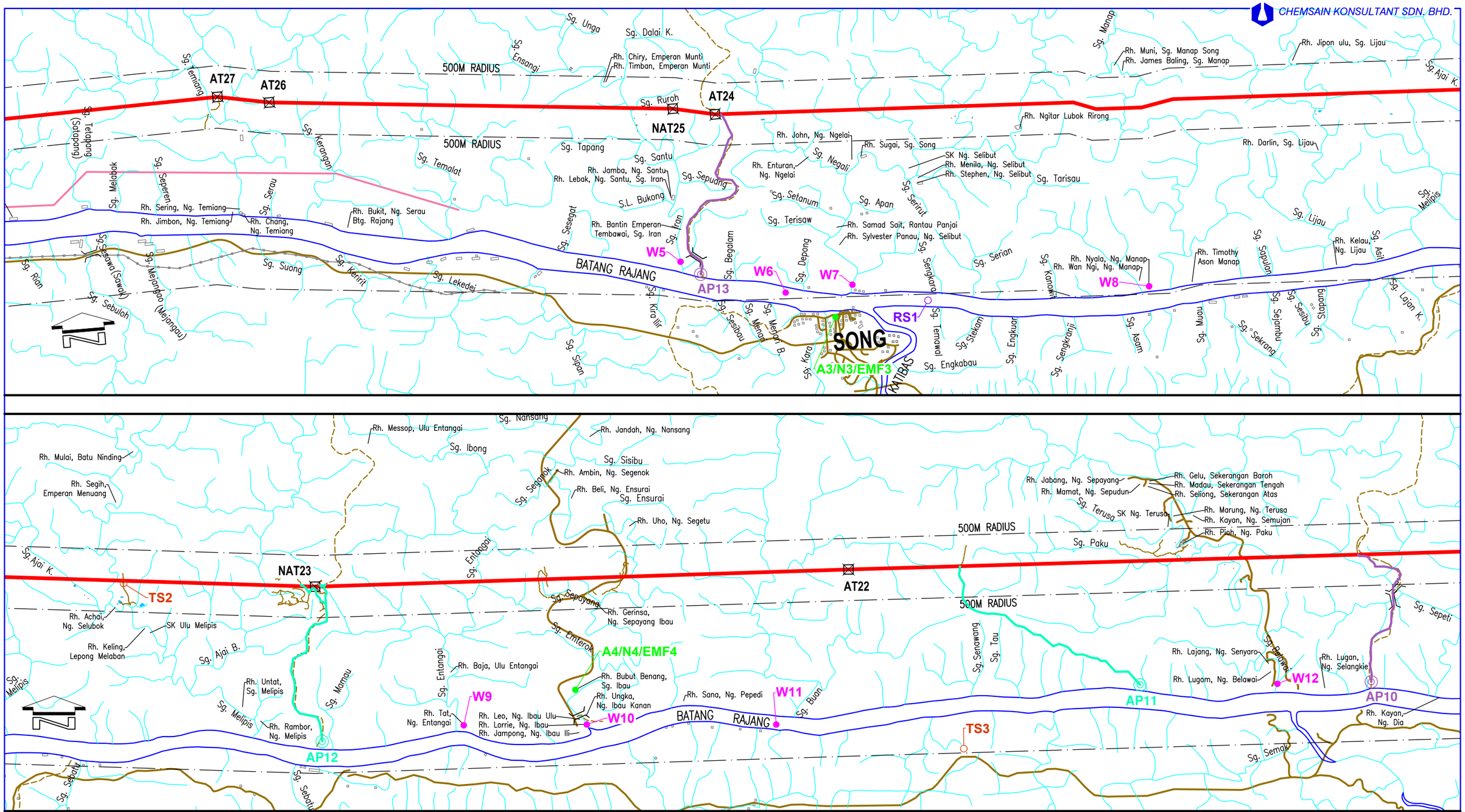
SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

ENVIRONMENTAL BASELINE SAMPLING LOCATIONS

FIGURE: 5.8.2a

D:\ACAD\DRAWINGS\EV103\792\FIG-582a_582d.DWG



LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- EXISTING TRANSMISSION LINE
- BRIDGE
- ACCESS ROADS (OPERATING LOGGING / PLANTATION ROAD)
- ACCESS ROADS (COMMUNITY ACCESS ROAD / ABANDONED LOGGING TRACK)
- FUTURE ROADS
- ROAD TRAFFIC SURVEY - (TS1-TS5)
- RIVER TRAFFIC SURVEY - (RS1-RS5)
- BASELINE WATER SAMPLING LOCATIONS - (W1-W25)
- BASELINE AIR SAMPLING LOCATIONS - (A1-A10)
- BASELINE NOISE MONITORING LOCATIONS - (N1-N10)
- ELECTRO MAGNETIC FIELD MONITORING LOCATIONS - (EMF1-EMF10)

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE PROPOSED BALEH MAPAI 500 KV TRANSMISSION LINE PROJECT

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE : Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

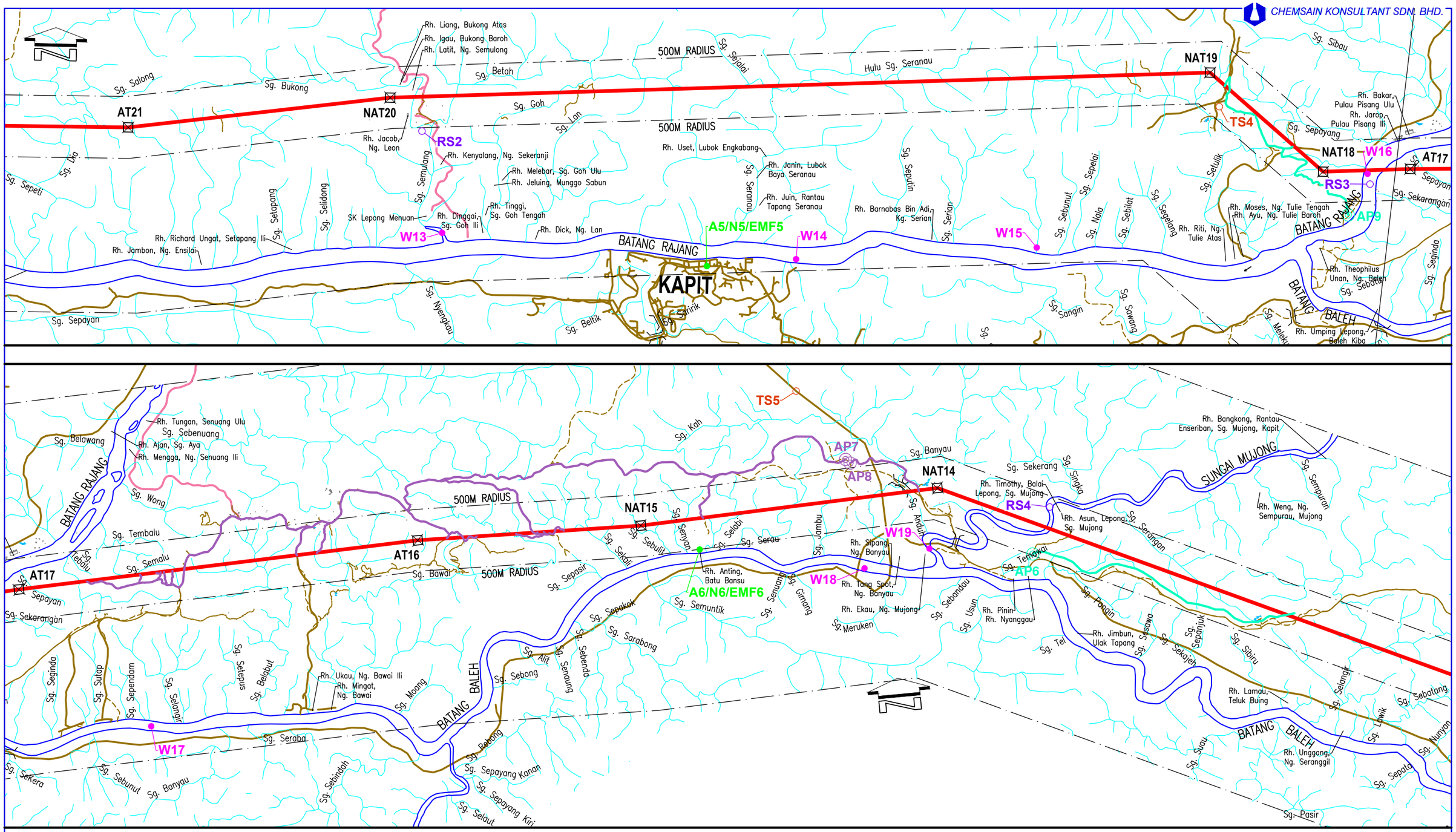
GRID
–The inner crosses indicate the Latitude and Longitude

ENVIRONMENTAL BASELINE SAMPLING LOCATIONS

FIGURE: 5.8.2b

D:\ACAD\DRAWINGS\EV103\792\FIG-582a_582d.DWG

CHEMSAIN KONSULTANT SDN. BHD.



LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- BRIDGE
- ACCESS ROADS (OPERATING LOGGING / PLANTATION ROAD)
- ACCESS ROADS (COMMUNITY ACCESS ROAD / ABANDONED LOGGING TRACK)
- FUTURE ROADS
- ROAD TRAFFIC SURVEY - (TS1-TS5)
- RIVER TRAFFIC SURVEY - (RS1-RS5)
- BASELINE WATER SAMPLING LOCATIONS - (W1-W25)
- BASELINE AIR SAMPLING LOCATIONS - (A1-A10)
- BASELINE NOISE MONITORING LOCATIONS - (N1-N10)
- ELECTRO MAGNETIC FIELD MONITORING LOCATIONS - (EMF1-EMF10)

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE PROPOSED BALEH MAPAI 500 KV TRANSMISSION LINE PROJECT

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

SOURCE: Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

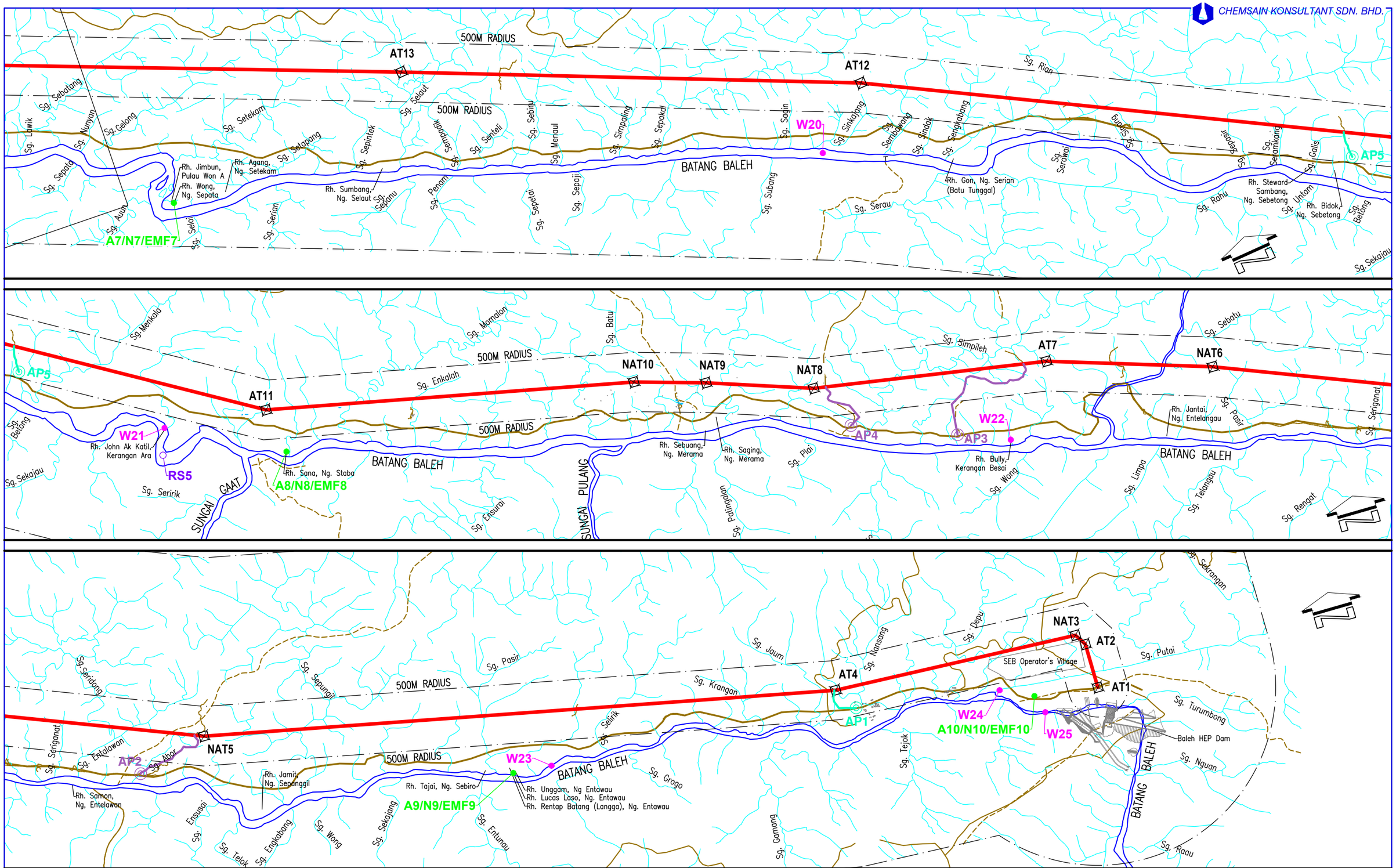
GRID
–The inner crosses indicate the Latitude and Longitude

ENVIRONMENTAL BASELINE SAMPLING LOCATIONS

FIGURE: 5.8.2c

D:\ACAD\DRAWINGS\EV103\792\FIG-582a_582d.DWG

CHEMSAIN KONSULTANT SDN. BHD.



LEGEND:

- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED ANGLE TOWER (AT1 - AT35)
- RIVERS
- ROADS
- BRIDGE
- ACCESS ROADS (OPERATING LOGGING / PLANTATION ROAD)
- ACCESS ROADS (COMMUNITY ACCESS ROAD / ABANDONED LOGGING TRACK)
- FUTURE ROADS
- ROAD TRAFFIC SURVEY - (TS1-TS5)
- RIVER TRAFFIC SURVEY - (RS1-RS5)
- BASELINE WATER SAMPLING LOCATIONS - (W1-W25)
- BASELINE AIR SAMPLING LOCATIONS - (A1-A10)
- BASELINE NOISE MONITORING LOCATIONS - (N1-N10)
- ELECTRO MAGNETIC FIELD MONITORING LOCATIONS - (EMF1-EMF10)

SOURCE : Adapted from

SERIES T738 SHEET 5914 EDITION 1-PPNM	SERIES T738 SHEET 6014 EDITION 1-PPNM	SERIES T738 SHEET 6114 EDITION 1-PPNM	SERIES T738 SHEET 6214 EDITION 1-PPNM
SERIES T738 SHEET 6314 EDITION 1-PPNM	SERIES T738 SHEET 6413 EDITION 1-PPNM	SERIES T738 SHEET 6414 EDITION 1-PPNM	SERIES T738 SHEET 6513 EDITION 1-PPNM

GRID
–The inner crosses indicate the Latitude and Longitude

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE PROPOSED BALEH MAPAI 500 KV TRANSMISSION LINE PROJECT

0 1 2 3 4Km

SCALE IN KILOMETRES (1:60,000) – A3 MEDIUM

ENVIRONMENTAL BASELINE SAMPLING LOCATIONS

FIGURE: 5.8.2d

D:\ACAD\DRAWINGS\EV103\792\FIG-582a_582d.DWG

Table 5.8.4: Laboratory Analysis Results of Baseline Water Samples

Parameters	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	W21	W22	W23	W24	W25	Class IIB	MOH	WHO/IFC*
Temperature, °C	27.4	27.4	25.8	26.7	27.1	28.1	27.8	29.5	29.2	29.0	28.4	28.6	28.2	28.3	28.5	28.4	27.4	27.5	28.6	28.3	30.6	29.4	26.9	26.4	26.6	-	-	-
pH Value	7.0	6.8	**5.8**	6.6	6.8	6.6	6.7	7.2	7.1	6.7	6.8	6.7	6.9	6.9	6.5	6.6	7.0	7.2	7.2	7.0	6.8	7.1	7.0	6.9	6.7	6.0 – 9.0	5.5 – 9.0	6.0 – 9.0*
Dissolved Oxygen, mg/L	5.8	5.7	6.1	5.7	5.7	5.6	6.2	5.1	5.7	5.6	5.3	6.1	5.8	5.3	5.2	5.4	6.5	6.6	6.4	6.4	**4.8**	**4.9**	6.9	6.8	**7.4**	5 – 7	-	-
Turbidity (NTU)	**60**	**70**	**120**	**65**	40	**110**	**120**	1.6	0.80	**70**	**60**	40	**120**	**120**	37	38	**150**	**110**	6.3	49	1.5	0.70	11	2.9	8.5	50	1000	-
Biochemical Oxygen Demand, mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<l.0	<l.0	<l.0	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3	6	30*
Chemical Oxygen Demand, mg/L	18	13	**26**	21	15	15	12	11	11	20	11	16	23	**31**	25	**27**	18	20	**28**	22	15	23	13	17	12	25	10	125*
Total Suspended Solids, mg/L	**50.8**	**63.6**	**62.6**	**54.0**	33.8	**93.7**	**114**	<5.0	<5.0	41.6	40.6	37.2	**100**	**103**	32.2	33.8	**120**	**98.2**	5.4	38.8	<5.0	<5.0	9.4	<5.0	6.6	50	-	50*
Total Dissolved Solids, mg/L	44.0	32.0	32.0	50.0	32.0	40.0	45.0	67.0	48.0	31.0	28.0	88.0	50.0	45.0	41.0	28.0	44.0	45.0	47.0	37.0	35.0	41.0	36.0	33.0	37.0	-	-	-
Ammoniacal Nitrogen (as N), mg/L	0.08	0.05	0.09	0.08	0.17	0.07	0.08	<0.05	<0.05	0.10	0.09	0.10	0.08	<0.05	0.13	0.13	0.13	0.13	0.11	0.12	0.11	0.13	<0.05	0.16	0.14	0.3	1.5	10*
Oil & Grease, mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	N	-	10*
Total Coliform Count MPN/100 mL	1100	460	2800	3500	**5400**	792	3500	490	790	2400	1300	3500	**9200**	490	330	490	790	**9200**	**5400**	2200	2400	3500	1300	1300	490	5000	5000	Not present
Faecal Coliform Count MPN/100 mL	**780**	330	**1300**	**1300**	**2400**	**490**	**2400**	**2300**	**790**	**2400**	**1300**	**2400**	**2400**	230	230	230	230	**2400**	**2400**	**790**	**2400**	**2400**	**1300**	230	330	400	5000	Not present

Note: Shaded figures exceeded the NWQSM guideline values (Class IIB)

**No health-based guideline value is recommended according to WHO Guideline for Drinking-water Quality (4th Ed 1st Add. 2017) – Values are obtained from IFC's Environmental, Health, and Safety (EHS) Guideline, Indicative Values for Treated Sanitary Sewage Discharges*

N = Free from visible film sheen, discolouration and deposits

Table 5.8.5: Laboratory Analysis Results of Metals in Baseline Water Samples

Parameters	W1	W8	W9	W14	W21	W22	W23	Class IIB	MOH	WHO
Lead (as Pb), mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	0.05	0.01
Copper (as Cu), mg/L	<0.02	<0.02	<0.02	**0.26**	<0.02	<0.02	<0.02	0.02	1.0	2.0
Zinc (as Zn), mg/L	0.03	0.03	0.18	0.04	0.02	<0.02	0.02	5.0	3.0	-
Nickel (as Ni), mg/L	<0.02	<0.02	<0.02	**0.48**	<0.02	<0.02	<0.02	0.05	-	0.07
Cadmium (as Cd), mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.01	0.003	0.003
Chromium, Hexavalent (as Cr^{6+}), mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	-**	-**
Chromium, Trivalent (as Cr^{3+}), mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-**	-**
Iron (as Fe), mg/L	**3.02**	0.22	0.70	**4.45**	0.16	0.07	**1.28**	1.0	1.0	-
Manganese (as Mn), mg/L	0.04	<0.02	<0.02	0.08	<0.02	<0.02	<0.02	0.1	0.2	0.4
Mercury (as Hg), mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.006
Silver (as Ag), mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	-	-
Tin (as Sn), mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	-	-	-
Selenium (as Se), mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.01	0.01	0.01
Arsenic (as As), mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.05	0.01	0.01
Aluminium (as Al), mg/L	2.30	0.15	0.11	2.89	0.16	0.06	0.85	-	-	-
Barium (as Ba), mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.0	-	0.07

Note: Shaded figures exceeded the NWQSM guideline values (Class IIB)

***Guideline value for total chromium (0.05 mg/L)*

5.8.5.1 Physical Parameters

Temperature

Water temperature was measured in-situ for all sampling locations and results show normal values ranging from 25.6 to 30.6.

pH Value

pH is a value representing the acidity or alkalinity of a solution and is defined as the negative logarithm of the hydrogen ion concentration, pH = -log10[H+].

The pH level of water body often affects the distribution and the survival of aquatic organisms. The pH values at all sampling points are well within the Class IIB compliance range of 6 – 9 except for W3 which recorded pH at 5.8. The slightly acidic level recorded at W3 was likely from the by-product of decomposing organic materials within the oil palm plantation. However, pH at W3 is still considered within the MOH's recommended range (5.5 – 9.0) for raw water quality. According to WHO standards, pH is not of health concern at levels found in drinking water while the guideline value for pH according to IFC's EHS Guideline for Treated Sanitary Sewage Discharges is also in the range of 6 – 9.

Turbidity

Turbidity is a measure of the light's ability pass through water, or the water's cloudiness. The cloudiness is caused by presence of suspended solids (generally soil particles) and also plankton. Thus, there is a good agreement between the levels of turbidity and the measures of total suspended solids in the corresponding water samples since turbidity is itself is a measure of the amount of suspended solids in water. The relationship between the two is proportional, one increases with another. Suspended particles absorb heat from sunlight causing turbid water to become warmer and therefore reducing the concentration of oxygen in the water.

Turbidity across all samples ranged from 0.8 NTU to 150 NTU. Generally, turbidity of water samples collected from Btg. Rajang and its tributaries have high turbidity which exceeds the Class IIB Standard. Surface runoff from anthropogenic activities which involves clearing and soil disturbance located upstream may have contributed to the high turbidity recorded. Most samples collected from Btg. Baleh and its tributaries (W19 to W25) showed compliance with Class IIB of the NWQSM. However, the turbidity of all water samples still complies with the MOH's recommended range for turbidity (1000 NTU).

Total Suspended Solids (TSS)

Total suspended solids (TSS) is used as an indicator of the amount of sediments in the water. The source of sediments can be from natural erosion of riverbank and channel, soil erosion from disturbed area and inflow of effluents from development area such as construction site.

Similar to turbidity, the TSS recorded was generally higher along Btg. Rajang and its tributaries compared to samples collected along Btg. Baleh and its tributaries. Out of the 16 water samples collected (W1 to W16) along Btg. Rajang and its tributaries, 10 samples show non-compliance to Class IIB of the NWQSM and the IFC's EHS Guideline for Treated Sanitary Sewage Discharges while samples from Btg. Baleh and its tributaries (W17 to W25) showed compliance except for W17 and W18. Run-off from the anthropogenic activities (timber and plantation activities) on the upstream part of the rivers may contribute to the recorded TSS level.

Total Dissolved Solids (TDS)

TDS is a measure of the total concentration of dissolved substances in water. It is made up of inorganic salts and small amount of organic matter. TDS of the water samples ranges from 28 mg/L to 88 mg/L. According to WHO standards, no health-based guideline value for TDS has been proposed for drinking water.

Oil and Grease

The oil and grease levels of all water samples were <1.0 mg/L and all samples were free of invisible sheen, discolouration and deposits. The oil and grease levels recorded are acceptable based on the IFC's EHS Guideline for Treated Sanitary Sewage Discharges (10 mg/L).

5.8.5.2 Chemical Parameters

Chemical Oxygen Demand (COD)

The COD is a measure of the oxygen equivalent of the organic matter in a water sample which is subject to oxidation by strong chemical oxidant. The COD is commonly used as measure of the susceptibility to oxidation of the organic and inorganic materials present in water bodies and industrial well as sewage effluents (Chapman, 1996).

All water samples reported COD well within the Class IIB limit except for W3, W16 and W19. The high oxygen demand for chemical breakdown process can be attributed to the presence of organic matter such as detritus in the water from upstream sources. All samples analysed however have exceeded the MOH's recommended COD level (10 mg/L) but are still acceptable based on IFC's EHS Guideline for Treated Sanitary Sewage Discharges (COD 125 mg/L).

Biochemical Oxygen Demand (BOD)

The BOD is an approximate measure of the biochemically degradable organic matter present in a water sample. This is determined by the amount of oxygen required for aerobic microorganisms to oxidise the organic matter to a stable organic form in the sample (Chapman, 1996).

All samples collected reported BOD of <1.0 mg/L to 1.4 mg/L which are still within Class IIB limit 3.0 mg/L of the NWQSM and MOH's stipulated limit of 6 mg/L. Similarly, all samples complied with the IFC's EHS Guideline for Treated Sanitary Sewage Discharges (BOD 30 mg/L). BOD measurements are typically lower than COD measurements which can be observed in the baseline results.

Dissolved Oxygen (DO)

DO is the amount of oxygen that is present in water. Water bodies receive oxygen from aquatic plants and the atmosphere or mixed in quickly through aeration. The main factor causing dissolved oxygen levels to change in a negative way is the build-up organic wastes (e.g., leaves, dead plants and animals, and sewage) that are broken down by bacteria, which consumes oxygen.

It is an important parameter in assessing water quality because of its influence on the organisms living within a body of water. A DO level that is too high or too low can harm aquatic live and affect water quality. All water samples reported DO level within the Class IIB range except for W21, W22, W25. Low DO level reported may have been contributed by the organic waste flowing into the river from various sources located upstream. As for the high DO level at W25, the fast-flowing river water may have increased aeration which contributed to the higher DO level recorded.

Ammoniacal Nitrogen

Ammoniacal nitrogen is a measure for the amount of ammonia to determine pollution by sewage, liquid manure and other liquid organic products. It is a natural

product of decay organic nitrogen compounds and one of the many contaminants in water supply. Ammonical nitrogen reported for all water samples were within the Class IIB limit of 0.3 mg/L. According to WHO, no health-based guideline value has been proposed as it occurs in drinking-water at concentration well below of those health concern. All samples are within the guideline value for total nitrogen according to IFC's EHS Guideline for Treated Sanitary Sewage Discharges (10 mg/L).

5.8.5.3 Microbiological Parameters

Total Coliform Count (TCC) and Faecal Coliform Count (FCC)

Total coliform is rod-shaped gram-negative non-spore forming bacteria and are largely found in soil, vegetation and aquatic environment. The total coliform group includes faecal coliform bacteria such as *Escherichia coli* which is commonly found in the lower intestine of warm-blooded animals. The presence of E. coli occurrence in the environment indicates the likely presence of human generated wastes or animal droppings. Hence, faecal coliform count is conducted to determine whether the water is contaminated by waste water and excrement, and also warm-blooded animal droppings.

The TCC for all water samples showed compliance with the Class IIB limit of 5.0 x 10^3 MPN/100 mL except for samples collected from W5, W13, W18 and W19 with TCC reported ranging from 5.4 x 10^3 to 9.2 x 10^3 MPN/100 mL. On the contrary, all samples have exceeded the guideline value for total coliform bacteria (400 MPN/100 mL) based on the IFC's EHS Guideline for Treated Sanitary Sewage Discharges.

For FCC, only samples from W2, W14, W15, W16, W17, W24 and W25 complied with the Class IIB limit of 4.0 x 10^2 MPN/100 mL. FCC non-compliance might have been linked to animal droppings and untreated sewage discharged upstream of the sampling points. These samples however, are still within the MOH's acceptable value for *E. coli* in raw water (5.0 x 10^3 MPN/100 mL).

According to WHO in the Guidelines for Drinking-Water Quality (2008), faecal indicator bacteria such as *E. coli*, are important parameters for verification of microbial quality and water intended for human consumption should contain no indicator organisms.

5.8.5.4 Metals

Metals were analysed for selected points which are located within 8 km radius of water intake points and water samples taken from gravity feeds utilized by the locals living along the study area. Metals analysed include lead, copper, zinc, nickel, cadmium, chromium hexavalent, chromium trivalent, iron, manganese, mercury, silver, tin, selenium, arsenic, aluminium and barium.

Except for copper, nickel and iron, all other metals analysed were well below the stipulated Class IIB limit of NWQSM.

- **Copper (Cu)** – The Cu concentration for all water samples analysed were below the Class IIB limit of 0.02 mg/L except for W14 which reported Cu concentration of 0.26 mg/L. Various sources of Cu present in surface water can be attributed either to natural (e.g., geological deposits, weathering and erosion of rocks and soils) or anthropogenic sources near urban centres and settlements along the river. Cu concentration at W14 also exceeded the recommended limit set by MOH and WHO.

- **Nickel (Ni)** – The Ni concentration for all water samples analysed were below the Class IIB limit of 0.05 mg/L except for W14 which reported Ni concentration of 0.48 mg/L. Potential sources of Ni in surface water may result from both natural and anthropogenic sources near urban centres and settlements along the upstream river. There is no guideline limit set by MOH for Ni concentration. Ni concentration at W14 concentration still exceeded the stipulated limit for drinking water set by WHO (0.07 mg/L).

- **Iron (Fe)** – The Fe concentration for all water samples analysed were below the Class IIB limit of 1.0 mg/L except for W1, W14 and W23. Fe concentration reported at W14 being the highest (4.45 mg/L) followed by W1 (3.02 mg/L) and W23 (1.28 mg/L). Similarly, the acceptable limit set by MOH is 1.0 mg/L for Fe concentration. Natural and anthropogenic sources of Fe may both be associated with human activity nearby urban and agricultural centres and settlements upstream.

Overall, Cu, Ni and Fe reported highest at W14. Anthropogenic activities from the nearby urban centre (Kapit Town) and settlements along the river may contribute to the slightly elevated metal levels in river water.

5.8.6 General Water Quality

The Water Quality Index (WQI) shows that all the water samples collected falls under the category of "Clean" except for W14 which is slightly polluted (refer **Table 5.8.6**). Anthropogenic activities from the nearby Kapit town and settlements along the upstream river may have contributed to the slightly polluted WQI.

The WQI (see **Table 5.8.7** and **Table 5.8.8**) relates a group of water quality parameters to a common scale and combines them into a single number in accordance with a chosen method or model of computation. The main purpose of the WQI system is to use it as a means of preliminary assessment for a water body for compliance with the standards adopted for five designated classes of beneficial uses.

The parameters selected for the WQI based on the formula by the DOE involves DO, BOD, COD, SS, AN and pH. However, parameters such as FCC, which is also an important determinant of water quality are not taken into account in the WQI calculation. The formula used in the calculation of the DOE's WQI:

WQI = 0.22*SIDO + 0.19*SIBOD + 0.16*SICOD + 0.15*SIAN + 0.16*SISS + 0.12*SIpH

Where,

SI - Subindex of each parameter

DO - Dissolve Oxygen

BOD - Biological Oxygen Demand

COD - Chemical Oxygen Demand

AN - Ammoniacal Nitrogen

SS - Suspended Solid

pH - Acidity/Alkalinity

Table 5.8.6: Water Quality Index of Baseline Water Samples

Sampling ID	WQI	Class	WQ Status
W1	86	II	C
W2	86	II	C
W3	82	II	C
W4	84	II	C
W5	86	II	C
W6	83	II	C
W7	86	II	C
W8	89	II	C
W9	91	II	C
W10	85	II	C
W11	86	II	C
W12	88	II	C
W13	82	II	C
W14	80	II	SP
W15	83	II	C
W16	83	II	C
W17	84	II	C
W18	84	II	C
W19	89	II	C
W20	87	II	C
W21	87	II	C
W22	85	II	C
W23	93	I	C
W24	91	II	C
W25	93	I	C

SP = Slightly Polluted, C = Clean

Table 5.8.7: Water Quality Classification Based on Water Quality Index

SUB INDEX & WATER QUALITY INDEX	INDEX RANGE		
	CLEAN	SLIGHTLY POLLUTED	POLLUTED
Biochemical Oxygen Demand (BOD)	91 - 100	80 - 90	0 - 79
Ammoniacal Nitrogen (NH_3-N)	92 - 100	71 - 91	0 - 70
Suspended Solids (SS)	76 - 100	70 - 75	0 - 69
Water Quality Index (WQI)	81 - 100	60 - 80	0 - 59

Table 5.8.8: Water Quality Index Classification

PARAMETER	UNIT	CLASS				
		I	II	III	IV	V
Ammoniacal Nitrogen	mg/l	< 0.1	0.1 – 0.3	0.3 – 0.9	0.9 – 2.7	> 2.7
Biochemical Oxygen Demand	mg/l	< 1	1 – 3	3 – 6	6 – 12	> 12
Chemical Oxygen Demand	mg/l	< 10	10 – 25	25 – 50	50 – 100	> 100
Dissolved Oxygen	mg/l	> 7	5 – 7	3 – 5	1 – 3	< 1
pH	-	> 7.0	6.0 – 7.0	5.0 – 6.0	< 5.0	> 5.0
Total Suspended Solid	mg/l	< 25	25 – 50	50 – 150	150 – 300	> 300
Water Quality Index (WQI)		> 92.7	76.5 – 92.7	51.9 – 76.5	31.0 – 51.9	< 31.0

Source: Environmental Quality Report 2019, Department of Environment (DOE)

5.8.7 Water Quality Trend

In assessing the present water quality near the study area, the baseline data are also compared to relevant water quality data (parameters) available from monitoring points by NREB and JBALB along the main rivers. **Table 5.8.9** shows the baseline water quality sampling points along the main rivers with reference to the monitoring points which are monitored by NREB and JBALB. The yearly average data from NREB (year 2015 to 2019) and JBALB (year 2016 to 2020) are appended as **Appendix 5.8.4a and Appendix 5.8.4b**.

Table 5.8.9: Monitoring Points by NREB and JBALB along Btg. Rajang and Btg. Baleh

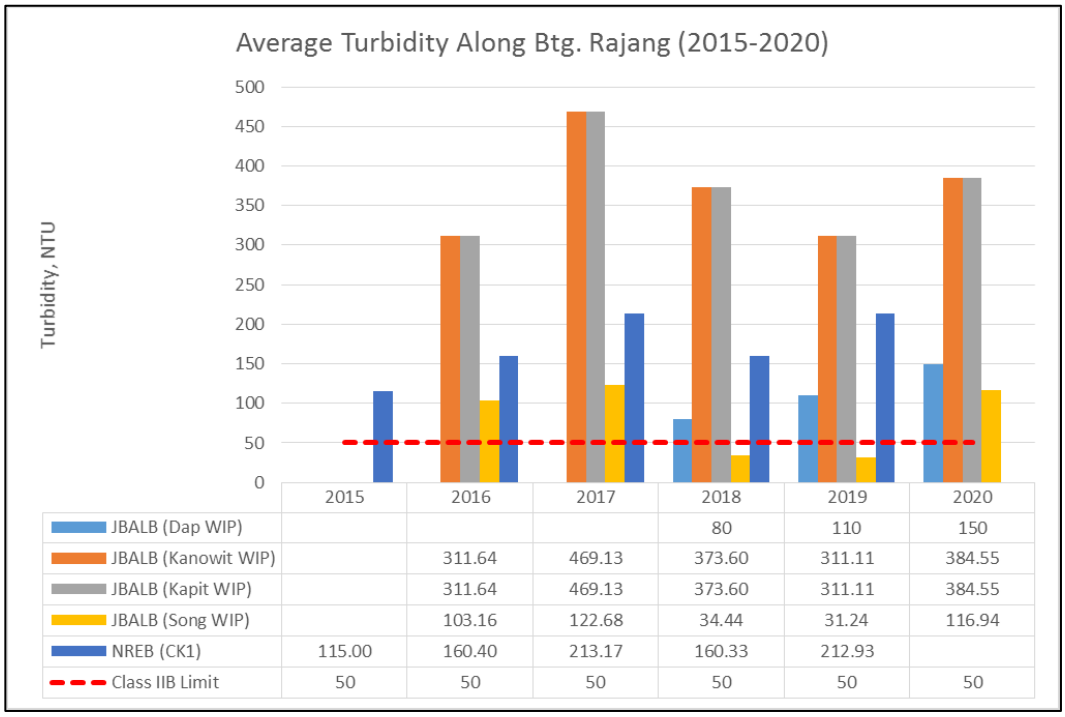
No.	Monitoring Points		
	ESIA Baseline Sampling	**NREB**	**JBALB**
1.	Btg. Rajang W1, W6, W11, W14, W16	CK1	Kanowit WIP *Note: Kanowit WIP located downstream in Sg. Kanowit, southern bank of Btg. Rajang.*
			Dap WIP
			Song WIP *Note: Song WIP located downstream of Sg. Katibas, southern bank of Btg. Rajang.*
			Kapit WIP
2.	Btg. Baleh W17, W18, W20, W23, W25	CB1	Entawau WIP
		CB3	
		-	

Note: WIP (Water Intake Point)

The yearly average data from relevant monitoring points by NREB and JBALB are used to show the trend of the existing water quality along the main rivers. This is with reference to the baseline water quality results obtained (refer **Table 5.8.4** and **Table 5.8.5**), particularly on non-compliance to the NWQSM Class IIB.

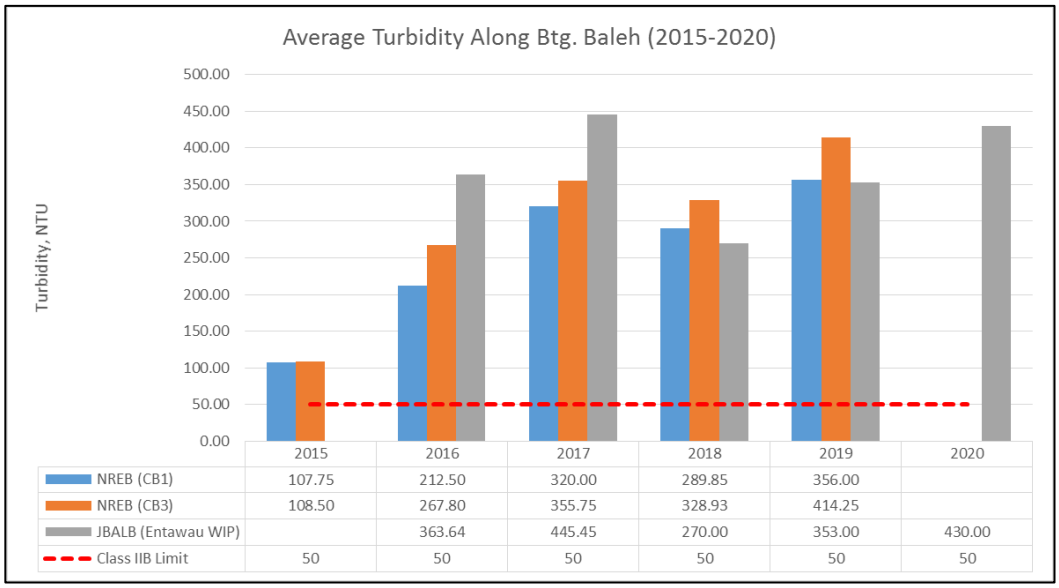
5.8.7.1 Turbidity

Based on **Figure 5.8.3** and **Figure 5.8.4**, turbidity along Btg. Rajang and Btg. Baleh generally are higher than the stipulated limit in the NWQSM Class IIB (50 NTU). Similar results are also reported by the baseline sampling results.



	2015	2016	2017	2018	2019	2020
JBALB (Dap WIP)				80	110	150
JBALB (Kanowit WIP)		311.64	469.13	373.60	311.11	384.55
JBALB (Kapit WIP)		311.64	469.13	373.60	311.11	384.55
JBALB (Song WIP)		103.16	122.68	34.44	31.24	116.94
NREB (CK1)	115.00	160.40	213.17	160.33	212.93	
Class IIB Limit	50	50	50	50	50	50

Figure 5.8.3: Average Turbidity along Btg. Rajang (2015-2020)

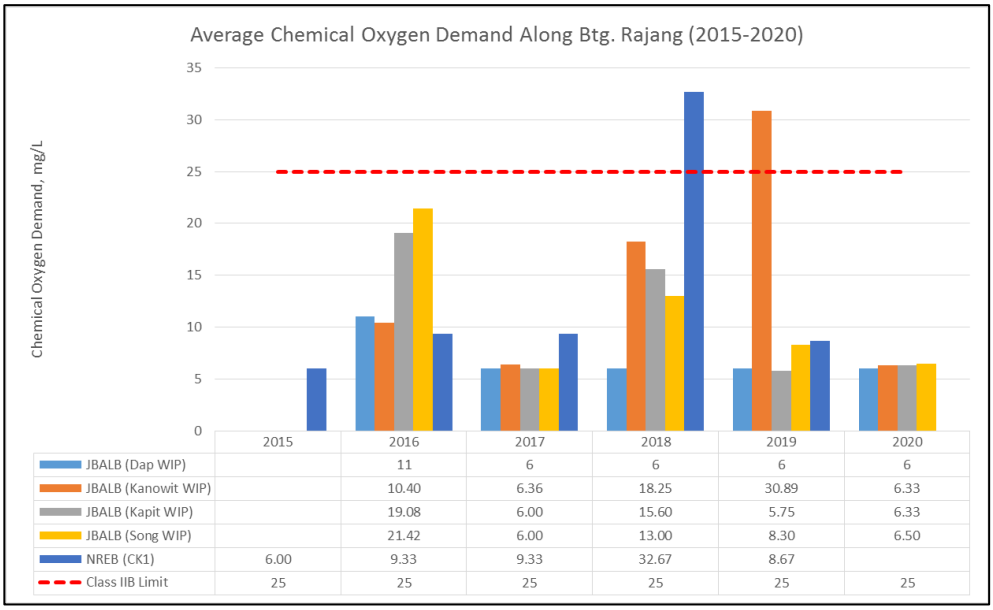


	2015	2016	2017	2018	2019	2020
NREB (CB1)	107.75	212.50	320.00	289.85	356.00	
NREB (CB3)	108.50	267.80	355.75	328.93	414.25	
JBALB (Entawau WIP)		363.64	445.45	270.00	353.00	430.00
Class IIB Limit	50	50	50	50	50	50

Figure 5.8.4: Average Turbidity along Btg. Baleh (2015-2020)

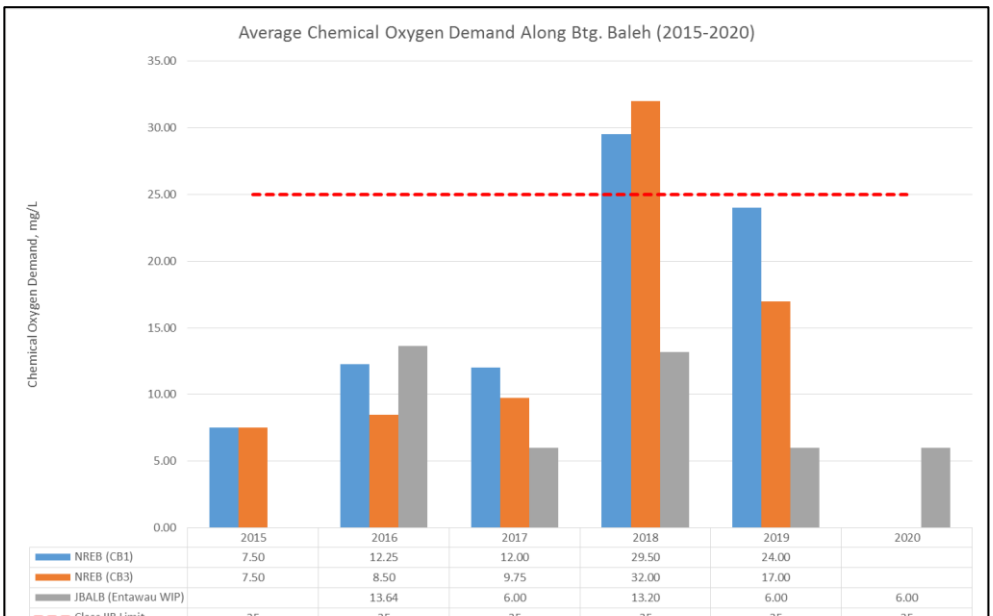
5.8.7.2 *Chemical Oxygen Demand*

The COD along the main rivers mostly showed compliance with the Class IIB limit. However, several points also showed non-compliance in 2018 and 2019 (refer **Figure 5.8.5** and **Figure 5.8.6**). Similar range can also be observed from the baseline sampling results.



	2015	2016	2017	2018	2019	2020
JBALB (Dap WIP)		11	6	6	6	6
JBALB (Kanowit WIP)		10.40	6.36	18.25	30.89	6.33
JBALB (Kapit WIP)		19.08	6.00	15.60	5.75	6.33
JBALB (Song WIP)		21.42	6.00	13.00	8.30	6.50
NREB (CK1)	6.00	9.33	9.33	32.67	8.67	
Class IIB Limit	25	25	25	25	25	25

Figure 5.8.5: Average Chemical Oxygen Demand along Btg. Rajang (2015-2020)



	2015	2016	2017	2018	2019	2020
NREB (CB1)	7.50	12.25	12.00	29.50	24.00	
NREB (CB3)	7.50	8.50	9.75	32.00	17.00	
JBALB (Entawau WIP)		13.64	6.00	13.20	6.00	6.00
Class IIB Limit	25	25	25	25	25	25

Figure 5.8.6: Average Chemical Oxygen Demand along Btg. Baleh (2015-2020)

5.8.7.3 Total Suspended Solids

Based on **Figure 5.8.7** and **Figure 5.8.8**, average TSS along Btg. Rajang and Btg. Baleh generally are higher than the stipulated limit in the NWQSM Class IIB (50 mg/L). Similar trend is also reported by several baseline water quality points which exceeded the stipulated limit. The surge in TSS observed in 2019 for Btg. Baleh may have been due to the increasingly active construction of the Baleh HEP main dam.

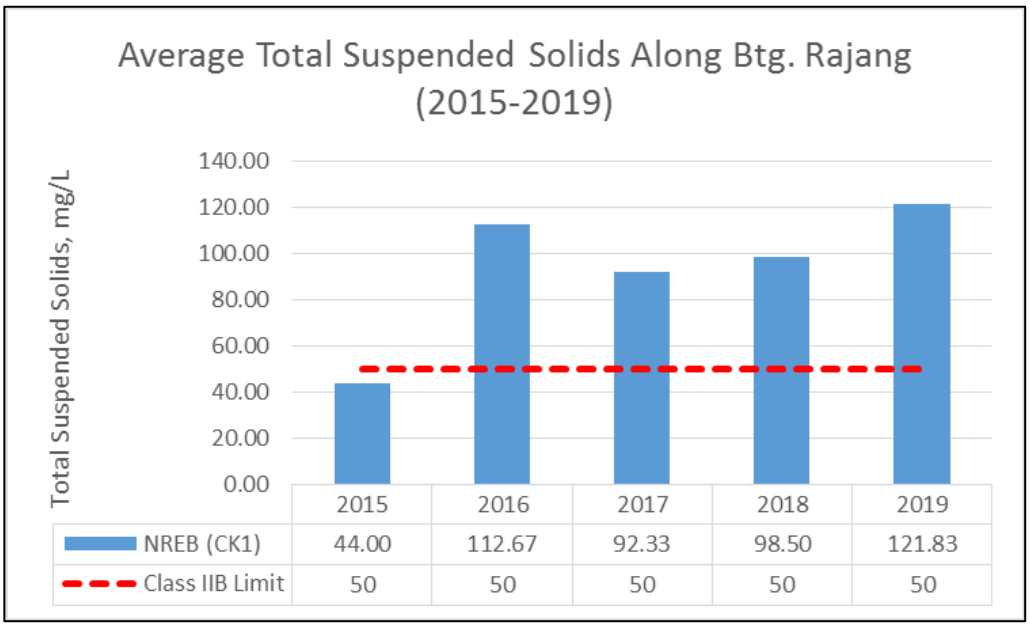


Figure 5.8.7: Average Total Suspended Solids along Btg. Rajang (2015-2019)

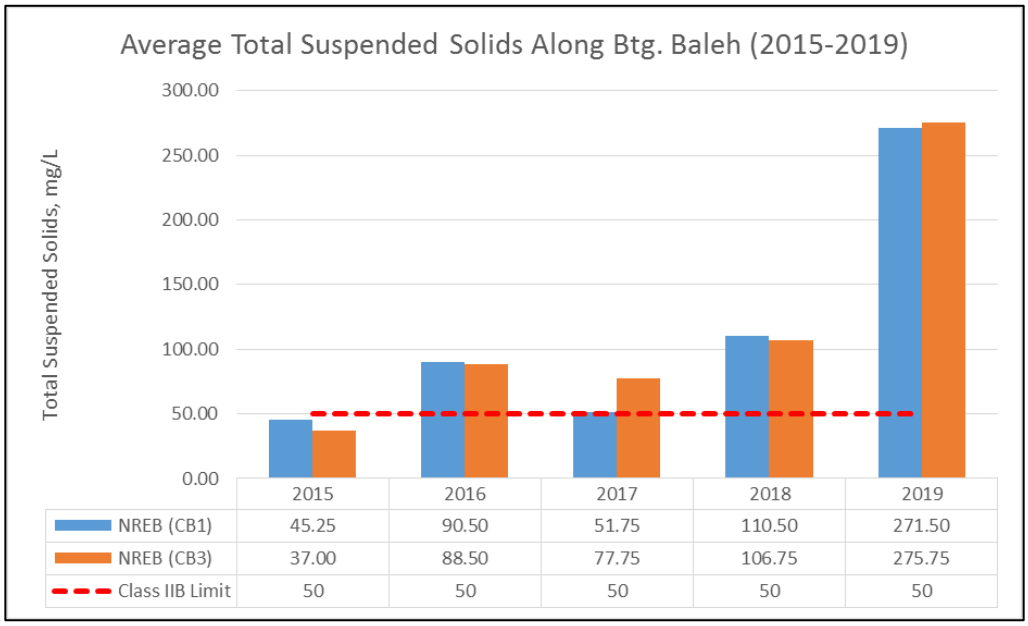


Figure 5.8.8: Average Total Suspended Solids along Btg. Baleh (2015-2019)

5.8.7.4 Total Coliform Count

Overall, the average TCC along Btg. Rajang and Btg. Baleh mostly showed compliance with the Class IIB stipulated limit (refer to **Figure 5.8.9** and **Figure 5.8.10**). However, the average TCC along Btg. Baleh is showing a steady increasing trend from 2015 to 2019. Similarly, most of the baseline water quality results showed compliance with the Class IIB limit.

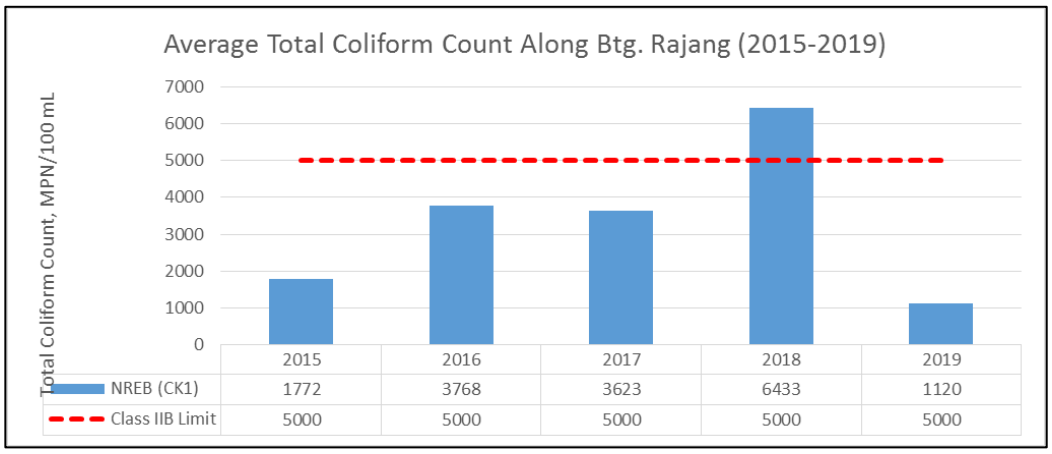


Figure 5.8.9: Average Total Coliform Count along Btg. Rajang (2015-2019)

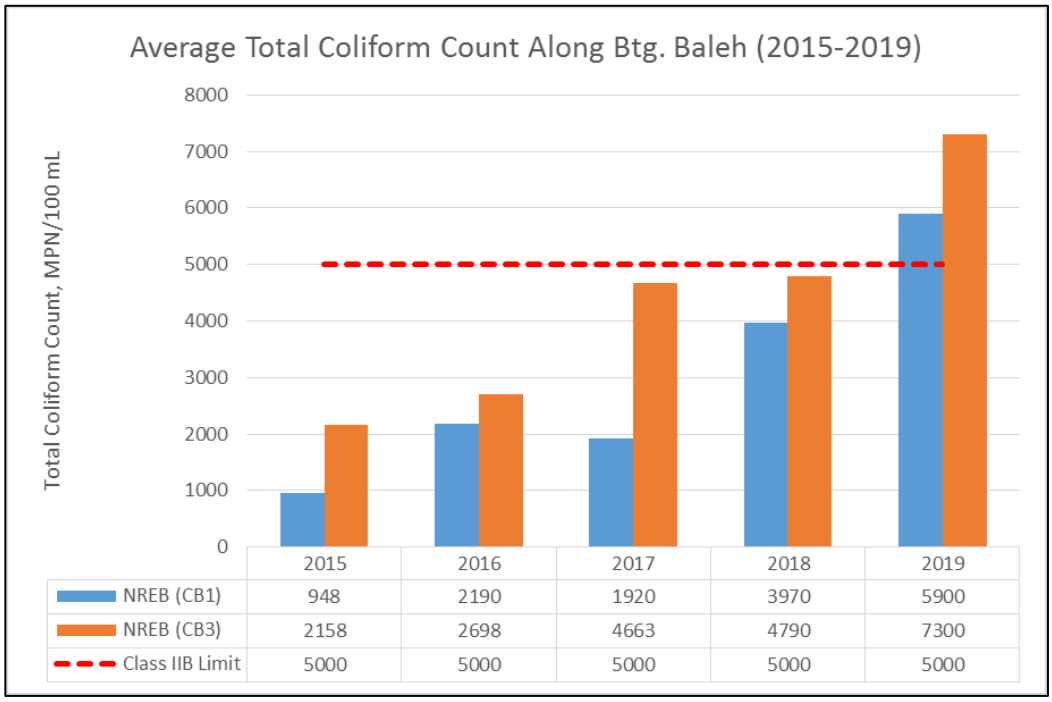


Figure 5.8.10: Average Total Coliform Count along Btg. Baleh (2015-2019)

5.8.7.5 Faecal Coliform Count

Based on **Figure 5.8.11** and **Figure 5.8.12**, the average FCC along Btg. Rajang and Btg. Baleh are generally higher than the stipulated limit in the NWQSM Class IIB (400 MPN/100 mL). Higher FCC values are observed in the results of samples from Btg. Baleh. The baseline water quality results showed similar trend.

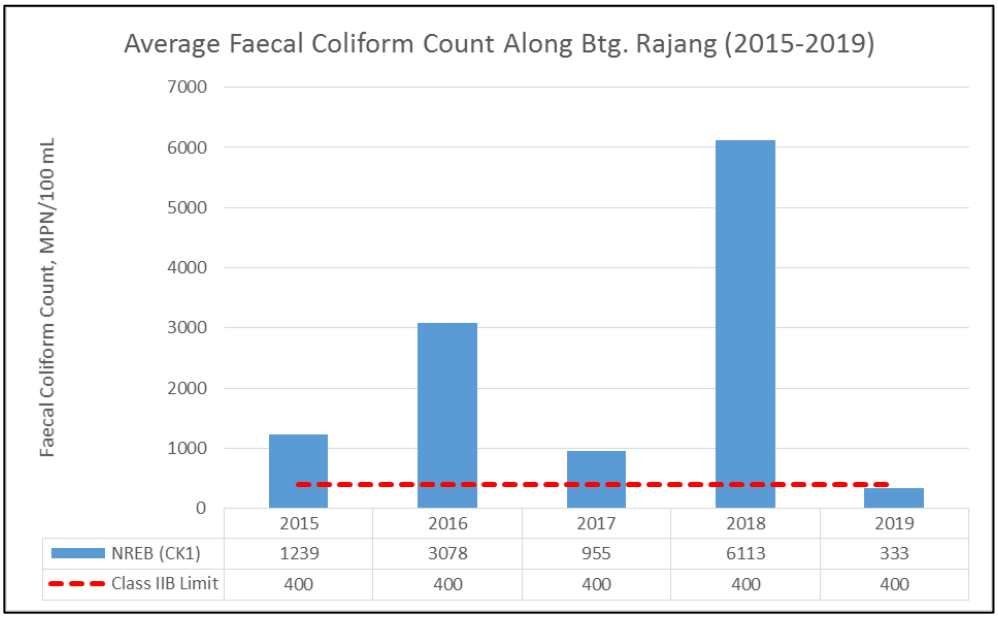


Figure 5.8.11: Average Faecal Coliform Count along Btg. Rajang (2015-2019)

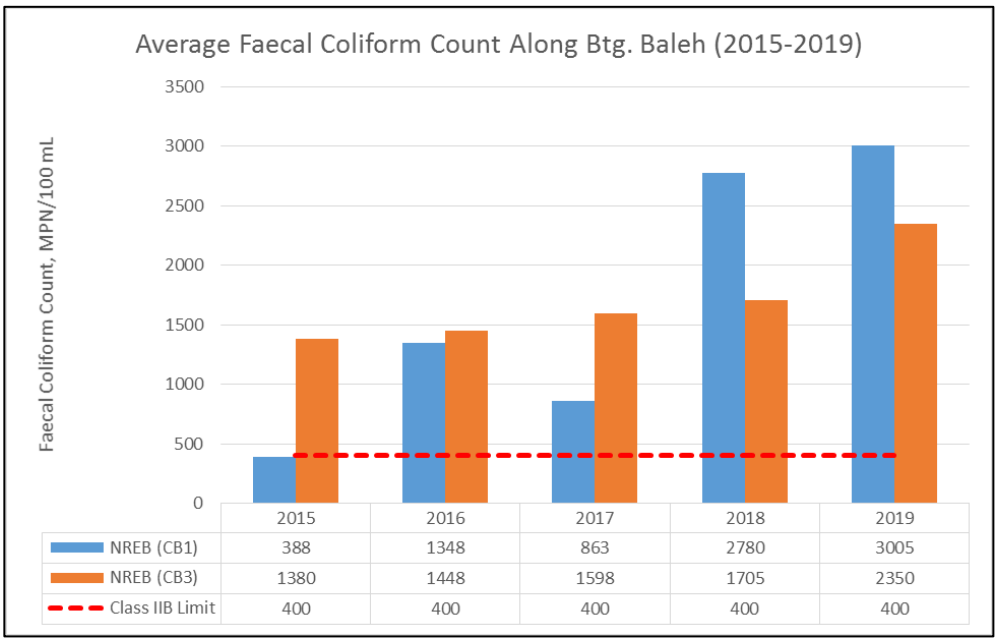


Figure 5.8.12: Average Faecal Coliform Count along Btg. Baleh (2015-2019)

5.8.7.6 Copper (as Cu)

The average copper concentration along Btg. Rajang and Btg. Baleh are all within the Class IIB limit (refer **Figure 5.8.13** and **Figure 5.8.14**). However, Copper concentration at baseline water sampling point, W14 recorded value of 0.26 mg/L which exceeded the stipulated limit. The nearest monitoring point to W14 is the

Kapit WIP (JBALB) whereby all data showed compliance during the monitoring period.

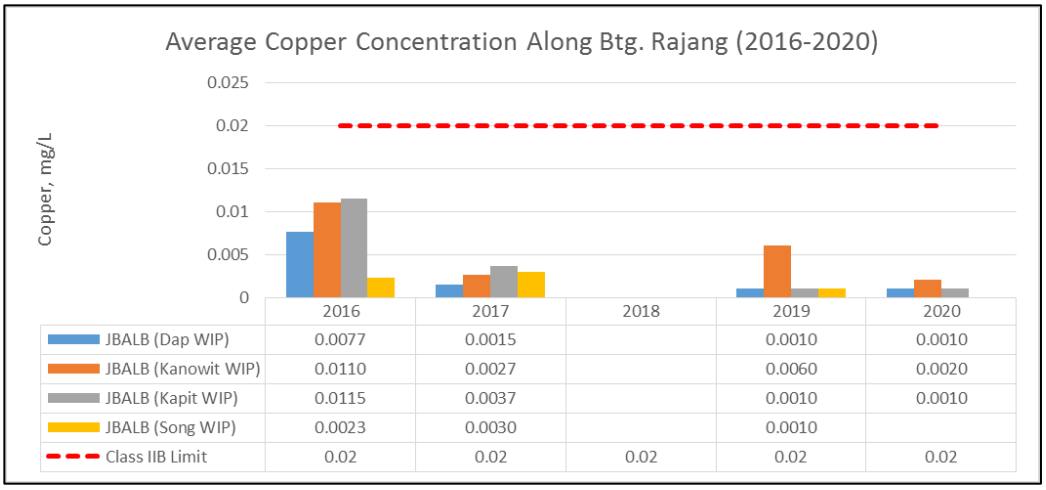


Figure 5.8.13: Average Copper Concentration along Btg. Rajang (2016-2020)

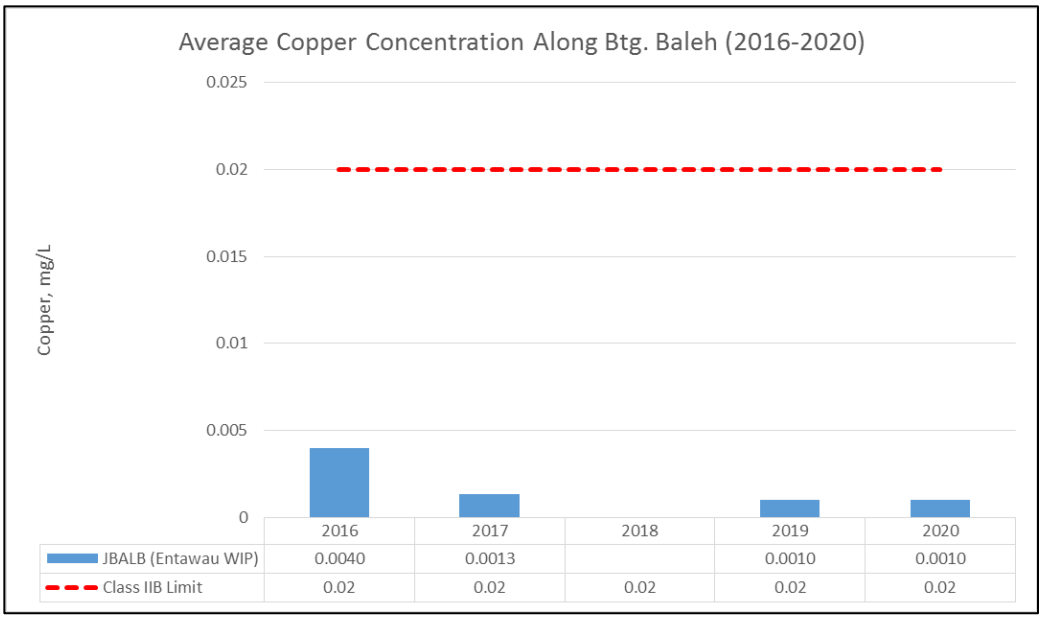


Figure 5.8.14: Average Copper Concentration along Btg. Baleh (2016-2020)

5.8.7.7 Iron (as Fe)

Based on the average data, a decreasing trend for iron concentration can be observed for both Btg. Rajang and Btg. Baleh (refer **Figure 5.8.15** and **Figure 5.8.16**). Based on the baseline sampling results however, iron concentration in all samples along Btg. Rajang and Btg. Baleh exceeded the stipulated limit.

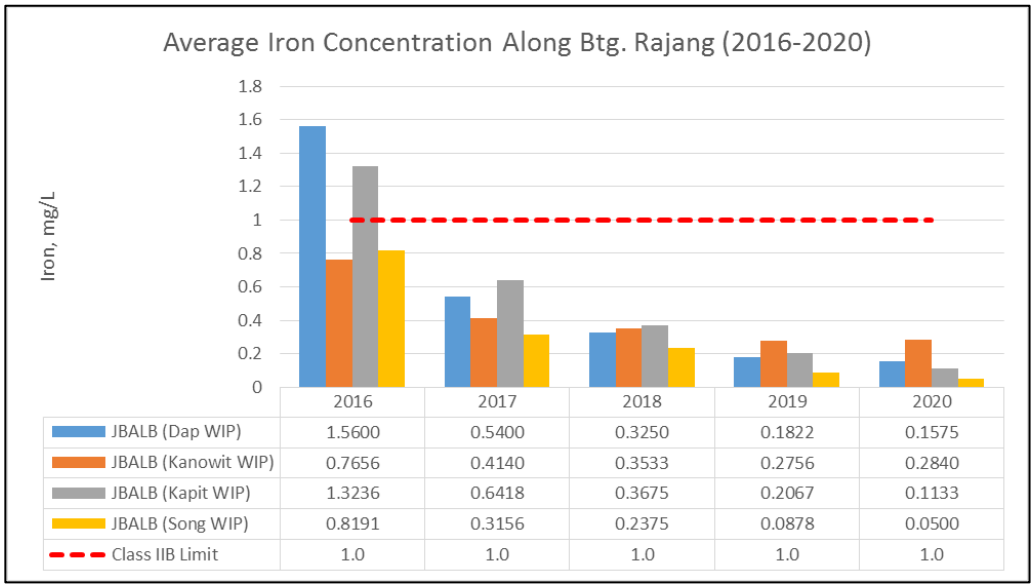


Figure 5.8.15: Average Iron Concentration along Btg. Rajang (2016-2020)

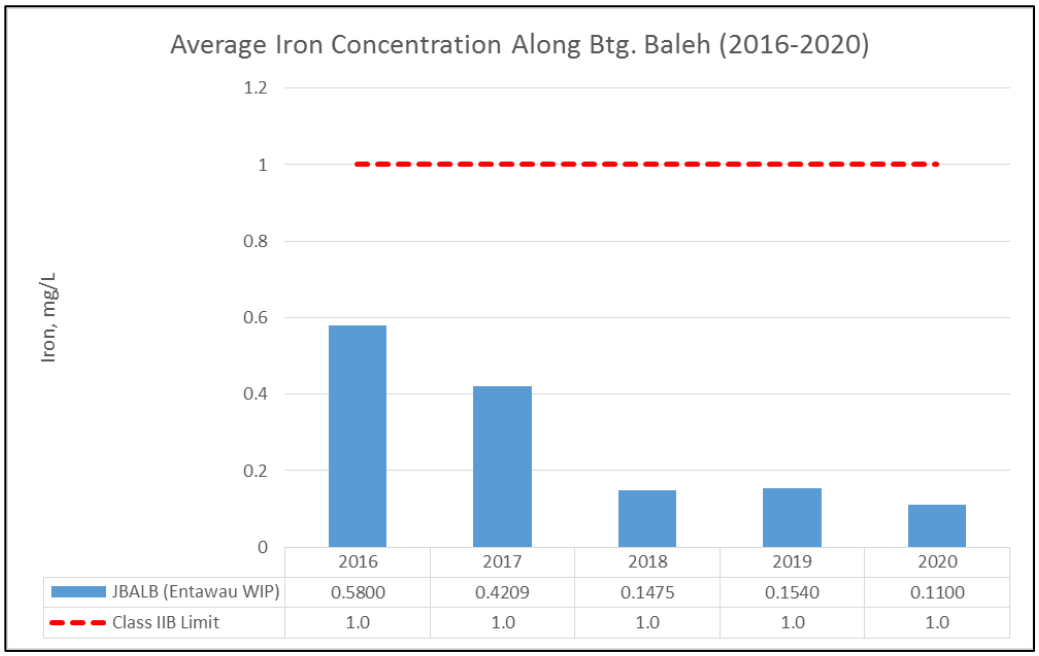


Figure 5.8.16: Average Iron Concentration along Btg. Baleh (2016-2020)

5.8.7.8 Arsenic (as As)

The average Arsenic concentration along Btg. Rajang and Btg. Baleh are well below the Class IIB limit during the monitoring period (refer **Figure 5.8.17** and **Figure 5.8.18**). The baseline water quality results showed similar trend.

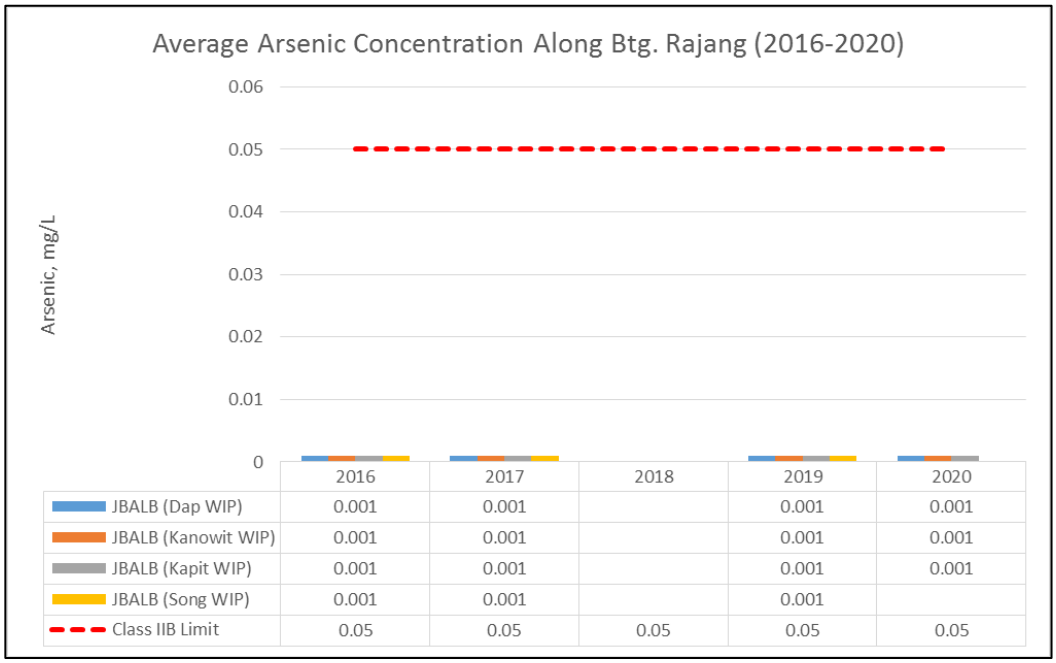


Figure 5.8.17: Average Arsenic Concentration along Btg. Rajang (2016-2020)

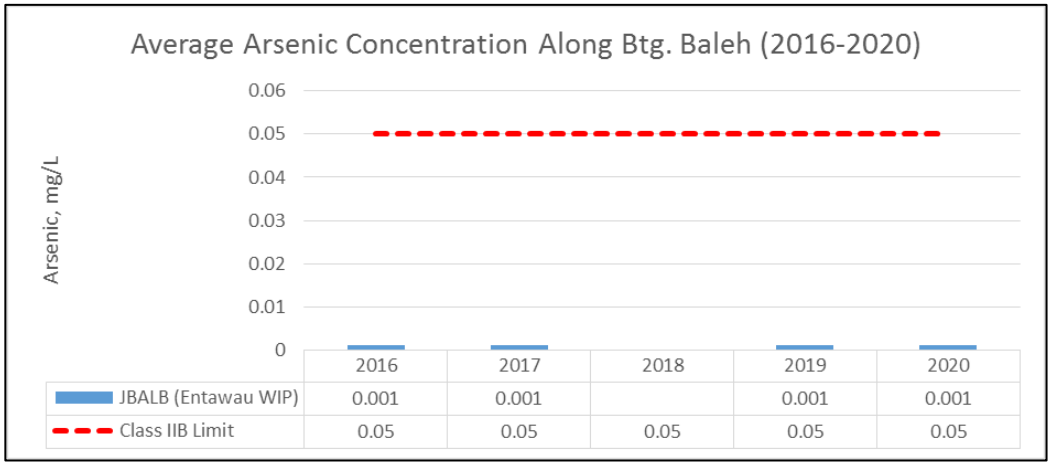


Figure 5.8.18: Average Arsenic Concentration along Btg. Rajang (2016-2020)

5.8.8 Impact of Baleh HEP Construction on Water Quality

Data from previous SEIA for Baleh HEP as well as other more recent reports are referred as secondary information, were relevant. These reports are the sub-projects related to the Baleh HEP as well as other projects near the proposed BMTLP.

The SEIA for Baleh HEP data serves as the baseline prior to construction of the dam while selected data from recent EIAs, EMPs, and EMRs in the area will show changes to the water quality during construction of the Baleh HEP. By comparing

the water quality prior to the Baleh HEP construction and water quality during construction, impact from the construction of the main Baleh HEP on the water quality on the main rivers particularly Btg. Baleh can be observed.

Table 5.8.10: Water Quality Index Comparison

Project Title	Sampling Points [Date]	WQI*	Class	WQ Status
SEIA for Baleh HEP (Baseline)				
SEIA for the Proposed Baleh Hydroelectric Project Kapit Division, Sarawak Proponent: Sarawak Energy Berhad Ref: EV103-580	W1 Btg. Baleh downstream of the proposed Baleh HEP, at the confluence with Merirai river. [Nov-2012]	82	II	C
	W5 Sg. Putai, Entawau river, a tributary of Btg. Baleh. [Nov-2012]	92	I	C
EMP/EIA related to SEIA for Baleh HEP				
EMP for Construction of the Proposed Baleh Hydroelectric Project (Package 4) – Diversion Tunnels, Baleh, Kapit Division, Sarawak Proponent: Sinohydro Corporation (M) Sdn Bhd Ref: EV110-333(1)	W4 Downstream of the outlet of the diversion tunnel on Btg. Baleh. [EMR data: Oct-2020]	80	II	SP
EMP for Construction of the Proposed Baleh Hydroelectric Project: Main Dam - Civil Works Proponent: China Gezhouba Group Company Ltd Ref: EV110-332	W7 Downstream of the outlet of the diversion tunnel on Btg. Baleh. [EMR data: Oct-2020]	85	II	C
	W8 5 km downstream of Project site. [EMR data: Oct-2020]	77	II	SP
EMP for Proposed Construction and Completion of Jetty C, Road and Bridges for Baleh Hydroelectric Project Proponent: Perbena Emas Sdn Bhd Ref: EV110-321	W4 Sg. Putai [Oct-2017]	81	II	SP

Project Title	Sampling Points [Date]	WQI*	Class	WQ Status
Other EMP/EIA				
EIA for the Proposed Sand and Gravel Dredging Along Baleh River from Nanga Sungai Sut to Nanga Sungai Putai, Baleh, Kapit Division, Sarawak Proponent: Magna Balleh Mining Sdn. Bhd. Ref: EV103-740	W1 Confluence of Sg. Sut and Btg. Baleh. [Mar-2019]	81	II	C
	W2 Confluence of Sg. Mujong and Btg. Baleh. [Mar-2019]	87	II	C
	W3 Confluence of Sg. Suau and Btg. Baleh. [Mar-2019]	80	II	SP
	W4 Confluence of Sg. Gaat and Btg. Baleh. [Mar-2019]	86	II	C
	W5 Confluence of Sg. Pulang and Btg. Baleh. [Mar-2019]	78	II	SP
	W6 Confluence of Sg. Entuloh and Btg. Baleh. [Mar-2019]	91	II	C
	W7 Confluence of Sg. Sekajang and Btg. Baleh. [Mar-2019]	91	II	C
	W8 Confluence of Sg. Putai and Btg. Baleh. [Mar-2019]	88	II	C

** Based on latest EMR data or the EIA/EMP baseline data (if EMR data not available for the particular project)*

SP = Slightly Polluted, C = Clean

Based on the WQI on **Table 5.8.10**, the status of Btg. Baleh prior to the Baleh HEP construction was categorized as clean. During the Baleh HEP construction, monitoring reports from various EMP and EIA shows that the Btg. Baleh river is slightly polluted especially for sampling points closer to the proposed Baleh Dam.

This result is expected with the ongoing construction of the Baleh HEP and will vary depending on the construction activities. It is also noted that other projects along the Btg. Baleh as listed above may have contributed to the pollution load in Btg. Baleh.

Going downstream, the water quality would improve and mostly reported to be clean before the confluence with Btg. Rajang. Similar WQI was also reported in the baseline water quality for the transmission line Project.

5.8.9 Flood Events in Kapit District 1946-2020

Floods are common in the lower Btg. Baleh and Btg. Rajang where a combination of heavy rainfall, high tide level and poor drainage contribute to flood events. Flooding often happens at the riverbank areas. The proposed transmission line is located on generally hilly area, further inland and therefore not prone to flood.

Historical flood events in Kapit relevant to the proposed transmission line are listed in **Table 5.8.11**. Based on the flood level record below, the highest flood level was 20 ft (6 m) above ground level that took place in January/February 1963. It was recorded as the worst event in Sarawak history.

No flood event was recorded for Kapit between 2006 to 2011 and 2014 to 2016. Between 2017 to 2020, the highest flood level of 3 m was recorded at Kapit Wharf, along the Btg. Rajang on 14 Sept, 2020. Kapit Wharf is about 2.8 km south of the proposed transmission line. The Song wharf, located further downstream of Btg. Rajang and about 3.2 km south of the proposed transmission line, recorded a flood height of 2.5 m during the same flood event.

Along Btg. Baleh, areas such as SK Temenggong Koh, Nanga Entawau and Rh. John Katil was also affected by the same flood event, with level between 1.0 m to 2.7 m. Nanga Entawau is a longhouse cluster located at an elevation of 80 m AMSL, about 10 km downstream of Baleh HEP and about 800 m south of the proposed transmission line.

In year 2020, 12 flood events were recorded for Kapit District. These took place in the month of April (1), May (1), September (9) and December (1). Continuous rain, upstream of Btg. Baleh area and the riverbank of Btg. Rajang are generally the cause of the flooding along the main rivers and low-lying areas.

Plate 5.8.9: The Teachers' quarters, dining hall and assembly hall of SK Temenggong Koh, Nanga Entawau under water in Sept 2020. Btg. Baleh is in the background.

Source: Borneo Post Online, 15 Sept 2020 (Many riverine areas in Kapit hit by flood) - https://www.theborneopost.com/2020/09/15/many-riverine-areas-in-kapit-hit-by-flood/

Table 5.8.11: Flood Events in Kapit District

Events	Affected Flood Areas	Flood Height	Remarks
Dec 1954	Lower Btg. Rajang	2 – 3 ft	
Oct 1955	Kapit, Sibu	5 ft	
July 1959	Upper Btg. Rajang, Sibu	Kapit town partially submerged	
March 1961	Upper Btg. Rajang, Sibu	Kanowit shophouses under 2 – 3 ft of water	
Jan – Feb 1963	Whole Sarawak affected	20 ft	Worst event in Sarawak history
Nov 1968	Engkelili, Btg. Rajang, Kapit, Kanowit, Sibu	3 – 6 ft	Sibu hit severely
Jun/Dec 1982	Upper Rajang	1 – 18 ft	
Sept 1983	Upper Btg. Rajang (Kapit)	3 – 10 ft	

Events	Affected Flood Areas	Flood Height	Remarks
Feb 1994	Belaga, Kapit, etc.	10 ft	Severe flooding at upper Btg. Rajang
Dec 1999	Btg. Rajang	0.2 – 1.0 m	
Feb 2001	Btg. Rajang (Whole of Sibu Town)	0.1 – 2 m	Worst since 1963
Mac 2002	Btg Rajang (Sibu Town)	0.1 – 0.3 m	Flash flood
25 – 28 Jan 2004	Sibu Town, Btg. Rajang	0.3 – 1 m	Claimed 3 lives
	Kapit	1 – 1.5 m	
3 – 10 Apr 2005	Kapit	0.3 – 1.2 m	Continuous rain
3 Nov 2012	Jalan Sesibau/ Rh. John at Sg. Sesibau, Kapit and Khoo Peng Loong Road, Kapit	0.4 – 0.5 m	Continuous heavy downpour since 02 Nov 2012
2 Jan 2013	Rh. Jala, Sg. Melinau, Kapit	2 m	Heavy torrential rain since 01 Jan 2013. 609 people from 35 families affected. Estimated loss about RM 1 Million
30 Aug 2013	Shop houses at Bazaar Baru, Taman Siew Gin, low-lying residential areas along Jalan Selirik, junction of Taman Pacific, junction of Tatai Kenyalang and Selepong 3, road along Taman Ixora and Taman Indah and Taman Bintang, Kapit	0.1 – 0.35 m	Heavy torrential rain that began shortly after 7.00 pm on 30 Aug 2013
15 Mac 2016	Punan Bah, Kapit	0.43 m	Heavy rainfall and rainwater from upstream.
15 Aug 2017 @ 0400 am to 1200 pm	SK Nanga Sempili, Kapit	0.3 m - 1.8 m	Continuous heavy rainfall
15 Aug 2017 @ 0600 am to 1100 am	SMK Balleh, Kapit	0.1 m-0.3 m	Continuous heavy rainfall
24 Nov 17 @0600 am	SK Nanga Sempili, Sk. Nanga Kain, Kapit	0.3 m – 1.5 m	Overflowing water from Btg. Baleh
04 Feb 2018 @0700 am	Selirik, Kapit	0.2 – 0.7 m	King Tide

Events	Affected Flood Areas	Flood Height	Remarks
07 Feb 2018 @ 0800 am	SK Nanga Beguang Song, Kapit	0.3 – 0.6 m	Moderate heavy rainfall coincides with King Tide and low-lying area.
09 Dec 2018 @0830 am	SK Nanga Sempili, Kapit	0.5 m	Heavy rainfall from the upstream area coincides with King Tide causing the water from Btg. Balleh to overflow.
10 Dec 2019 @1100 am	Long Busang, Belaga, Kapit	1.0 m – 1.3m	Continuous rain at the upstream and flooded area located at the mouth of Btg. Balui river and Bulan river which causes the water overflow into low-lying area.
13 Dec 2019 @1510 pm	SK Temenggong Koh, Kapit	0.6 m	Continuous rain and concide with big tide.
26 Apr 2020 @ 2115 pm – 27 Apr 2019 @0300 am	Melatai 1, Simpang Bawah, Jalan Selirik, Kapit	0.15 m – 0.3m	Poor drainage from the intersection of Police Station, Taman Pasifik to Selepong 3, Jalan Selirik.
13 May 2020 @ 0600 am	Rh. Seking, Sub-District of Nanga Merit	1.0 m	Rained coincided with high tide and water release from Bakun Dam.
06 Sept 2020 @1100 am	Song Wharf, Song, Kapit	2.5 m	Rained at the upstream of Btg. Baleh led to increase water level at Btg. Rajang and overflow at Song Wharf.
06 Sept 2020 @1700 pm	Kpg. Baru, Kapit	0.3 – 0.5 m	Continuous rain upstream of Btg. Baleh and area near Sg. Kapit and Btg. Rajang led to water from Sg. Kapit overflow into low-lying area.
07 Sept 2020 @0000 am	Kpg. Muhibbah, Kapit	0.2 m	Continuous rain upstream of Btg. Baleh and area near Sg. Kapit and Btg. Rajang led to water from Sg. Kapit overflow into low-lying area.
13 Sept 2020 @1000 am	SMK Balleh	0.5 – 1.0m	Continuous rain upstream of Btg. Baleh leading to increase of water level at Btg. Rajang that overflows to low-lying area.
	SK Temenggong Koh	1.0 – 2.7m	
	Kpg. Muhibbah, Kapit	0.06 – 0.3 m	

Events	Affected Flood Areas	Flood Height	Remarks
13 Sept 2020 @1200 pm	Kpg. Baru, Kapit	0.15 – 1.0 m	Continuous rain upstream of Btg. Baleh that flooded area closed to Sg. Kapit and Sg. Sibau leading to the overflow of water to low-lying area.
	Rh. John Anak Ramba	0.3 - 1.7 m	
13 Sept 2020 @1300 pm	Song Wharf, Song, Kapit	2.4 m	Rain upstream of Btg. Baleh led to increase water level of Btg. Rajang and flooded the wharf area.
13 Sept 2020 @1625 pm	Rh. Jerami, Sungai Sebenda, Kapit	1.0 m	Continuous rain upstream of Btg. Baleh led to the rise of water level at Btg. Rajang and overflow the low-lying area.
	Tadika KEMAS, Rh. Bengau	0.5 m	
	Rh. Philimon, Asal Bawai, Kapit	1.0 m	
	SK Nanga Bawai, Kapit	1.0 m	
13 Sept 2020 @1700 pm	Rh. Rentap Anak Batang, Kapit	0.15 – 0.9 m	Rain upstream of Btg. Baleh causing the rise of water level of Btg. Rajang that overflows into areas near the riverbank.
	Rh. Unggam Nanga Entawau Balleh, Kapit	0.3 m	
	Rh. James Anek Bandak Nanga Sempili, Kapit	1.2 m	
	Rh. Pangau Anak Semada Nanga Kemali, Kapit	0.15 – 2.1 m	
	Rh. John Katil Kerangan Ara, Kapit	2.1 m	
14 Sept 2020 @0700 am	Kapit Wharf	3.0 m	Continuous rain upstream of Btg. Baleh and Btg. Rajang.
10 Dec 2020 @0600 am	SK Nanga Trusa, Kapit	1.5 m	Rain and overflow of Sg. Belawai.

Source: https://did.sarawak.gov.my/page-0-0-1451-Recorded-Flood-Event-in-Sarawak-P16.html

5.9 AIR QUALITY

Construction activities associated with the proposed transmission line have the potential to impact on air quality. These impacts need to be considered in terms of the existing airshed, with more focus on areas where the baseline airshed is close to or in excess of air quality standards. No impacts are anticipated in the operational phase, as there are no significant sources of emissions.

The primary sources of emissions anticipated are Particulate Matter (PM_{10} and $PM_{2.5}$) from construction vehicles exhaust emissions, construction vehicles movement on unpaved roads and access roads, concrete batching (if any), earthwork activities and fires. PM_{10} and $PM_{2.5}$ are measures of coarse particles in the air including dust, dirt, soot, smoke, and liquid droplets.

Sulphur dioxide (SO_2), Nitrogen dioxide (NO_2) and Carbon monoxide (CO) are not included in this ESIA study. These gasses are emitted from combustion sources and almost exclusively manmade. These include sources from road traffic, industrial activities, power generation using fossil fuels, cooking fires, etc. As such, these gasses will only be elevated in built up areas, in particular in urban and developed areas, e.g., urban centres, heavily trafficked roads and dense industrial area. The proposed BMTLP does not pass through such areas. The area is considered as rural, sparsely populated and mostly covered by forest and vegetation. Along the route there are a number of settlements (longhouses), scattered along the riverbanks, some of which construction traffic will pass through. Therefore, the ambient level of these gasses is not expected to approach air quality standards.

5.9.1 Ambient Air Quality

The existing ambient air quality level for PM_{10} and $PM_{2.5}$ was sampled at ten (10) locations from 1st December to 18th December 2020. They were measured over a period of 24 hours each. The sampling locations are primarily chosen close to human settlements within the impact zone (transmission line and access roads corridor and river corridor) and major river crossings, where physical activities are expected to be more pronounced (see **Figure 5.8.2** and **Plate 5.9.1** to **Plate 5.9.10**). The description of the baseline air sampling locations and results is presented in **Table 5.9.1** while the test report is appended in **Appendix 5.9.1**.

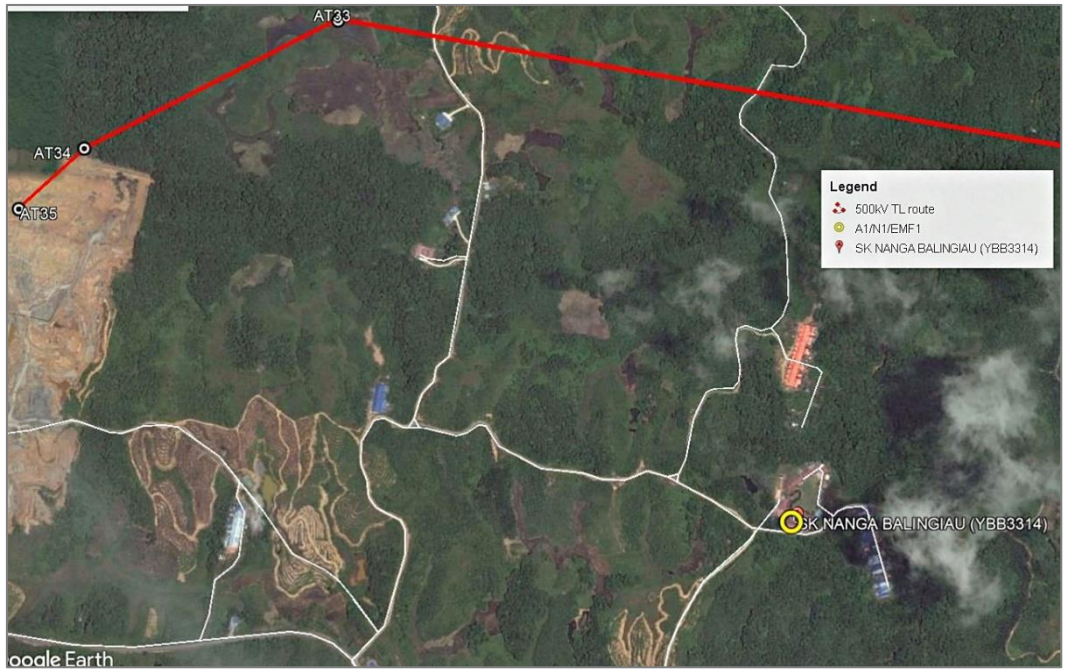
The value obtained is compared against the Malaysian Ambient Air Quality Standard (MAAQS) (**Appendix 5.9.2**) as well as international standards set out in the WHO Air Quality Guidelines Global Update 2005 (**Appendix 5.9.3**).

With its dense forest cover, low population density and little industry, the air quality of Kapit and its surrounding area is relatively very good. All PM_{10} and $PM_{2.5}$ level were significantly lower than the MAAQS and WHO standards. The results indicate dust or airborne pollutants does not pollute the area. The highest PM_{10} level was recorded at A8 (4.13 µg/m^3) and A4 (4.01 µg/m^3). These are located at longhouse compound where there are unpaved surface and close to unpaved roads.

Table 5.9.1: Air Quality Sampling Points and Results

Station	Coordinates	Location	Category	Distance from Transmission line	Date	Gaseous Concentration (24 hrs)		MAAQS (2020)* (24 hrs)	WHO Standards** (24 hrs)
A1	02° 06'46.12"N 112° 17'20.52"E	SK Nanga Balingiau	School	900 m	1 – 2 Dec 20	PM_{10}	2.07	100	50
						$PM_{2.5}$	1.15	35	25
A2	02° 02'7.46"N 112°25'31.45"E	SK Nanga Beguang, Rh. Richard Nujong, Nanga Beguang	School Residential	1.7 km	2 – 3 Dec 20	PM_{10}	3.98	100	50
						$PM_{2.5}$	1.59	35	25
A3	02° 0'36.37"N 112° 32'55.04"E	Song	Bazaar	3.3 km	3 – 4 Dec 20	PM_{10}	3.70	100	50
						$PM_{2.5}$	1.87	35	25
A4	02° 01'3.22"N 112° 42'58.28"E	Rh. Bubut Benang, Sg. Ibau	Residential	1.8 km	6 – 7 Dec 20	PM_{10}	4.01	100	50
						$PM_{2.5}$	0.54	35	25
A5	02° 0'59.40"N 112° 56'23.23"E	Kapit	Town	2.8 km	4 – 5 Dec 20	PM_{10}	2.75	100	50
						$PM_{2.5}$	1.10	35	25
A6	02° 01'45.09"N 113° 8'26.93"E	Rh. Anting, Batu Bansu	Residential	480 m	7 - 8 Dec 20	PM_{10}	3.43	100	50
						$PM_{2.5}$	1.33	35	25
A7	01° 58'32.54"N 113° 15'8.18"E	Rh. Wong	Residential	2.2 km	8 – 9 Dec 20	PM_{10}	3.16	100	50
						$PM_{2.5}$	1.00	35	25
A8	01°53'5.12"N 113° 27'12.44"E	Rh. Sana, Nanga Staba	Residential	700 m	18 – 19 Dec 20	PM_{10}	4.13	100	50
						$PM_{2.5}$	1.03	35	25
A9	01°49'18.43"N 113° 40'46.22"E	Rh. Lucas Laso, Nanga Entawau	Residential	950 m	17 – 18 Dec 20	PM_{10}	3.66	100	50
						$PM_{2.5}$	0.63	35	25
A10	01° 48'39.67"N 113° 45'31.14"E	Putai Camp	Residential	835 m	16 – 17 Dec 20	PM_{10}	3.15	100	50
						$PM_{2.5}$	0.65	35	25

Source: **Malaysia Ambient Air Quality Standard (MAAQS), 2013*
***WHO Air Quality Guidelines Global Update, 2005*

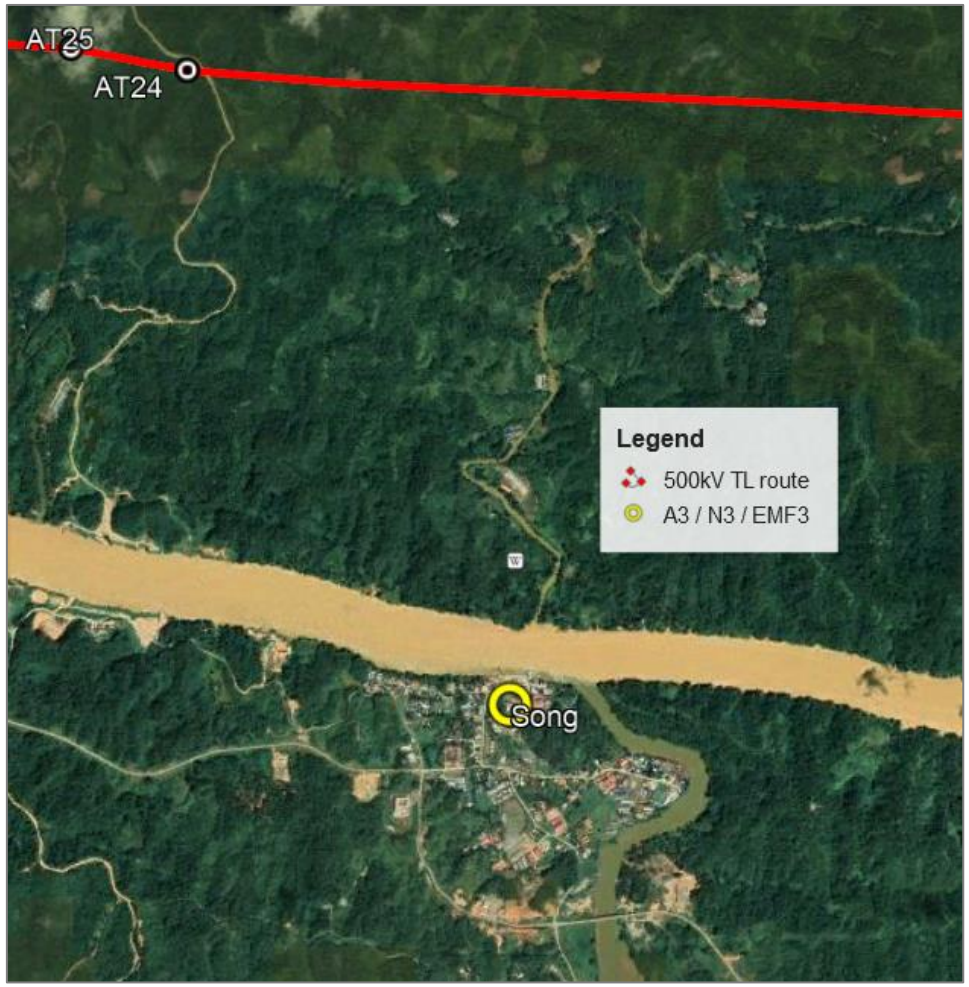


Source: Google Earth, 2021

Plate 5.9.1: Monitoring Station 1 for Air, Noise and EMF – SK Nanga Balingiau

Source: Google Earth, 2021

Plate 5.9.2: Monitoring Station 2 for Air, Noise and EMF – SK Nanga Beguang (School), Rh. Richard Nujong



Source: Google Earth, 2021

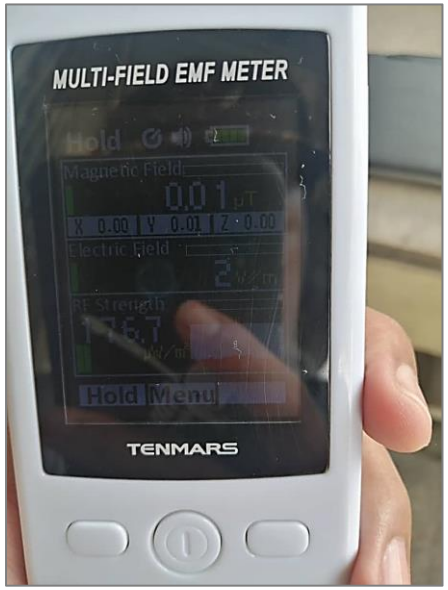
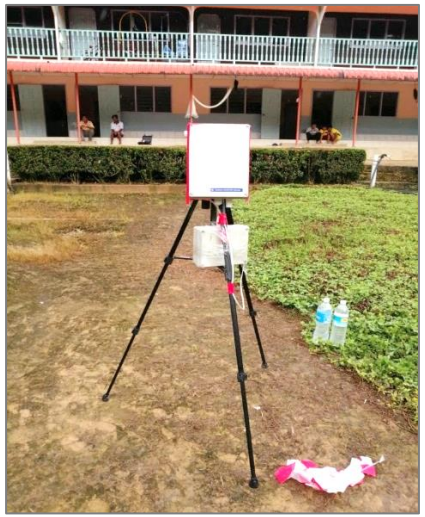
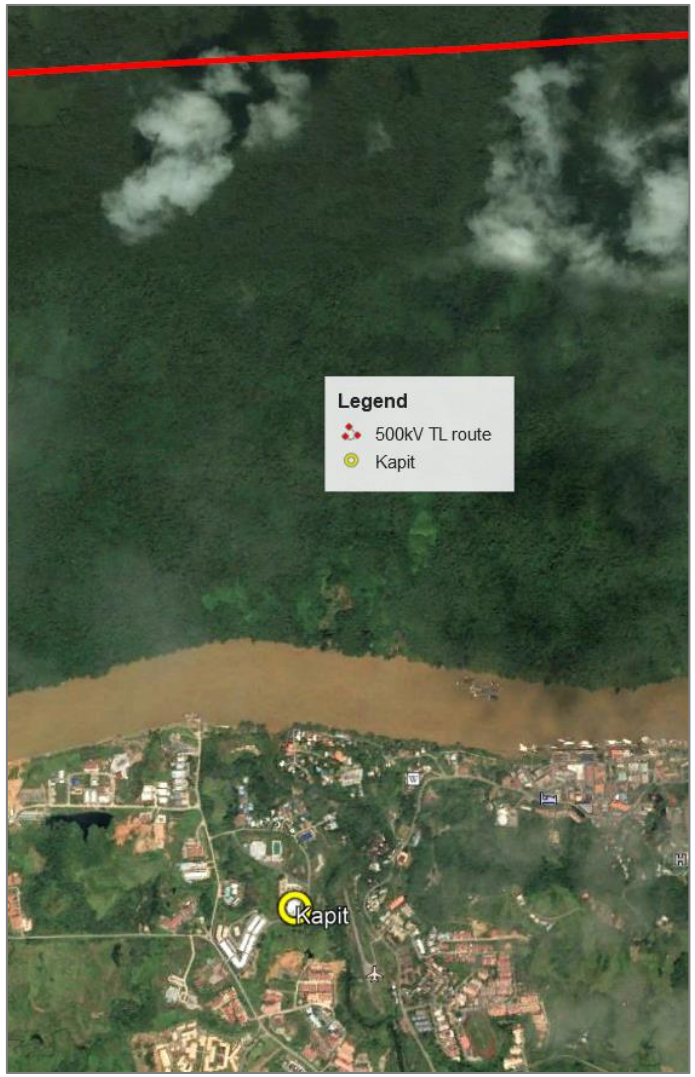


Plate 5.9.3: Monitoring Station 3 for Air, Noise and EMF – Song (bazaar)



Source: Google Earth, 2021

Plate 5.9.4: Monitoring Station 4 for Air, Noise and EMF – Rh. Bubut Benang

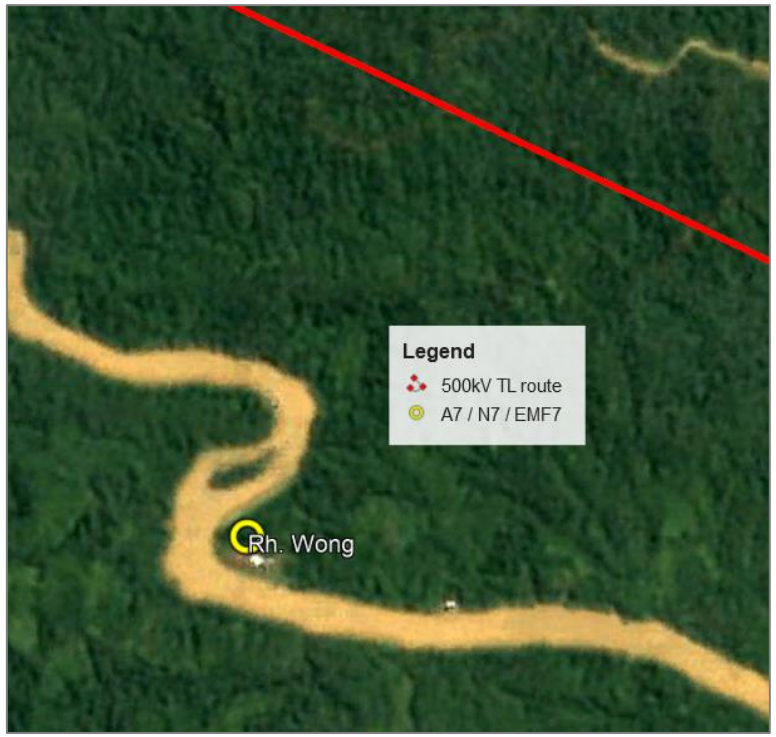


Source: Google Earth, 2021

Plate 5.9.5: Monitoring Station 5 for Air, Noise and EMF – Kapit (town)

Source: Google Earth, 2021

Plate 5.9.6: Monitoring Station 6 for Air, Noise and EMF – Rh. Anting, Batu Bansu



Source: Google Earth, 2021

Plate 5.9.7: Monitoring Station 7 for Air, Noise and EMF – Rh. Wong

Source: Google Earth, 2021

Plate 5.9.8: Monitoring Station 8 for Air, Noise and EMF – Rh. Sana

Source: Google Earth, 2021

Plate 5.9.9: Monitoring Station 9 for Air, Noise and EMF – Rh. Lucas Laso, Nanga Entawau

Source: Google Earth, 2021

Plate 5.9.10: Monitoring Station 10 for Air, Noise and EMF – Putai Camp

5.10 NOISE

5.10.1 Ambient Noise Levels

Baseline measurements of the prevailing noise were carried out at the same locations as the ambient air quality sampling locations (**Figure 5.8.2** and **Plate 5.9.1** to **Plate 5.9.10**). Noise was measured for a duration of one (1) hour each during the day and at night. Measured noise levels for each location are presented in **Table 5.10.1**. The full results are attached in **Appendix 5.10.1**.

The noise levels measured are compared against the levels stated in:

- DOE's Guidelines for Environmental Noise Limits and Control (Third Edition), under First Schedule: Recommended Permissible Sound Level (LA_{EQ}) by Receiving Land Use for New Development: Low Density Residential, Noise Sensitive Receptors, Institutional (School, Hospital, Worship) (**Appendix 5.10.2**).
- WHO Guidelines for Community Noise, 1999 (**Appendix 5.10.3**).

The noise environment at settlements along the transmission line zone of impact is generally influenced by community activities at the settlements; including people and domestic animals, passing boats, vessels, cars, motorcycles and some heavy vehicles, insects especially at night and wind rustling the leaves.

Measured daytime noise levels were generally in the range 45 – 53 dB(A), with a higher level of 61.7 dB(A) recorded at one location (N8-Rh. Sana). The exceedance was mainly attributed to villagers' activities (cutting grasses and wood), noise from cargo vessel, express boat passing by, chirping bird (bird house) and domestic animals.

Measured night time noise levels, were generally in the range of 42 – 49 dB(A), with a higher level of 65.2 dB(A) recorded at N2 (Rh. Richard Nujong), 62.9 dB(A) recorded at N8 (Rh. Sana). At night, the noise was due to active life in the settlements and sounds from generator sets, animals and insects for instance dogs, crickets and cicadas which are more pronounced during night time.

Table 5.10.1: Baseline Noise Measurement Results

Station Date	Coordinates	Location	Category / Distance	Time	L_{EQ}	Guidelines (L_{EQ})			Noise Sources
						DOE	WHO		
N1 1 Dec 20	02° 06'46.12"N 112° 17'20.52"E	SK Nanga Balingiau	School 900 m	Day	51.8	55	55	Not Exceeded	People talking and occasional cars, motorcycles or lorry passing by, domestic animal (cats and dogs) and insects.
				Night	42.3	50	45	Not Exceeded	
N2 2 Dec 20	02° 02'7.46"N 112°25'31.45"E	Rh. Richard Nujong, Nanga Beguang,	Residential 1.7 km	Day	53.7	55	55	Not Exceeded	Boats passing by, house chores, cats and dogs, power generator, wind rustling leaves, insects.
				Night	**65.2**	50	45	**Exceeded (WHO and DOE)**	
N3 3 – 4 Dec 20	02° 0'36.37"N 112° 32'55.04"E	Song	Bazaar 3.3 km	Day	50.0	55	55	Not Exceeded	Cars and motorcycles, working and busy market, domestic animals (cats and dogs) and insects.
				Night	**49.4**	50	45	**Exceeded (WHO)**	
N4 6 Dec 20	02° 01'3.22"N 112° 42'58.28"E	Rh. Bubut Benang, Sg. Ibau	Residential 1.8 km	Day	50.2	55	55	Not Exceeded	People talking, domestic animals (dogs, cats, chicken), occasional boats passing by, insects.
				Night	**48.9**	50	45	**Exceeded (WHO)**	
N5 4 Dec 20	02° 0'59.40"N 112° 56'23.23"E	Kapit	Town 2.8 km	Day	45.1	55	55	Not Exceeded	People doing earthwork, motorcycle and car's passing by, heavy vehicles used, boats nearby and sound of waves, domestic animal (cats and dogs), wind rustling leaves, insects.
				Night	**45.8**	50	45	**Exceeded (WHO)**	
N6 7 Dec 20	02° 01'45.09"N 113° 8'26.93"E	Rh. Anting, Batu Bansu	Residential 480 m	Day	49.1	55	55	Not Exceeded	People talking and working, domestic animal, movement of boats, cars passing by, insects, waves, wind rustling leaves.
				Night	**47.8**	50	45	**Exceeded (WHO)**	
N7 8 Dec 20	01° 58'32.54"N 113° 15'8.18"E	Rh. Wong	Residential 2.2 km	Day	48.8	55	55	Not Exceeded	People talking and working, cats and dogs, boats passing by, waves sound, cars and motorcycle passing by, power generator, nocturnal insects.
				Night	**48.0**	50	45	**Exceeded (WHO)**	

Station Date	Coordinates	Location	Category / Distance	Time	L_{EQ}	Guidelines (L_{EQ})			Noise Sources
						DOE	WHO		
N8 18 Aug 20	01°53'5.12"N 113° 27'12.44"E	Rh. Sana, Nanga Staba	Residential 700 m	Day	**61.7**	55	55	**Exceeded (WHO and DOE)**	People cutting grasses and wood, cargo vessel movement, express boat passing by, chirping bird (bird house) power generator, nocturnal insects.
				Night	**62.9**	50	45	**Exceeded (WHO and DOE)**	
N9 17 Aug 20	01°49'18.43"N 113° 40'46.22"E	Rh. Lucas Laso, Nanga Entawau	Residential 950 m	Day	47.2	55	55	Not Exceeded	Earthwork activities, boats occasional boats passing and stopping, power generator, nocturnal insects, dogs barking, waves, wind rustling leaves.
				Night	**52.1**	50	45	**Exceeded (WHO and DOE)**	
N10 16 Dec 20	01° 48'39.67"N 113° 45'31.14"E	Putai Camp	Residential 835 m	Day	52.4	55	55	Not Exceeded	People talking and working, boats, heavy vehicles, cars and motorcycles, wind rustling leaves, nocturnal insects.
				Night	**57.2**	50	45	**Exceeded (WHO and DOE)**	

** First Schedule, DOE's Guidelines for Environmental Noise Limits and Control, 2019 (Low Density Residential, Noise Sensitive Receptors, Institutional (School, Hospital, Worship))*

*** WHO Guidelines for Community Noise, 1999 (Outdoor Living Area)*

5.11 ELECTROMAGNETIC FIELD (EMF)

5.11.1 EMF Monitoring

EMF was monitored in the existing environment to provide the background EMF levels before the Project. Baseline measurements of the EMF were carried out at the same locations as the ambient air quality sampling locations (**Figure 5.8.2** and **Plate 5.9.1** to **Plate 5.9.10**). These locations were selected due to difficulty to access and determine the exact alignment of the proposed transmission line. At the time of sampling, line survey has not been carried out and the transmission line is yet to be constructed.

As most of the areas along the alignment of the proposed transmission line is undeveloped and a distance away from development, the EMF levels are not expected to be high.

5.11.2 EMF Levels

The measured values were well below the International Commission on Non-Ionizing Radiation Protection's (ICNIRP) Guidelines (see **Table 5.11.1**).

Table 5.11.1: EMF Measured Values

Station	Coordinates	Location	Distance and direction from TL (m)	Magnetic Field (uT)	Magnetic Field - X (uT)	Magnetic Field - Y (uT)	Magnetic Field - Z (uT)	Electric Field (V/m)	RF Strength (mV/m)
EMF1	02° 06'46.12"N 112° 17'20.52"E	SK Nanga Balingiau	900 south	0.00	0.00	0.00	0.00	2.00	54.10
EMF2	02° 02'7.46"N 112°25'31.45"E	Rh. Richard Nujong, Nanga Beguang,	1,700 south	0.00	0.00	0.00	0.00	2.00	308.50
EMF3	02° 0'36.37"N 112° 32'55.04"E	Song	3,300 south	0.01	0.00	0.01	0.00	2.00	176.70
EMF4	02° 01'3.22"N 112° 42'58.28"E	Rh. Bubut Benang, Sg. Ibau	1,800 south	0.00	0.00	0.00	0.00	5.00	50.70
EMF5	02° 0'59.40"N 112° 56'23.23"E	Kapit	2,800 south	0.02	0.00	0.02	0.00	2.00	388.10
EMF6	02° 01'45.09"N 113° 8'26.93"E	Rh. Anting, Batu Bansu	480 south	0.00	0.00	0.00	0.00	2.00	189.50
EMF7	01° 58'32.54"N 113° 15'8.18"E	Rh. Wong	2,200 south	0.00	0.00	0.00	0.00	2.00	140.80
EMF8	01°53'5.12"N 113° 27'12.44"E	Rh. Sana, Nanga Staba	700 south	0.00	0.00	0.00	0.00	2.00	109.10
EMF9	01°49'18.43"N 113° 40'46.22"E	Rh. Lucas Laso, Nanga Entawau	950 south	0.00	0.00	0.00	0.00	2.00	316.90
EMF10	01° 48'39.67"N 113° 45'31.14"E	Putai Camp	835 south	0.00	0.00	0.00	0.00	2.00	292.00
ICNIRP (1998)				**100**				**5000**	

5.12 TRAFFIC CONDITION

The main objective of carrying out a traffic study is to examine the impacts of construction activities of the proposed BMTLP to the existing road network and riverine transportation. The study area is confined to the assessment of traffic and riverine transportations along the transmission line alignment between Baleh 500 kV Substation at Baleh HEP to Mapai 500 kV Substation.

5.12.1 Available Reference

The following references have been used and referred to:

1. REAM – GL 10/2011 – "Guidelines for Traffic Impact Assessment".
2. "1985 Highway Capacity Manual (HCM)" published by Transportation Research Board of National Research Council, Washington D.C.
3. "2000 Highway Capacity Manual (HCM)" published by Transportation Research Board of National Research Council, Washington D.C.

5.12.2 Existing Road Network

Presently, the only local road network to the northern bank of Btg. Rajang is available up to Nanga Tada, near Mapai 500 kV Substation site. Beyond this, there is no direct road linkage except by river transport.

The traffic survey station TS1, which is situated south of the transmission line, is a cross junction. It connects traffic from Sibu and Nanga Tada in the east-west direction (tar-sealed road). It also links traffic to two gravel roads namely Jalan Iran and Jalan Semaram.

Besides TS1 and TS2 (Jalan Melipis), TS3 and TS5 (Jalan Jiwa Murni) are properly constructed tar-sealed roads as well. On the other hand, TS4 is an old logging road currently used by local community (Ulu Sg. Anap) and coal mining company to transport coal to loading terminal at Nanga Tulie. A locality map showing the surrounding road network is depicted in **Figure 5.8.2 (a – d)**.

Plate 5.12.1: Roads near Nanga Tada, Mapai area

Plate 5.12.2: The new road to Kapit, on the southern bank of Btg. Rajang

Plate 5.12.3: TS4, an ex logging road now used by coal mine and community

5.12.3 Future Road Network

It should be noted that there are few road projects near the Project which are set to be implemented (refer to **Figure 5.8.2 (a – d)** for the location of new roads). These projects are:

- Projek Jalan Nanga Kabah / SK Beguang / Sg. Song, Song, Bahagian Kapit, Sarawak (Fasa 1).

  A proposed new two-lane single carriageway with total length of approximately 16 km commences from the existing Jalan Samaram, near Rh. Greman Ujang. It will branch off from Jalan Nibong Tada, and traverses in the south-east direction along northern bank of Btg. Rajang. It is designed to JKR Rural Road R3 design standard.

- Proposed Jalan Nanga Ibau / Ulu Sungai Ibau, Kapit Division, Sarawak.

  A new R1 standard road that will commence from the river mouth of Sg. Ibau which is a tributary of Btg. Rajang, and will end at Ulu Sg. Ibau. The total length is approximately 10 km.

- Proposed Jalan Nanga Menuan / Nanga Setepus, Kapit Division, Sarawak.

  A new road proposed to provide a direct link road to connect the various longhouses and schools along Sg. Menuan. It is a JKR R3 standard main road and the total length of road is approximately 14 km.

- Proposed New Road from Baleh Bridge / Rh. Belaja, Nanga Benin / SK. Nanga Pelagus / Pelagus Resort.

  A new R1 standard road is proposed from the end of existing logging road leading to Sg. Baleh and linked to existing Baleh Bridge near Nanga Mujong to Pelagus Resort. The total length of the new road is approximately 20 km that will serve 10 longhouses nearby to the project site.

5.12.4 Traffic Survey

5.12.4.1 Land Traffic

Land traffic survey at TS1 to TS5 was carried out on the following dates as tabulated in **Table 5.12.1.**

Table 5.12.1: Survey Dates and Period (Land Traffic)

Location	Weekday	Weekend	Survey Period	
TS1	4th Dec 2020	5th Dec 2020	AM	6.30am to 8.30am
TS2	21st Dec 2020	20th Dec 2020		
TS3	18th Dec 2020	19th Dec 2020	Noon	11.30am to 1.30pm
TS4	21st Dec 2020	27th Dec 2020	PM	4.30pm to 6.30pm
TS5	21st Dec 2020	20th Dec 2020		

The traffic data were recorded at 15-minute interval under six (6) different vehicle categories namely passenger car/4-wheel drive, motorcycle, van/utility, light truck, heavy truck and bus. The peak hour traffic volumes in vehicles per hour (VPH) have been computed and the directional traffic flows are presented in **Figure 5.12.1**.

The number of various classes of vehicles have been converted to passenger car unit (PCU) based upon the conversion factors (in **Table 5.12.2**) as recommended in ***Ref. No.1*** in **Section 5.12.1** above. The traffic volumes in VPH have been converted to passenger cars per hour (PCPH for Rural Road) as shown in **Figure 5.12.2**.

Table 5.12.2: Conversion Factors to Passenger Car Unit (PCU)

Type of Vehicle	Rural Road
Passenger Car/4-Wheel Drive	1.00
Motorcycle	1.00
Van/Utility	2.00
Light Truck	2.50
Bus	3.00
Heavy Truck	3.00

The peak hour at the surveyed road occurred at the following peak hours as tabulated in **Table 5.12.3**.

Table 5.12.3: Peak Hour at Different Survey Locations

Location	Weekday			Weekend		
	AM	Noon	PM	AM	Noon	PM
TS1	6.30am to 7.30am	11.30am to 12.30pm	4.30pm to 5.30pm	7.30am to 8.30am	11.30am to 12.30pm	4.30pm to 5.30pm
TS2	6.30am to 7.30am	11.30am to 12.30pm	4.30pm to 5.30pm	7.00am to 8.00am	11.30am to 12.30pm	4.30pm to 5.30pm
TS3	6.45am to 7.45am	11.30am to 12.30pm	4.30pm to 5.30pm	6.45am to 7.45am	11.30am to 12.30pm	4.45pm to 5.45pm
TS4	6.30am to 7.30am	11.30am to 12.30pm	4.45pm to 5.45pm	6.30am to 7.30am	12.30pm to 1.30pm	4.30pm to 5.30pm
TS5	6.30am to 7.30am	11.30am to 12.30pm	4.30pm to 5.30pm	6.30am to 7.30am	11.30am to 12.30pm	4.45pm to 5.45pm

In general, heavy vehicles (trucks and buses) made up about 2% to 25% of the total traffic at the survey locations except TS4. TS4 recorded high percentage of heavy vehicles ranging from 36% to 97%.

Figure 5.12.1: Existing Peak Hour Traffic Volume in Year 2020 – VPH

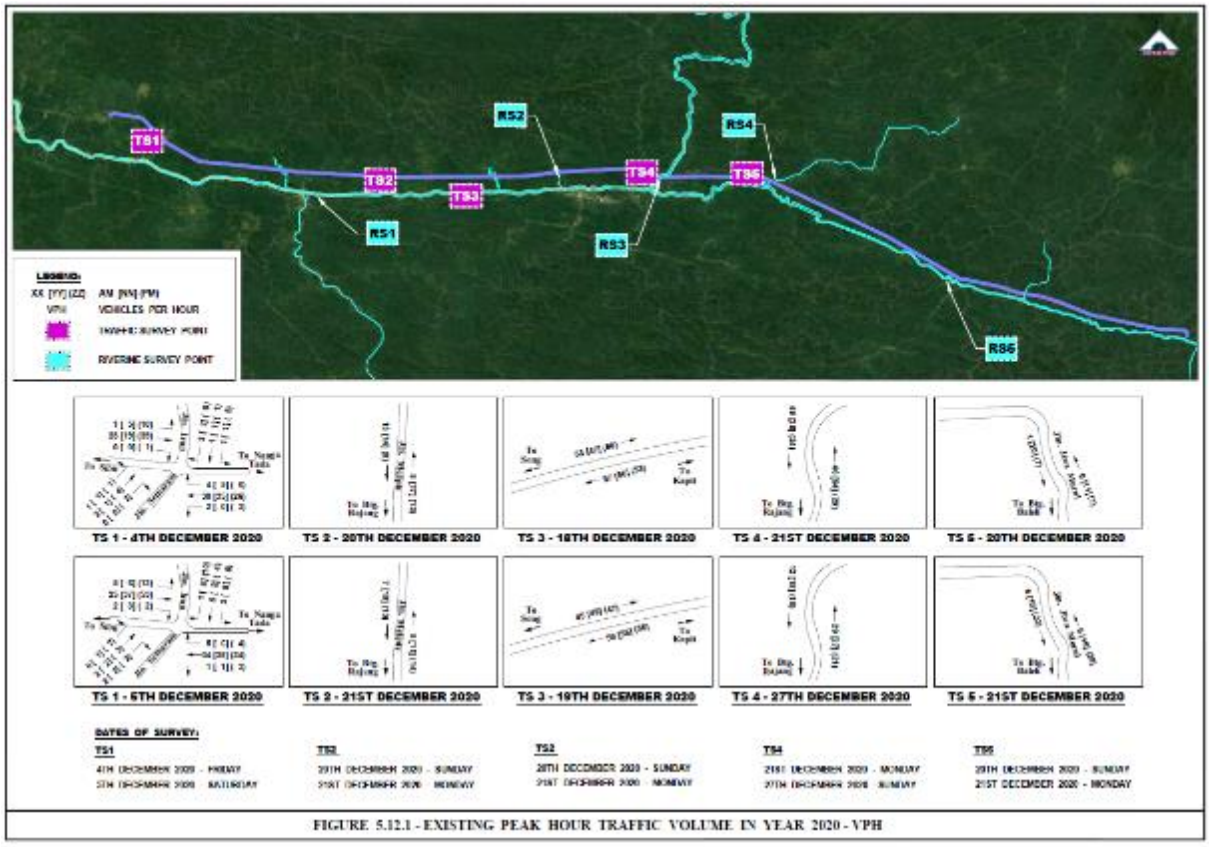


FIGURE 5.12.1 - EXISTING PEAK HOUR TRAFFIC VOLUME IN YEAR 2020 - VPH

For reference only – to be attached in email (A3 size)

Figure 5.12.2: Existing Peak Hour Traffic Volume in Year 2020 – PCPH

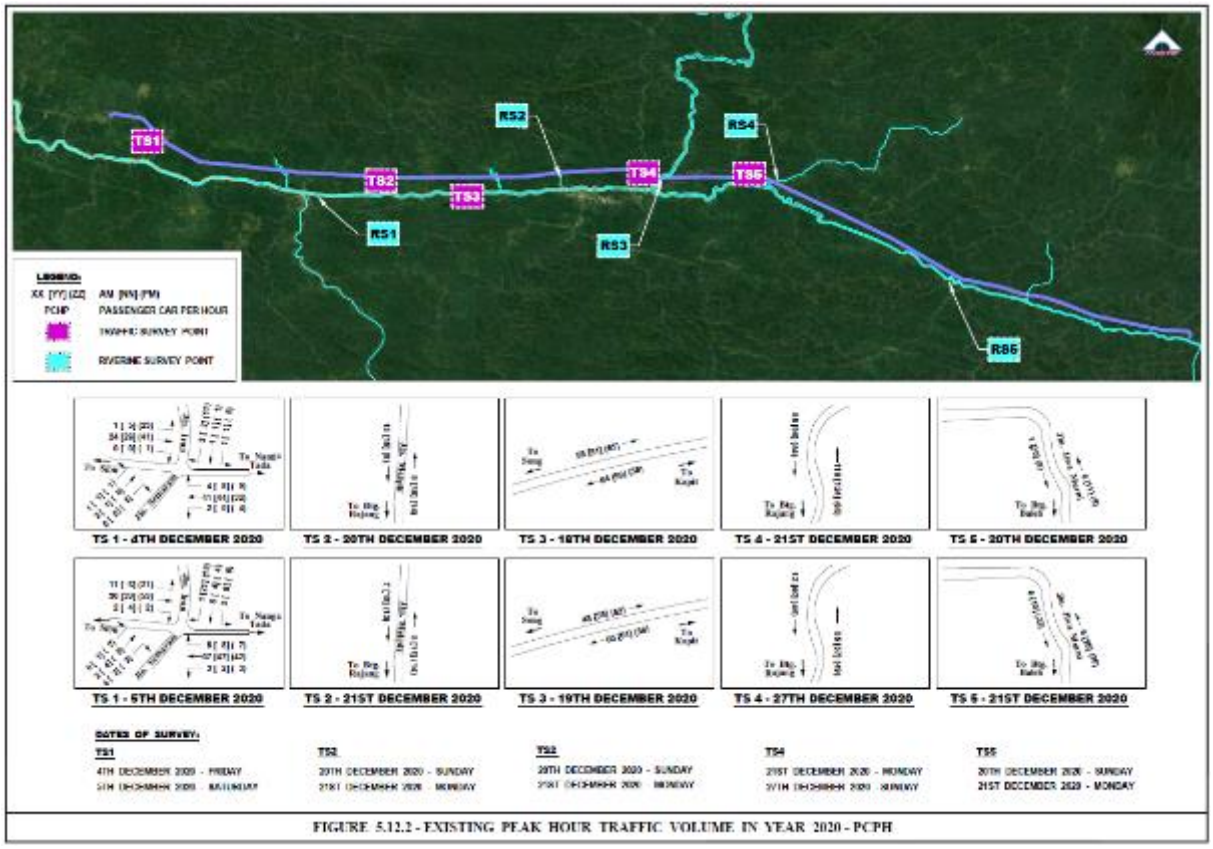


FIGURE 5.12.2 - EXISTING PEAK HOUR TRAFFIC VOLUME IN YEAR 2020 - PCPH

5.12.4.2 Riverine Traffic

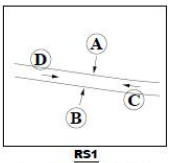
Riverine traffic survey at RS1 to RS5 was carried out from 6.00am to 6.00pm (12-hours survey) on the following dates as tabulated in **Table 5.12.4**.

Table 5.12.4: Survey Dates and Period (Riverine Traffic)

Location	Weekday	Weekend
RS1	7th Dec 2020	6th Dec 2020
RS2	24th Dec 2020	27th Dec 2020
RS3	28th Dec 2020	27th Dec 2020
RS4	21st Dec 2020	20th Dec 2020
RS5	22nd Dec 2020	19th Dec 2020

Figure 5.12.3 below show the number and the movements of vessels plying at different riverine survey locations. **Figure 5.12.4** to **Figure 5.12.8** summarise the total number of different types of vessels at each location on hourly basis.

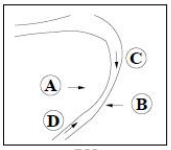
Figure 5.12.3: Existing 12-Hour Riverine Traffic Volume in Year 2020



RS1

Survey Date	Origin	Destination				
		A	B	C	D	Total
6th Dec 2020 (Sunday)	A	-	8	2	-	10
	B	3	-	23	-	26
	C	2	40	-	13	55
	D	-	1	10	-	11
	Total	5	49	35	13	102

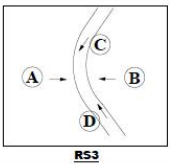
Survey Date	Origin	Destination				
		A	B	C	D	Total
7th Dec 2020 (Monday)	A	-	-	-	-	-
	B	2	-	29	-	31
	C	3	20	-	11	34
	D	-	-	9	-	9
	Total	5	20	38	11	74



RS2

Survey Date	Origin	Destination				
		A	B	C	D	Total
24th Dec 2020 (Thurday)	A	-	-	-	-	-
	B	-	-	-	-	-
	C	-	-	-	19	19
	D	-	-	12	-	12
	Total	-	-	12	19	31

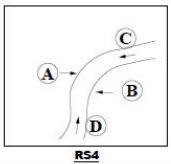
Survey Date	Origin	Destination				
		A	B	C	D	Total
27th Dec 2020 (Sunday)	A	-	-	-	-	-
	B	-	-	-	-	-
	C	-	-	-	15	15
	D	-	-	8	-	8
	Total	-	-	5	15	23



RS3

Survey Date	Origin	Destination				
		A	B	C	D	Total
27th Dec 2020 (Sunday)	A	-	-	-	-	-
	B	-	-	-	-	-
	C	-	-	-	72	72
	D	-	-	43	-	43
	Total	-	-	43	72	115

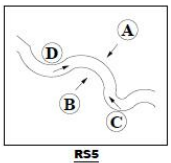
Survey Date	Origin	Destination				
		A	B	C	D	Total
28th Dec 2020 (Monday)	A	-	-	-	-	-
	B	-	-	-	-	-
	C	-	-	-	77	77
	D	-	-	70	-	70
	Total	-	-	70	77	147



RS4

Survey Date	Origin	Destination				
		A	B	C	D	Total
20th Dec 2020 (Sunday)	A	-	-	-	-	-
	B	-	-	-	-	-
	C	-	-	-	7	7
	D	-	1	4	1	6
	Total	-	1	4	8	13

Survey Date	Origin	Destination				
		A	B	C	D	Total
21st Dec 2020 (Monday)	A	-	2	1	-	3
	B	1	-	-	-	1
	C	-	1	-	13	14
	D	3	3	15	-	21
	Total	4	6	16	13	39



RS5

Survey Date	Origin	Destination				
		A	B	C	D	Total
19th Dec 2020 (Saturday)	A	-	-	4	2	6
	B	-	-	-	-	-
	C	1	-	-	15	16
	D	4	-	13	-	17
	Total	5	-	17	17	39

Survey Date	Origin	Destination				
		A	B	C	D	Total
22nd Dec 2020 (Tuesday)	A	-	-	-	2	2
	B	-	-	-	-	-
	C	-	-	-	13	13
	D	-	1	16	-	17
	Total	-	1	16	15	32

FIGURE 5.12.3 - EXISTING 12-HOUR RIVERINE TRAFFIC VOLUME IN YEAR 2020

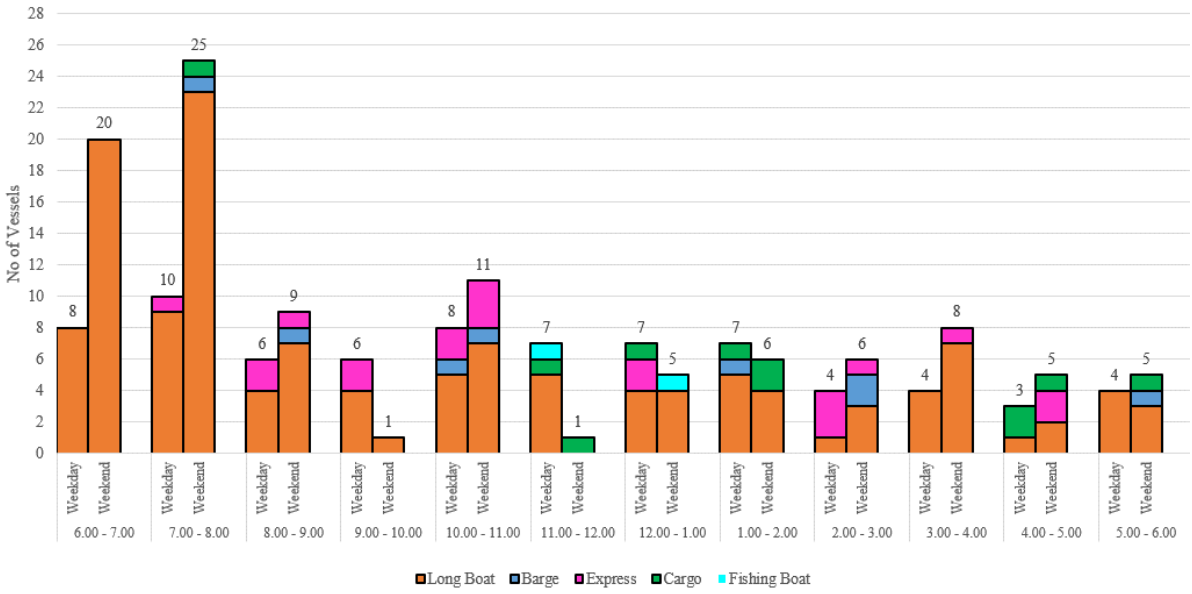


Figure 5.12.4: Type and Number of Vessel at RS1

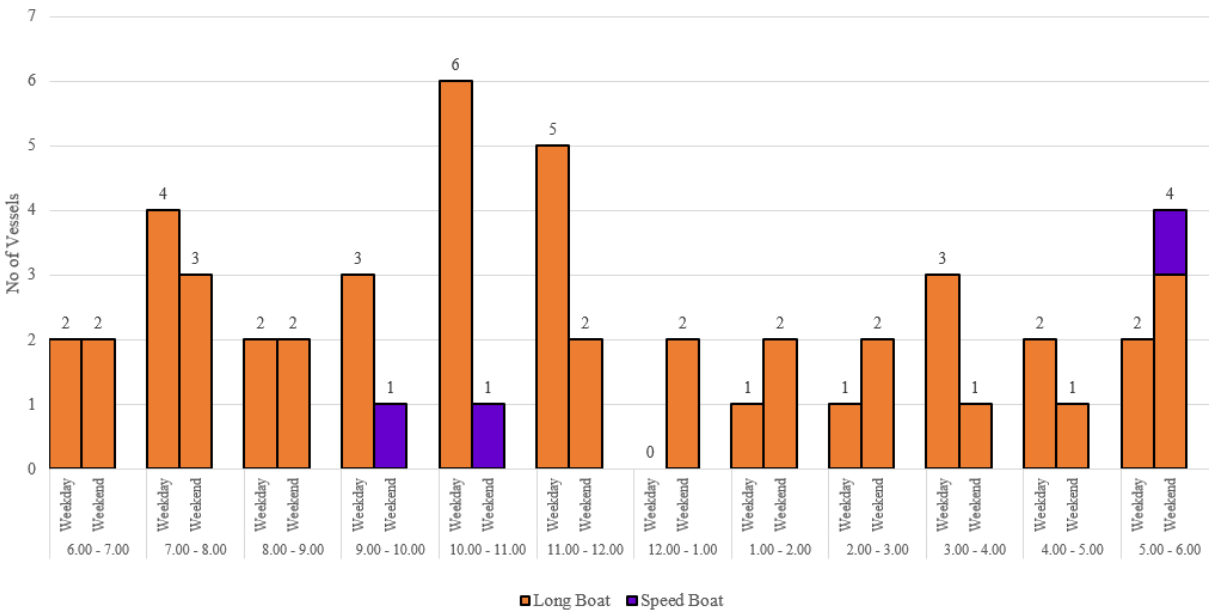


Figure 5.12.5: Type and Number of Vessel at RS2

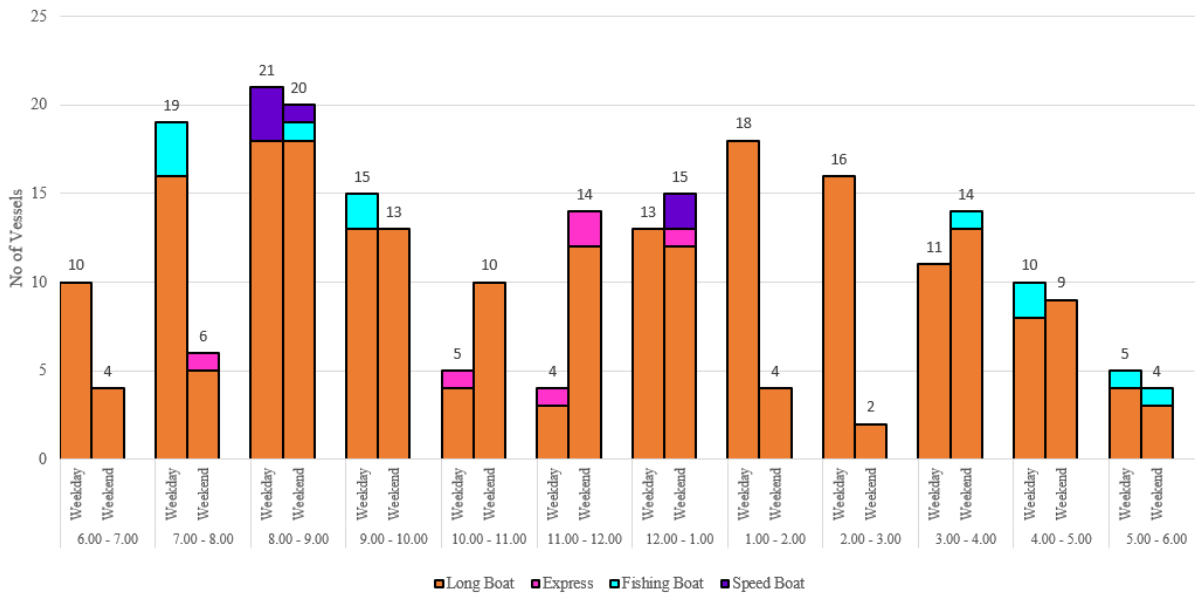


Figure 5.12.6: Type and Number of Vessel at RS3

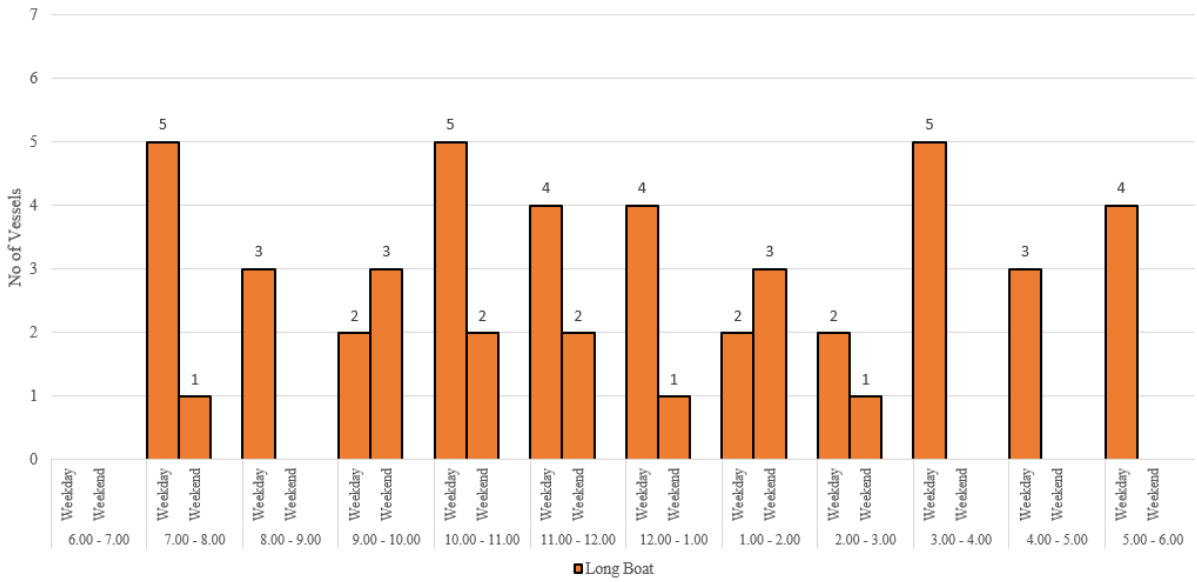


Figure 5.12.7: Type and Number of Vessel at RS4

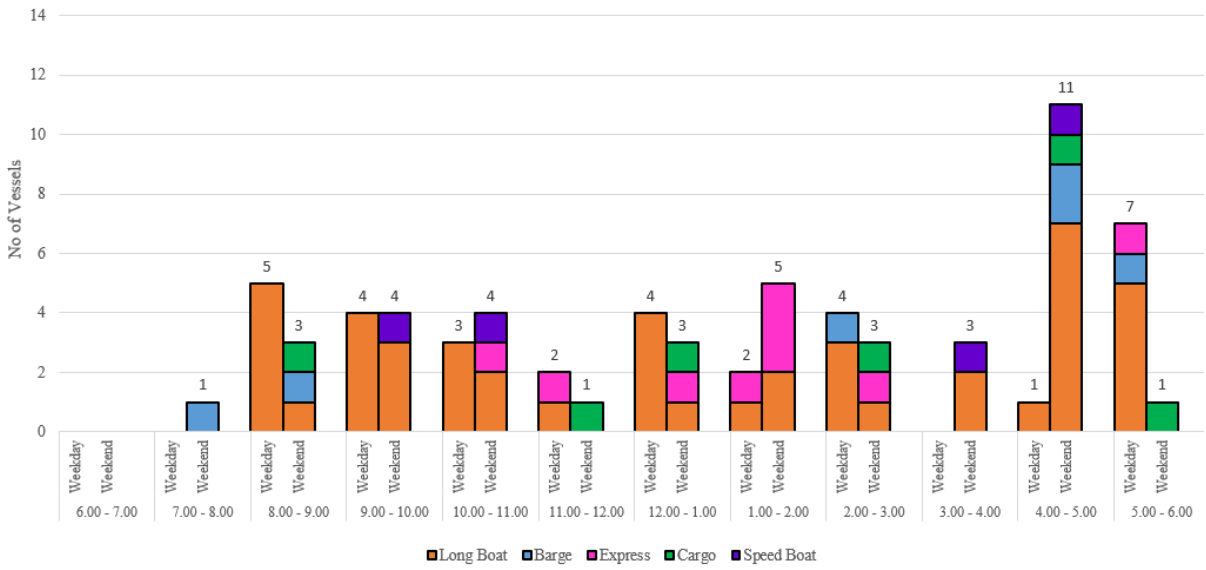


Figure 5.12.8: Type and Number of Vessel at RS5

From these graphs, it can be seen that vessels are mostly consist of "long boat" with the purpose of transporting passengers. Besides "long boat", "speed boats" and "express" could be seen plying at RS1, RS2, RS3 and RS5.

There are less than 20 "barges" and "cargos" found plying at RS1 and RS5 transporting machinery, sand and fuel.

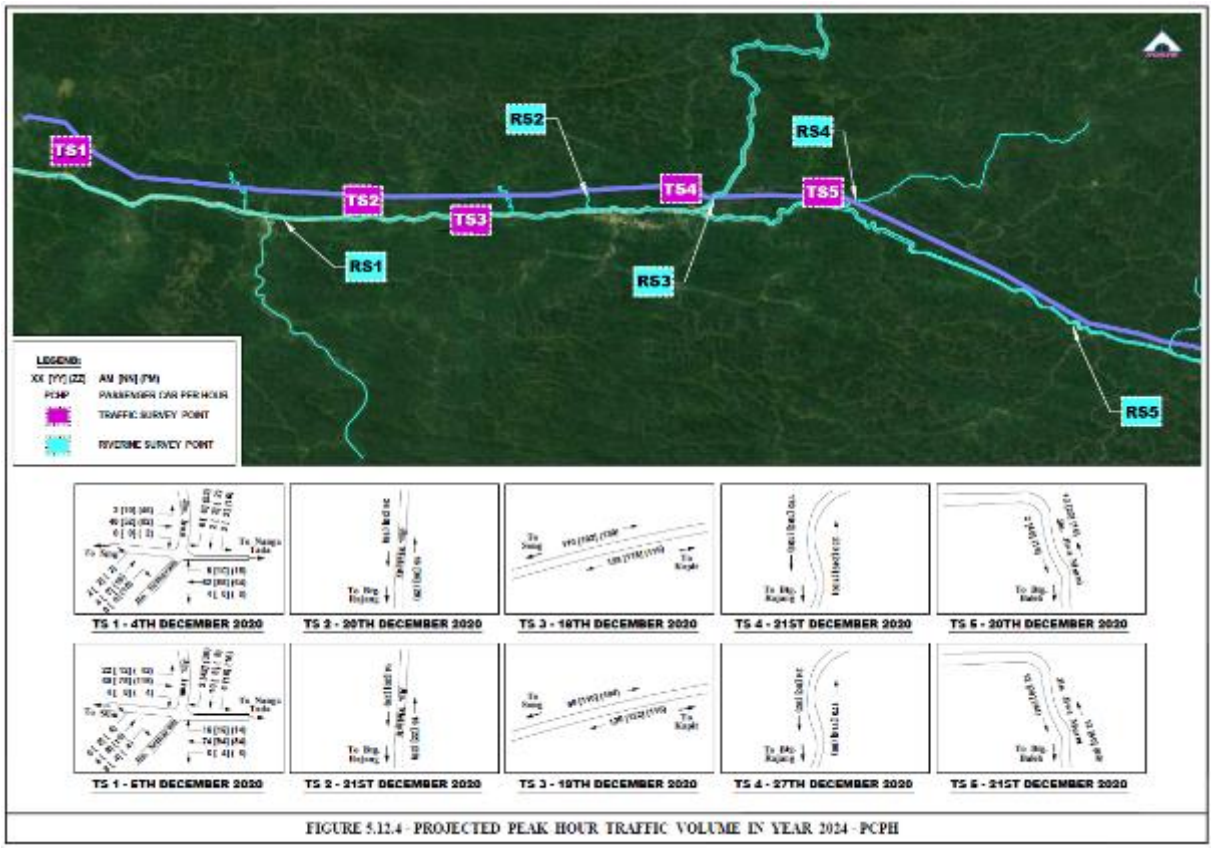
RS1 and RS3 are recorded to have the highest vessel movements.

5.12.5 Projected Future Traffic

Year 2019 Road Traffic Volume Malaysia which is published by Ministry of Works Malaysia shows that the annual growth rate for Traffic Census Station SR301 (Durin Ferry – Junction to Sibu) shows an average annual growth of 18.94%.

Hence for this study, an average growth of 19% is adopted for traffic projection up to Year 2024. The projected peak hour traffic volume in terms of PCPH (Rural Road) at TS1 to TS5 are as shown in **Figure 5.12.9**.

Figure 5.12.9: Projected Peak Hour Traffic Volume in Year 2024 – PCPH (1/2)



For reference only – to be attached in email (A3 size)

5.12.6 Roadway Capacity Analysis

Capacity analysis has been carried out based on the procedures as described in ***Ref. No. 2*** and **3** in **Section 5.12.1** above.

Capacity of road is analysed using the level-of-service (LOS) criteria by computing the volume-to-capacity (V/C) ratio of the studied road segment. As a general guide, the maximum V/C ratio shall not be greater than 0.90 for primary road.

The maximum service flow rate can be computed using the following Equation (1):

$$SF = c \times (v/c) \times f_w \times f_d \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

where:

SF = total service flow rate (pcph) in both directions for prevailing roadway and traffic conditions;

(v/c) = ratio of flow rate to ideal capacity;

f_w = adjustment factor for narrow lanes and restricted shoulder width;

f_d = adjustment factor for directional distribution of traffic

Based on Equation (1) above, the maximum service flow rates (SF) for two directions can be computed as follows:

$$SF = 2{,}800 \times 0.78 \times 0.75 \times f_d = 1{,}638 \times f_d \text{ (tar-sealed road)}$$

$$SF = 2{,}800 \times 0.47 \times 0.66 \times f_d = 869 \times f_d \text{ (gravel road)}$$

The results of the roadway capacity analysis based on the existing and future traffic demands during the peak hours are tabulated in **Table 5.12.5**. It is found that all the roads are operating with minimal V/C up to Year 2024.

Table 5.12.5: Summary of Two-Lane Roadway Capacity Analysis (1/3)

Survey Date	Year	Peak	f_d	SF(C)	NB (pcph)		SB (pcph)		Peak Hour Factor	V* (pcph)	V*/C
TS1 (North of Junction – Gravel Road)											
4th Dec 2020 (Weekday)	2020	AM	0.95	826	7	58%	5	42%	0.75	16	0.02
		Noon	0.87	756	14	74%	5	26%		25	0.03
		PM	0.89	773	39	70%	17	30%		75	0.10
	2024	AM	0.95	826	14	58%	10	42%	0.80	30	0.04

Survey Date	Year	Peak	f_d	SF(C)	NB (pcph)		SB (pcph)		Peak Hour Factor	V* (pcph)	V*/C
		Noon	0.87	756	28	74%	10	26%		48	0.06
		PM	0.89	773	80	70%	34	30%		143	0.18
5th Dec 2020 (Weekend)	2020	AM	0.89	773	21	70%	9	30%	0.75	40	0.05
		Noon	0.92	799	18	35%	33	65%		68	0.09
		PM	0.99	860	33	52%	31	48%		85	0.10
	2024	AM	0.89	773	42	70%	18	30%	0.80	75	0.10
		Noon	0.92	799	36	35%	66	35%		128	0.16
		PM	0.99	860	66	52%	62	48%		160	0.19
TS2 (Tar-sealed Road)											
20th Dec 2020 (Weekend)	2020	AM	0.93	1,523	8	38%	13	62%	0.80	26	0.02
		Noon	0.97	1,589	18	55%	15	45%		41	0.03
		PM	0.92	1,507	14	64%	8	36%		28	0.02
	2024	AM	0.93	1,523	16	38%	26	62%	0.85	49	0.03
		Noon	0.97	1,589	36	55%	30	45%		78	0.05
		PM	0.92	1,507	28	64%	16	36%		52	0.03
21st Dec 2020 (Weekday)	2020	AM	0.98	1,605	8	53%	7	47%	0.80	19	0.01
		Noon	0.99	1,622	11	52%	10	48%		26	0.02
		PM	0.99	1,622	14	52%	13	48%		34	0.02
	2024	AM	0.98	1,605	16	53%	14	47%	0.85	35	0.02
		Noon	0.99	1,622	22	52%	20	48%		49	0.03
		PM	0.99	1,622	28	52%	26	48%		64	0.04
TS3 (Tar-sealed Road)											
18th Dec 2020 (Weekday)	2020	AM	0.98	1,605	64	54%	55	46%	0.85	140	0.09
		Noon	0.98	1,605	59	54%	51	46%		129	0.08
		PM	0.98	1,605	58	47%	65	53%		145	0.10
	2024	AM	0.98	1,605	128	54%	110	46%	0.90	264	0.17
		Noon	0.98	1,605	118	54%	102	46%		244	0.15
		PM	0.98	1,605	116	47%	130	53%		273	0.18
19th Dec 2020 (Weekend)	2020	AM	0.96	1,572	60	57%	45	43%	0.85	124	0.08
		Noon	0.98	1,605	61	53%	55	47%		136	0.08
		PM	0.98	1,605	58	53%	52	47%		129	0.08
	2024	AM	0.96	1,572	120	57%	90	43%	0.90	233	0.15
		Noon	0.98	1,605	122	53%	110	47%		258	0.16
		PM	0.98	1,605	116	53%	104	47%		244	0.15
TS4 (Gravel Road)											
21st Dec 2020	2020	AM	0.95	826	116	58%	85	42%	0.70	287	0.35

Survey Date	Year	Peak	f_d	SF(C)	NB (pcph)		SB (pcph)		Peak Hour Factor	V* (pcph)	V*/C
(Weekday)		Noon	0.96	834	124	56%	96	44%		314	0.38
		PM	0.97	843	65	55%	54	45%		170	0.20
	2024	AM	0.95	826	233	58%	170	42%	0.75	537	0.65
		Noon	0.96	834	249	56%	193	44%		589	0.71
		PM	0.97	843	130	55%	108	45%		317	0.38
27th Dec 2020 (Weekend)	2020	AM	0.77	669	85	88%	12	12%	0.75	129	0.19
		Noon	0.95	826	57	59%	40	41%		129	0.16
		PM	0.99	860	49	52%	46	48%		127	0.15
	2024	AM	0.77	669	170	88%	24	12%	0.80	243	0.36
		Noon	0.95	826	114	59%	80	41%		243	0.29
		PM	0.99	860	98	52%	92	48%		238	0.28
TS5 (Tar-sealed Road)											
20th Dec 2020 (Weekend)	2020	AM	0.78	1,278	6	86%	1	14%	0.50	13	0.01
		Noon	0.92	1,507	11	35%	20	65%		56	0.04
		PM	1.00	1,638	8	50%	8	50%		29	0.02
	2024	AM	0.78	1,278	12	86%	2	14%	0.65	23	0.02
		Noon	0.92	1,507	22	35%	40	65%		104	0.07
		PM	1.00	1,638	16	50%	16	50%		53	0.03
21st Dec 2020 (Weekday)	2020	AM	1.00	1,638	6	50%	6	50%	0.50	24	0.01
		Noon	0.91	1,491	20	67%	10	33%		60	0.04
		PM	0.95	1,556	30	58%	22	42%		104	0.07
	2024	AM	1.00	1,638	12	50%	12	50%	0.55	44	0.03
		Noon	0.91	1,491	40	67%	20	33%		109	0.07
		PM	0.95	1,556	60	58%	44	42%		189	0.12

pcph- passenger cars per hour
NB - northbound
SB – Southbound
V - total 2-direction volume with peak hour factor*
V/C - volume-to-capacity ratio

5.13 WASTE MANAGEMENT

5.13.1 Waste Facility

In Sarawak, municipal solid waste management falls under the jurisdiction of Local Authority under the Local Authority (Cleanliness) By-Laws 1999. According to the NREB Sarawak, there are 46 landfills in Sarawak of which only five (5) are sanitary landfills and the other 41 open landfills. The existing landfills in the region are shown in **Table 5.13.1**.

Table 5.13.1: List of Operating Landfills in the Project Region

Division	District/Sub-District	Landfill	Area of Collection
Sibu	Sibu	Seng Ling	Sibu
		Kemuyang	
	Kanowit	Kanowit	Kanowit, Mashan
	Sibu rural	Selangau	Selangau bazaar, Tepus, Arip
		Stapang	Sekuau, Stapang, Tamin
Kapit	Kapit	Kapit	Kapit
	Belaga	Belaga	Belaga
		Sungai Asap	Sungai Asap
	Song	Song	Song

Only the Kemuyang Landfill is a sanitary landfill equipped with wastewater treatment facilities to treat leachate. The Seng Ling Landfill is dedicated to receiving bulky wastes including construction wastes.

Municipal operated dumpsites are available in Kapit and Song, on the southern bank of Btg. Rajang, but waste collection coverage is relatively low due to accessibility difficulty. The Project site and its surrounding communities are located in remote areas on the northern bank of Btg. Rajang and Btg. Baleh, which are not readily accessible by roads. Even if there is road, the road condition may not permit the access of collection vehicles.

The form of municipal solid waste disposal for the communities around the Project site is commonly burial, dumping into the river or burning.

Figure 5.13.1: Kapit Dumpsite, approximately 4 km south of Kapit Town

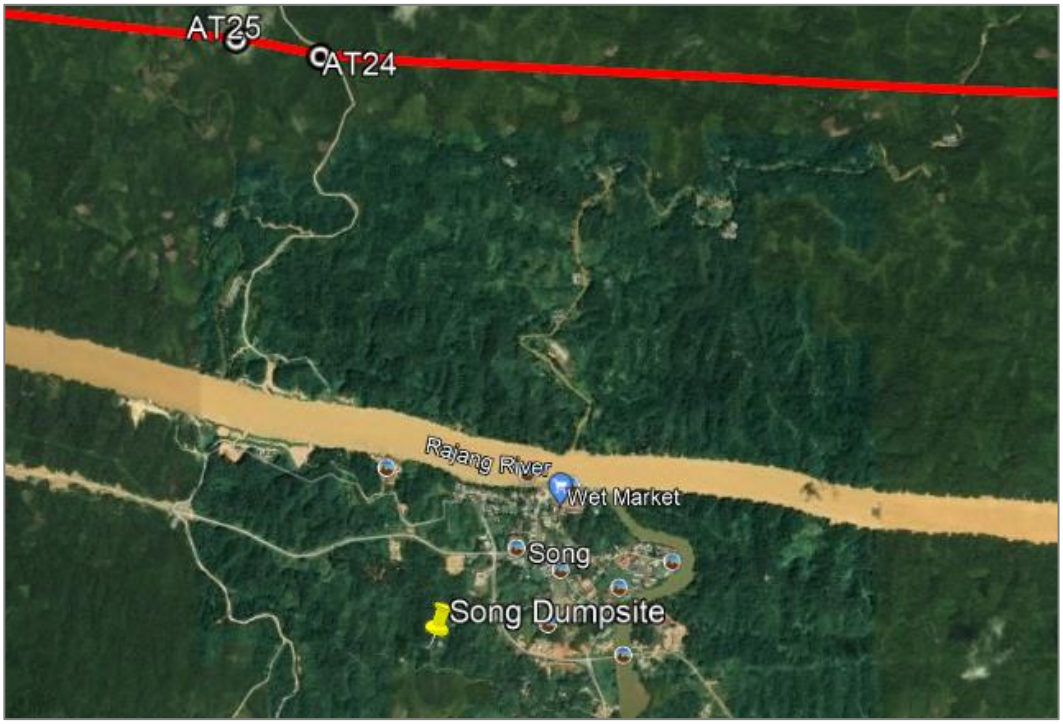


Figure 5.13.2: Song Dumpsite, approximately 1.5 km south of Song Town

In terms of scheduled wastes management, the Kuching Integrated Waste Management Park (KIWMP) is the only facility in the State designated to treat and manage scheduled wastes. As an alternative to disposal at KIWMP, there are offsite scheduled wastes storage facilities within the region to which the

Proponent can send their scheduled wastes to, if relevant. The list of DOE licensed offsite scheduled wastes storage facilities is tabulated in **Table 5.13.2**.

Currently, there are no recycling facilities in the Kapit Division. Recycling facilities for construction wastes such as scrap metals and/or plastics is only available in Sibu Town[3]. The list of recycling facilities in Sibu is shown in **Table 5.13.3**; however, this is not an exhaustive list.

Table 5.13.2: List of DOE Licensed Offsite Scheduled Wastes Storage Facilities in the Project Region

No.	Name and Address	Waste Code	Waste Group
1.	Kien San Metal (Sibu) Sdn Bhd Lot 1448 & 4330, Jalan Lanang Barat, 96000	SW102	Waste of lead acid batteries in whole or crushed form
		SW305	Spent lubricating oil
		SW306	Spent hydraulic oil
2.	TLM Tiasa Hijau Sdn Bhd No. 35, Lot 1208, Sibu Light Industrial Park, 96007	SW305	Spent lubricating oil
		SW306	Spent hydraulic oil
		SW307	Spent mineral oil-water emulsion
		SW409	Disposed containers, bags or equipment contaminated with chemicals, pesticides, mineral oil or scheduled wastes
		SW410	Rags, plastics, papers or filters contaminated with scheduled wastes

Table 5.13.3: List of Recycling Facilities in the Project Region

No.	Name and Address	Recycled Wastes
1.	Tzu-Chi Recycling Centre Sibu Lorong Rejang Park 14, Pekan Sibu, 96000 Sibu, Sarawak	Scrap metal, plastic, paper
2.	Zhau Hau International Sdn Bhd Lorong Sukun 26, Teng Kung Suk 3, 96000 Sibu, Sarawak	Scrap metal, plastic, paper
3.	Satong Plastic Recycle	Plastic

[3] Sibu is approximately 64 km or an hour drive from Mapai Substation.

No.	Name and Address	Recycled Wastes
	No. 55B, First Floor, Lanang Road, 96000 Sibu, Sarawak	
4.	Chiong Hing Recycle Lorong Lada 14A, Teng Kung Suk 3, 96000 Sibu, Sarawak	Scrap metal, plastic, paper
5.	Chan Recycle & Trading 13A, 1st Floor, Lorong Ding Lik Kong, 96000 Sibu, Sarawak	Scrap metal, plastic, paper
6.	Tung Seng Enterprise Sdn Bhd Lot 1058 & 1060, Jalan Tunku Abang Rahman, 96000 Sibu, Sarawak	Scrap metal, plastic, paper
7.	Chuong Hin Trading Co. Lot 560, Jalan Igan, 96000 Sibu, Sarawak	Scrap metal, paper
8.	Public Metals Enterprise No. 26-B, Jalan Lanag, 96000 Sibu, Sarawak	Scrap metal
9.	Kien SN Metal Sdn Bhd Lot 484, Lorong 4, jalan Then Kung Suk, 96000 Sibu, Sarawak	Scrap metal
10.	KLS Metal Resources No. 7B, Lorong Wong Ting Hock 2, Lot 1317, Block 2, Sg. Merah Town District, 96000 Sibu, Sarawak	Scrap metal, aluminium, copper, cardboard
11.	Kien San Metal (Sibu) Sdn Bhd No. 12, Lot 1448& 4330, Lorong 4, Jalan Ulu Lanang, 96000 Sibu	Scrap metal
12.	Omni Active Sdn Bhd Jalan Bukit Lima, 96000 Sibu, Sarawak	Scrap metal, cardboard, paper
13.	Eksen Enterprise No. 16, TKT Bawah, Jalan Blacksmith, 96000 Sibu, Sarawak	Scrap metal, plastic, paper
14.	Siong Yek Recycle Centre Pole 6, Jalan Igan Sg. Merah, 96000 Sibu, Sarawak	Scrap metal, plastic, paper
15.	Jason General Trading Lot 158, Block 18, Seduan Land District, 96000 Sibu, Sarawak	Scrap metal, plastic, paper
16.	Siong Hui Enterprise	Scrap metal, plastic, paper

No.	Name and Address	Recycled Wastes
	2-D Jalan Gambir Lorong 7, 96000 Sibu, Sarawak	
17.	Tai Hing Trading No. 14, Lorong Jalan Then Kung Suk, 96000 Sibu, Sarawak	Scrap metal, plastic, paper
18.	KRT Taman Seduan	Scrap metal, plastic, paper
19.	Sibu Kidney Foundation with Sibu Municipal Council 6, Jalan Chong Jin Bock, Pekan Sibu, 96000 Sibu, Sarawak	Scrap metal, plastic, paper

5.13.2 Sewage and Sludge Treatment

In Kapit Division, the main sewerage system is the individual septic tank. Individual septic tank is a simple and low-cost method to primarily treat blackwater (sewage) by means of sedimentation and anaerobic process. The performance of individual septic tank is subject to the quantity of settled solids that accumulate in the tank over time, where it has to be desludged regularly to maintain its treatment efficiency. However, the regular desludging of septic tank is deficient in the rural areas of Kapit due to limited access to desludging trucks and a lack of treatment facility. Thus, the common toilet facility used by the communities surrounding the Project site is either a flush toilet or a pour-flush latrine, depending on the reliability of the household sources of domestic water.

Under the Local Authorities (Compulsory Desludging of Septic Tanks) By-Laws 1998, septic tanks in the local authority area should be properly desludged and serviced after a certain period. The nearest septic sludge treatment plant to the Project site is the Sibu Septic Sludge Treatment Plant, which is located next to the Kemuyang Sanitary Landfill. However, the current practice in Kapit is to dispose the sludge collected from septic tanks in dumpsites.[4]

[4] Source: Sewerage Services Department. https://ssd.sarawak.gov.my/page-0-396-363-Kapit-Septic-Sludge-Treatment-Plant.html

Appendix 5.8.1

Sarawak GFS List (Sibu-Kapit Division)

The following data presented are only of those available from sources such as the District Offices, Jabatan Kesihatan Negeri Sarawak, Jabatan Mineral dan Geosains, and Sarawak Forestry Corporation.

SIBU DIVISION

KANOWIT DISTRICT

	State	District	Kampung
1.	Sarawak	Kanowit	Rh. Muran, Menalun
2.	Sarawak	Kanowit	Rh. Diyan, Ng. Seputan
3.	Sarawak	Kanowit	Rh. Nyaru, Kerangan
4.	Sarawak	Kanowit	Rh. Sait, Kerangan
5.	Sarawak	Kanowit	Rh. Umau, Ng. Sebetong
6.	Sarawak	Kanowit	Rh. Gani, Ng. Apek
7.	Sarawak	Kanowit	Rh. Tarang, Ng. Apek
8.	Sarawak	Kanowit	Rh. Engan, Sg. Menuan
9.	Sarawak	Kanowit	Rh. Gamang, Sg. Menuan
10.	Sarawak	Kanowit	Rh. Balai, Lepong Giam
11.	Sarawak	Kanowit	Rh. Udin/Sangga, Ng. Menuan
12.	Sarawak	Kanowit	Rh. Langit, Ulu Poi
13.	Sarawak	Kanowit	Ch. Sett, Sengayan Hilir
14.	Sarawak	Kanowit	Ch. Sett, Mitam
15.	Sarawak	Kanowit	Rh. Asing, Ng. Lepan
16.	Sarawak	Kanowit	Rh. Encheludu, Ng. Lepan
17.	Sarawak	Kanowit	Rh. Anjat, Ng. Lepan.
18.	Sarawak	Kanowit	Rh. Masam, Ng. Lepan
19.	Sarawak	Kanowit	Rh. Tiong, Bt. Luking
20.	Sarawak	Kanowit	Rh. Arun, Majau
21.	Sarawak	Kanowit	Rh. Laga, Majau
22.	Sarawak	Kanowit	Rh. Surat, Mitam
23.	Sarawak	Kanowit	Rh. Angat, Ng. Lepan
24.	Sarawak	Kanowit	Rh. Lajang, U/Machan
25.	Sarawak	Kanowit	Rh. Engkayau Ulu Machan
26.	Sarawak	Kanowit	Rh. Sandah Ulu Machan
27.	Sarawak	Kanowit	Rh. Sumbang Ulu Machan
28.	Sarawak	Kanowit	Rh. Kayan, Ng. Manggut
29.	Sarawak	Kanowit	Rh. Sandai, Ng. Manggut
30.	Sarawak	Kanowit	Rh. Jampong, Ng. Jerangku
31.	Sarawak	Kanowit	Rh. Petey, Ng. Sepitoh
32.	Sarawak	Kanowit	Rh. Mathew Ulu Latong
33.	Sarawak	Kanowit	Rh. Sandom Ng. Latong
34.	Sarawak	Kanowit	Rh. Amun Ng. Latong
35.	Sarawak	Kanowit	Rh. Bingat, Ng. Machan
36.	Sarawak	Kanowit	Rh. Pawa, Ng. Sengkabang
37.	Sarawak	Kanowit	Rh. Upoi, Ng. Jerangku
38.	Sarawak	Kanowit	RUMAH GLENN ANAK GABRIEL SALAMAT, SPS. NANGA JAGAU, NGEMAH, KANOWIT

39.	Sarawak	Kanowit	RUMAH JIMMY ANAK JARAU, NANGA LAKAH, ULU NGEMAH, KANOWIT
40.	Sarawak	Kanowit	RUMAH MAGAL ANAK TUKAU, LUBOK TANJONG, ULU NGEMAH, KANOWIT
41.	Sarawak	Kanowit	RUMAH SALANG ANAK MANGGAU, RANTAU LUGAI, ULU NGEMAH, KANOWIT
42.	Sarawak	Kanowit	RUMAH AKUN ANAK NYANGGAU, NANGA KABAH, KANOWIT
43.	Sarawak	Kanowit	RUMAH ANJAT ANAK RAMBA, NANGA LEPAN, KANOWIT
44.	Sarawak	Kanowit	RUMAH ARUN ANAK UNCHAT, NANGA BUAN, KANOWIT
45.	Sarawak	Kanowit	RUMAH ASING ANAK KUDANG, NANGA LEPAN, KANOWIT
46.	Sarawak	Kanowit	RUMAH CATHERINE ANAK PINIT, RANTAU DILANG, KANOWIT
47.	Sarawak	Kanowit	RUMAH GALIH ANAK SEMILAN, NANGA ENSENGAI, KANOWIT
48.	Sarawak	Kanowit	RUMAH GERAMAN ANAK BUNDAI, ULU WHO, KANOWIT
49.	Sarawak	Kanowit	RUMAH ISAU ANAK NYANDANG, ULU WHO, KANOWIT
50.	Sarawak	Kanowit	RUMAH JUGAH ANAK ULOH, NANGA WHO, KANOWIT
51.	Sarawak	Kanowit	RUMAH KANTI ANAK BALEN, NANGA BUAN, KANOWIT
52.	Sarawak	Kanowit	RUMAH LIAS ANAK BUNGGOP, NANGA WHO, KANOWIT
53.	Sarawak	Kanowit	RUMAH LINDANG ANAK EMPEDING, PULAU KEMAYAU, KANOWIT
54.	Sarawak	Kanowit	RUMAH MANGGIN ANAK UNGEH, NANGA BUAN, KANOWIT
55.	Sarawak	Kanowit	RUMAH MASAM ANAK KUAH, NANGA LEPAN, KANOWIT
56.	Sarawak	Kanowit	RUMAH MERKA ANAK ENCHARUNDU, NANGA LEPAN, KANOWIT
57.	Sarawak	Kanowit	RUMAH PIUS ANAK KUCHAI, NANGA WHO, KANOWIT

58.	Sarawak	Kanowit	RUMAH SAIT ANAK DIAN, SEBERAI NGEMAH, KANOWIT
59.	Sarawak	Kanowit	RUMAH TEGALAN ANAK SARI, NANGA BUAN, KANOWIT
60.	Sarawak	Kanowit	RUMAH UNTOL ANAK GARENG, NANGA TERUSA, KANOWIT
61.	Sarawak	Kanowit	RANTAU DILANG, KANOWIT
62.	Sarawak	Kanowit	RUMAH ANDIN ANAK NGALANG, SUNGAI BEJAIT, KANOWIT
63.	Sarawak	Kanowit	RUMAH ANDREAS ANAK CHENDANG, NANGA BAWAN, KANOWIT
64.	Sarawak	Kanowit	RUMAH ANTHONY ANAK JOHNNY, BAWAN, KANOWIT
65.	Sarawak	Kanowit	RUMAH ANTHONY IKUS ANAK BAKOM, NANGA PEDAI, KANOWIT
66.	Sarawak	Kanowit	RUMAH BALI ANAK ASOM, NANGA BAWAN, KANOWIT
67.	Sarawak	Kanowit	RUMAH BARNABAS ANAK BANYAN, NANGA TUAH, KANOWIT
68.	Sarawak	Kanowit	RUMAH BASIL ANAK UJANG, NANGA PEDAI, KANOWIT
69.	Sarawak	Kanowit	RUMAH BLALANG ANAK ENTALAI, NANGA BAWAN, KANOWIT
70.	Sarawak	Kanowit	RUMAH BONIFACE ANAK VINCENT, SUNGAI TUAH, KANOWIT
71.	Sarawak	Kanowit	RUMAH DANDI ANAK ENSALI, SUNGAI JIH, KANOWIT
72.	Sarawak	Kanowit	RUMAH DANG ANAK ENJAT, NANGA BOB, KANOWIT

KAPIT DIVISION

KAPIT DISTRICT

	Negeri	Daerah	Kampung
1.	Sarawak	Kapit	Rh. Ngumbang, Sebatu
2.	Sarawak	Kapit	Rh. Kemarau, Entangai
3.	Sarawak	Kapit	Rh. Baja Sg. Entangai
4.	Sarawak	Kapit	Rh. Messop Sg. Entangai
5.	Sarawak	Kapit	Rh. Jampong, Btg. Rajang
6.	Sarawak	Kapit	Rh. Jeffry Nudong
7.	Sarawak	Kapit	Rh. Ungka, Ng. Ibau
8.	Sarawak	Kapit	Rh. Mujah, Ng. Ibau
9.	Sarawak	Kapit	Rh. Bubut, Sg. Ibau
10.	Sarawak	Kapit	Rh. Uho, Sg. Ibau
11.	Sarawak	Kapit	Rh. Lemada, Sg. Ibau
12.	Sarawak	Kapit	Rh. Mengga, Sg. Ibau
13.	Sarawak	Kapit	Rh. Gerinsa, Sg. Ibau
14.	Sarawak	Kapit	Rh. Langan, Sg. Ibau
15.	Sarawak	Kapit	Rh. Jubang, Sg. Ibau
16.	Sarawak	Kapit	Rh. Jepai/Sana, Btg. Rajang
17.	Sarawak	Kapit	Rh. Mamat, Btg. Rajang
18.	Sarawak	Kapit	Rh. Jabang, Btg. Rajang
19.	Sarawak	Kapit	Rh. Baring/Ekau, Btg. Rajang
20.	Sarawak	Kapit	Rh. Rangau/Peter, Btg. Rajang
21.	Sarawak	Kapit	Rh. Lugom, Ng. Belawai
22.	Sarawak	Kapit	Rh. Rantai, Ng. Belawai
23.	Sarawak	Kapit	Rh. Nuing, Sg. Belawai
24.	Sarawak	Kapit	Rh. Piuh, Sg. Belawai
25.	Sarawak	Kapit	Rh. Nuga, Sg. Semujan
26.	Sarawak	Kapit	Rh. Rengga, Sg. Semujan
27.	Sarawak	Kapit	Rh. Baying, Sg. Semujan
28.	Sarawak	Kapit	Rh. Kemarau, Sg. Belawai

29.	Sarawak	Kapit	Rh. Gelu, Sg. Belawai
30.	Sarawak	Kapit	Rh. Mamat, Sg. Belawai
31.	Sarawak	Kapit	Rh. Jabang, Sg. Belawai
32.	Sarawak	Kapit	Rh. Madau, Sg. Belawai
33.	Sarawak	Kapit	Rh. Kayan, Sg. Belawai
34.	Sarawak	Kapit	Rh. Seliong, Sg. Belawai
35.	Sarawak	Kapit	Rh. Jamba/Rh Ason, Btg. Rajang
36.	Sarawak	Kapit	Rh. Binal, Ng. Yong
37.	Sarawak	Kapit	Rh. Bangau, Sg. Tisa
38.	Sarawak	Kapit	Rh. George, Sg. Yong
39.	Sarawak	Kapit	Rh. Linggi, Sg. Yong
40.	Sarawak	Kapit	Rh. William Unchat, Batu Bediri, Ulu Sg. Yong
41.	Sarawak	Kapit	Rh. Masam, Sg. Yong
42.	Sarawak	Kapit	Rh. Manok Manchal Lbk Mawang, Sg. Yong
43.	Sarawak	Kapit	Rh. Untang, Sg. Yong
44.	Sarawak	Kapit	Rh. Lapik, Ng. Engkatit
45.	Sarawak	Kapit	Rh. Memaloh, Sg. Yong
46.	Sarawak	Kapit	Rh. Semut, Sg. Yong
47.	Sarawak	Kapit	Rh. Jandok, Ulu Yong
48.	Sarawak	Kapit	Rh. Ngelambong, Bt. Rjg.
49.	Sarawak	Kapit	Rh. Undi, Btg. Rajang
50.	Sarawak	Kapit	Rh. George, Ng. Dia, Bt. Rjng
51.	Sarawak	Kapit	Rh.Pasang, Btg. Rajang
52.	Sarawak	Kapit	Rh. Richard Unggat
53.	Sarawak	Kapit	Rh. Baja Ng. Nyikau / Rh. Tulu
54.	Sarawak	Kapit	Rh. Changgai, Sg. Kapit
55.	Sarawak	Kapit	Rh. John/Meliu, Sg. Sesibau
56.	Sarawak	Kapit	Rh. Ladin/Unjah, Sg. Sesibau
57.	Sarawak	Kapit	Rh. Jinggong, Sg. Sesibau

58.	Sarawak	Kapit	Rh. Engkang, Sg. Sesibau
59.	Sarawak	Kapit	Rh. Nuang, Sg. Kapit
60.	Sarawak	Kapit	Rh. Chambok, Sg. Kapit
61.	Sarawak	Kapit	Rh. Embong, Sg. Kapit
62.	Sarawak	Kapit	Rh. Madang, Sg. Kapit
63.	Sarawak	Kapit	Rh. Bundong, Sg. Kapit
64.	Sarawak	Kapit	Rh. Minggat, Sg. Kapit
65.	Sarawak	Kapit	Rh. Ganya, Sg. Amang
66.	Sarawak	Kapit	Rh. Penghulu, Menuan
67.	Sarawak	Kapit	Rh. Jacob, Menuan
68.	Sarawak	Kapit	Rh. Bigau, Menuan
69.	Sarawak	Kapit	Rh. Latit, Menuan
70.	Sarawak	Kapit	Rh. Garai, Menuan
71.	Sarawak	Kapit	Rh. Mangan, Menuan
72.	Sarawak	Kapit	Rh. Enchana, Menuan
73.	Sarawak	Kapit	Rh. Jengging, Menuan
74.	Sarawak	Kapit	Rh. Mancha, Menuan
75.	Sarawak	Kapit	Rh. Jackson, Menuan
76.	Sarawak	Kapit	Rh. Enkechung, Menuan
77.	Sarawak	Kapit	Rh. Mejang, Menuan
78.	Sarawak	Kapit	Rh. Mering, Menuan
79.	Sarawak	Kapit	Rh. Samat/Mat Sg. Goh
80.	Sarawak	Kapit	Rh. Jane, Sg. Goh
81.	Sarawak	Kapit	Rh. Meleba, Sg. Goh
82.	Sarawak	Kapit	Rh. Sanggau/Dingai Ng. Goh
83.	Sarawak	Kapit	Rh. Uset/Ujoh Ng. Seranau
84.	Sarawak	Kapit	Rh. Janin, Sg. Seranau
85.	Sarawak	Kapit	Rh. Vincent, Serian
86.	Sarawak	Kapit	Rh. Ikau, Btg. Rejang

87.	Sarawak	Kapit	Rh. Lium, Btg. Rejang
88.	Sarawak	Kapit	Rh. Bunyau, Bt. Rejang
89.	Sarawak	Kapit	Rh. Gani, Btg. Rejang
90.	Sarawak	Kapit	Rh. Kendawang, Btg. Rejang
91.	Sarawak	Kapit	Rh. Unan, Brt. Rejang
92.	Sarawak	Kapit	Rh. Gaing/Ng Baleh
93.	Sarawak	Kapit	Rh. Beraoh, Btg. Rejang
94.	Sarawak	Kapit	Rh. Penghulu, Btg. Rejang
95.	Sarawak	Kapit	Rh. Jelani, Btg. Rejang
96.	Sarawak	Kapit	Rh. Bujo, Btg. Rejang
97.	Sarawak	Kapit	Rh. Belikau Pulau Raya Btg. Rajang
98.	Sarawak	Kapit	Rh. Rabar, Btg. Rejang
99.	Sarawak	Kapit	Rh. Jengging, Btg. Rejang
100.	Sarawak	Kapit	Rh. Bato/John, Btg. Rejang
101.	Sarawak	Kapit	Rh. Garai/Bakar/Achong Btg. Rejang
102.	Sarawak	Kapit	Rh. Belaja, Btg. Rejang
103.	Sarawak	Kapit	Rh. Sellih, Ng. Encheremin
104.	Sarawak	Kapit	Rh. Seliong, Encheremin
105.	Sarawak	Kapit	Rh. Puso, Encheremin
106.	Sarawak	Kapit	Rh. Anjah/Daniel Dian Btg. Rejang
107.	Sarawak	Kapit	Rh. Maling, Btg. Rejang
108.	Sarawak	Kapit	Rh. Kunjan, Btg. Rejang
109.	Sarawak	Kapit	Rh. Melintang, Bt. Rejang
110.	Sarawak	Kapit	Rh. Bujah, Btg. Rejang
111.	Sarawak	Kapit	Rh. George, Ng. Seaur Btg. Rejang
112.	Sarawak	Kapit	Rh. Ekong, Btg. Rejang
113.	Sarawak	Kapit	Rh. Sekudan, Bt. Rejang
114.	Sarawak	Kapit	Rh. Itan Sg. Iran
115.	Sarawak	Kapit	Rh. Jak Sg. Pelagus

116.	Sarawak	Kapit	Rh. Garuda
117.	Sarawak	Kapit	Rh. Sigo/Jalit
118.	Sarawak	Kapit	Rh. Bajan
119.	Sarawak	Kapit	Rh. Tang
120.	Sarawak	Kapit	Rh. Jenggut
121.	Sarawak	Kapit	Rh. Assan
122.	Sarawak	Kapit	Rh. Lassang
123.	Sarawak	Kapit	Rh. Laja, Ng. Peraran
124.	Sarawak	Kapit	Rh. Along
125.	Sarawak	Kapit	Rh. Jelani
126.	Sarawak	Kapit	Rh. Sekin
127.	Sarawak	Kapit	Rh. Atut
128.	Sarawak	Kapit	Rh. Lutau
129.	Sarawak	Kapit	Rh. Ngelai
130.	Sarawak	Kapit	Rh. Lawrence Lannie
131.	Sarawak	Kapit	Rh. Berundang
132.	Sarawak	Kapit	Rh. Milang
133.	Sarawak	Kapit	Rh. Bdol
134.	Sarawak	Kapit	Rh. Denggat/Yan
135.	Sarawak	Kapit	Rh. Bidut
136.	Sarawak	Kapit	Rh. Guyang
137.	Sarawak	Kapit	Rh. Entili
138.	Sarawak	Kapit	Rh. Laja. Ng. Musa
139.	Sarawak	Kapit	Rh. Pillai
140.	Sarawak	Kapit	Rh. Steven Jana
141.	Sarawak	Kapit	Rh. Lanting
142.	Sarawak	Kapit	Rh. Manai
143.	Sarawak	Kapit	Rh. Ama
144.	Sarawak	Kapit	Rh. Jingga

145.	Sarawak	Kapit	Rh. Nyanggau
146.	Sarawak	Kapit	Rh. Jawan
147.	Sarawak	Kapit	Rh Empang.
148.	Sarawak	Kapit	Rh. Mero
149.	Sarawak	Kapit	Rh. Aji
150.	Sarawak	Kapit	Rh. Gendang
151.	Sarawak	Kapit	Rh. Lanying
152.	Sarawak	Kapit	Rh. Siden/Ranging
153.	Sarawak	Kapit	Rh. Sadang
154.	Sarawak	Kapit	Rh. Gelimai
155.	Sarawak	Kapit	Rh. Peraie
156.	Sarawak	Kapit	Rh. Bengau
157.	Sarawak	Kapit	Rh. Sumbang/Tadong
158.	Sarawak	Kapit	Rh. Kaya
159.	Sarawak	Kapit	Rh. Kanang/Ayat
160.	Sarawak	Kapit	Rh. Juntan
161.	Sarawak	Kapit	Rh. Mikai
162.	Sarawak	Kapit	Rh. Taing
163.	Sarawak	Kapit	Rh. Braoh
164.	Sarawak	Kapit	Rh. Sipang (Sut)
165.	Sarawak	Kapit	Rh. Belikau
166.	Sarawak	Kapit	Rh. Jugah
167.	Sarawak	Kapit	Rh. Salang
168.	Sarawak	Kapit	Rh. Nyengat
169.	Sarawak	Kapit	Rh. Ugap
170.	Sarawak	Kapit	Rh. Undi Ak Langkau
171.	Sarawak	Kapit	Rh. Sipang (Bena)
172.	Sarawak	Kapit	Rh. Achan
173.	Sarawak	Kapit	Rh. Pengabang

174.	Sarawak	Kapit	Rh. Mamut
175.	Sarawak	Kapit	Rh. Tedong
176.	Sarawak	Kapit	Rh. Ganging
177.	Sarawak	Kapit	Rh. Banta
178.	Sarawak	Kapit	Rh. Nabau/Philimon
179.	Sarawak	Kapit	Rh. Sigan
180.	Sarawak	Kapit	Rh. Jampong
181.	Sarawak	Kapit	Rh. Gawan
182.	Sarawak	Kapit	Rh. Umping
183.	Sarawak	Kapit	Rh. Ukau
184.	Sarawak	Kapit	Rh. Likong
185.	Sarawak	Kapit	Rh. William Ubu
186.	Sarawak	Kapit	Rh. Emak
187.	Sarawak	Kapit	Rh. Unyat
188.	Sarawak	Kapit	Rh. Raong
189.	Sarawak	Kapit	Rh. Nyamuk
190.	Sarawak	Kapit	Rh. Nyawai.
191.	Sarawak	Kapit	Rh. Mamat/Tajai
192.	Sarawak	Kapit	Rh. Sait
193.	Sarawak	Kapit	Rh. Gendang/Sugit
194.	Sarawak	Kapit	Rh. Tukau
195.	Sarawak	Kapit	Rh. Kupa
196.	Sarawak	Kapit	Rh. Ding
197.	Sarawak	Kapit	Rh. Bawing/Jawing
198.	Sarawak	Kapit	Rh. Bawing/Kendawang
199.	Sarawak	Kapit	Rh. Nading
200.	Sarawak	Kapit	Rg. Ragai
201.	Sarawak	Kapit	Rh. Belikau
202.	Sarawak	Kapit	Rh. Lawan

203.	Sarawak	Kapit	Rh. Untam Kerangan Ara, Balleh
204.	Sarawak	Kapit	Rh. Biduk
205.	Sarawak	Kapit	Rh. Steward/Ambau
206.	Sarawak	Kapit	Rh. Panggau
207.	Sarawak	Kapit	Rh. Sumbang, Ng. Serian
208.	Sarawak	Kapit	Rh. Buja
209.	Sarawak	Kapit	Rh. Nyawai
210.	Sarawak	Kapit	Rh. Insong
211.	Sarawak	Kapit	Rh. Gare
212.	Sarawak	Kapit	Rh. Layang
213.	Sarawak	Kapit	Ng. Gaat Settlement
214.	Sarawak	Kapit	Rh. Jampang
215.	Sarawak	Kapit	Rh. Ajut/Wong Lepong Semawang, Balleh
216.	Sarawak	Kapit	Rh. Mengga
217.	Sarawak	Kapit	Rh. Janggu
218.	Sarawak	Kapit	Rh. Malong
219.	Sarawak	Kapit	Rh. Benggau
220.	Sarawak	Kapit	Rh. Guyang
221.	Sarawak	Kapit	Rh. Jack Bidai
222.	Sarawak	Kapit	Rh. Bigau (Ujan)
223.	Sarawak	Kapit	Rh. Ugoh
224.	Sarawak	Kapit	Rh. Unyat
225.	Sarawak	Kapit	Rh. Jantai
226.	Sarawak	Kapit	Rh. Ramba
227.	Sarawak	Kapit	Rh. Nabau/Jack
228.	Sarawak	Kapit	Rh. John
229.	Sarawak	Kapit	Rh. Jamit
230.	Sarawak	Kapit	Rh. Taman Munan, Lg. Singut
231.	Sarawak	Kapit	Rh. Nyawai

232.	Sarawak	Kapit	Rh. Sebuang (Inang)
233.	Sarawak	Kapit	Rh. Itu
234.	Sarawak	Kapit	Rh. Bansa, Sepulau Balleh
235.	Sarawak	Kapit	Rh. Rantai, Ng. Semunte, Balleh
236.	Sarawak	Kapit	Rh. Baling (Naong), Batu Bansu, Balleh
237.	Sarawak	Kapit	Rh. Labaw, Teluk Gimang, Balleh
238.	Sarawak	Kapit	Rh. Sipang, Ng. Banyau, Balleh
239.	Sarawak	Kapit	Rh. Inting, Ng. Banyau, Balleh
240.	Sarawak	Kapit	Rh. Ekau, Ng. Mujong, Mujong
241.	Sarawak	Kapit	Rh. Balai, Lepong Sg. Mujong
242.	Sarawak	Kapit	Rh. Asun, Lepong Sg. Mujong
243.	Sarawak	Kapit	Rh. Tujang Ng. Usun, Balleh
244.	Sarawak	Kapit	Rh. Nyanggau, Ng. Usun, Balleh
245.	Sarawak	Kapit	Rh. Jimbun, Pulau Won, Balleh
246.	Sarawak	Kapit	Rh. Wong Bajit, Teluk Buing, Balleh
247.	Sarawak	Kapit	Rh. Unggang, Ng. Sepanggir, Balleh
248.	Sarawak	Kapit	Rh. Wong Linsong, Ng. Sepata, Balleh
249.	Sarawak	Kapit	Rh. Agang, Ng. Seketam, Balleh
250.	Sarawak	Kapit	Rh. Sengkuai, Ng. Selaut, Balleh
251.	Sarawak	Kapit	Rh. Mawang, Ng. Suau, Balleh
252.	Sarawak	Kapit	Rh. Weng, Ng. Sempurau, Sg. Mujong
253.	Sarawak	Kapit	Rh. Bangkong, Ng. Sebala, Sg. Mujong
254.	Sarawak	Kapit	Rh. Nawin, Ng. Oyan, Sg. Mujong
255.	Sarawak	Kapit	Rh. Lumpun, Rantau Tekam, Sg. Oyan
256.	Sarawak	Kapit	Rh. Umpang, Rantau Lelengau, Sg. Oyan
257.	Sarawak	Kapit	Rh. Jarau, Ng. Sekeroh, Sg. Oyan
258.	Sarawak	Kapit	Rh. Jimba, Sg. Sekeroh Tgh, Oyan
259.	Sarawak	Kapit	Rh. Jana, Ng. Gelong, Sg. Sekeroh
260.	Sarawak	Kapit	Rh. Alan, Ng. Gelong, Sg. Sekeroh

261.	Sarawak	Kapit	Rh. Lapik/Rh. Linggi, Ng. Jelayan, Sg. Sekeroh
262.	Sarawak	Kapit	Rh. Alex, Ng. Suau, Oyan
263.	Sarawak	Kapit	Rh. Minggat, Sg. Oyan Tgh
264.	Sarawak	Kapit	Rh. Saong, Tatai Panto, Sg. Oyan
265.	Sarawak	Kapit	Rh. Jabing, Ng. Sebinjai, Sg. Oyan
266.	Sarawak	Kapit	Rh. Saba, Ng. Segerugo, Sg. Oyan
267.	Sarawak	Kapit	Rh. Anding, Ng. Sepuna, Sg. Mujong
268.	Sarawak	Kapit	Rh. Peter, Rantau Bidai, Sg. Mujong
269.	Sarawak	Kapit	Rh. Liok, Wong Panto, Sg. Mujong
270.	Sarawak	Kapit	Rh. Along, Ng. Sg. Majau, Mujong
271.	Sarawak	Kapit	Rh. Insin/Nilson, Rantau Bebelit, Sg. Paku
272.	Sarawak	Kapit	Rh. Tang, Ng. Sebilat, Sg. Paku
273.	Sarawak	Kapit	Rh. Jembu, Ng. Sekilang, Sg. Paku
274.	Sarawak	Kapit	Rh. Inguh, Ng. Sepitoh, Sg. Paku
275.	Sarawak	Kapit	Rh. Jamba, Wong Tukok, Sg. Paku
276.	Sarawak	Kapit	Rh. Tujang, Ng. Sebelanda, Sg. Paku
277.	Sarawak	Kapit	Rh. Baya, Rantau Lelengai, Sg. Oyan
278.	Sarawak	Kapit	Rh. Masam/Unting, Ng. Sekeroh, Sg. Oyan
279.	Sarawak	Kapit	Rh. Kanyan, Ng. Sepasir, Sg. Mujong
280.	Sarawak	Kapit	Rh. Geramong, Ng. Sipoh, Sg. Mujong
281.	Sarawak	Kapit	Rh. Lubang, Ng. Sipoh, Sg. Mujong
282.	Sarawak	Kapit	Rh. Gawan, Ng. Aman, Sg. Mujong
283.	Sarawak	Kapit	Rh. Badin, Ng. Aman, Sg. Mujong
284.	Sarawak	Kapit	Rh. Gindal, Pulau Sibau, Sg. Mujong
285.	Sarawak	Kapit	Rh. Demong, Ng. Sebatang, Sg. Mujong
286.	Sarawak	Kapit	Ng. Melinau Settlement
287.	Sarawak	Kapit	Rh. Tanggai, Ng. Sekali, Sg. Mujong
288.	Sarawak	Kapit	Rh. Ejon, Ng. Sg. Tiau, Mujong
289.	Sarawak	Kapit	Rh. Sengiang, Ng. Ikah, Sg. Mujong

290.	Sarawak	Kapit	Rh. Jos, Ng. Selamas, Sg. Mujong
291.	Sarawak	Kapit	Rh. Tinggom, Emperan Jawong, Mujong
292.	Sarawak	Kapit	Rh. Narok (gesang), Sg. Bebangan, Mujong
293.	Sarawak	Kapit	Rh. Mayau, Sg. Bebangan, Mujong
294.	Sarawak	Kapit	Rh. Nyawai, Sg. Bebangan, Mujong
295.	Sarawak	Kapit	Rh. Umbar, Sg. Tiau, Mujong
296.	Sarawak	Kapit	Rh. Ambu, Lepong Kasai, Sg. Tiau
297.	Sarawak	Kapit	Rh. Jala, Ng. Apan, Sg. Melinau
298.	Sarawak	Kapit	Rh. Anding, Ng. Meluan, Sg. Melinau
299.	Sarawak	Kapit	Rh. Barang, Ng. Pang, Sg. Melinau
300.	Sarawak	Kapit	Rh. Ungka, Tunoh
301.	Sarawak	Kapit	Rh. Cheri/Rh. Masam, Tunoh
302.	Sarawak	Kapit	Rh. Kilau, Tunoh
303.	Sarawak	Kapit	*Umah Bakah, Rh Eyom Mos, Long Bulan, Sand Anau
304.	Sarawak	Kapit	Rh. Pioh, Ng. Sepayang, Sg. Majau
305.	Sarawak	Kapit	Rh. Lugat, Ng. Semawang, Sg. Majau
306.	Sarawak	Kapit	Rh. Ajai, Ng. Senuang, Sg. Majau
307.	Sarawak	Kapit	Rh. Sanggau, Lubok Mawang, Sg. Majau
308.	Sarawak	Kapit	Rh. Anchi, Ng. Sepajie, Sg. Majau
309.	Sarawak	Kapit	Rh. Tani, Tumoh Scheme
310.	Sarawak	Kapit	Rh. Mansai, Ng. Sengkabang, Sg. Majau
311.	Sarawak	Kapit	Rh. Ngiang, Ng. Sepaku, Sg. Majau
312.	Sarawak	Kapit	Rh. Austin Rungga, Ng. Sepayang, Sg. Yong
313.	Sarawak	Kapit	Rh. Anong, Ng. Selubok, Btg. Rajang
314.	Sarawak	Kapit	Rh. Angkin Repin, Ng. Yong, Btg. Rajang
315.	Sarawak	Kapit	Rh. Beraoh, Lepong Mejaban, Sg. Melipis
316.	Sarawak	Kapit	Rh. Baja, Ng. Selirik, Sg. Entangai
317.	Sarawak	Kapit	Rh. Bena, Ng. Sema, Sg. Yong
318.	Sarawak	Kapit	Rh. Beli, Ng. Ensurai Ibau, Btg. Rajang

319.	Sarawak	Kapit	Rh. Ekau Baring, Ng. Semawang, Btg. Rajang
320.	Sarawak	Kapit	Rh. Empawi, Ng. Sekukut, Sg. Yong
321.	Sarawak	Kapit	Rh Gerinsa, Ng Sepayang Ibau
322.	Sarawak	Kapit	Rh. George, Ng. Danau, Sg. Yong
323.	Sarawak	Kapit	Rh. Jampong, Ng. Ibau Ili, Btg. Rajang
324.	Sarawak	Kapit	Rh. Jandok, Ng. Sebabai, Sg.Yong
325.	Sarawak	Kapit	Rh. Jandah, Ng. Nansang, Ng. Ibau
326.	Sarawak	Kapit	Rh. James Gera, Sg. Melipis, Btg. Rajang
327.	Sarawak	Kapit	Rh. Jubang Deng, Ng. Pangai, Sg. Ibau
328.	Sarawak	Kapit	Rh. Landi, Ng. Tubu, Batang Rajang
329.	Sarawak	Kapit	Rh. Lapek, Ng. Engkatit, Sg. Yong
330.	Sarawak	Kapit	Rh. Leo Anthony, Ng. Ibau Ulu, Btg. Rajang
331.	Sarawak	Kapit	Rh. Lorie@Gembak, Ng. Ibau Tengah, Btg. Rajang
332.	Sarawak	Kapit	Rh. Liun, Ng Pangai, Sg Ibau, Btg Rajang
333.	Sarawak	Kapit	Rh. Mamat Tinggi, Ng. Buan, Btg. Rajang
334.	Sarawak	Kapit	Rh. Manok Manchal, Lubok Mawang, Sg.Yong
335.	Sarawak	Kapit	Rh. Mamaloh, Ng. Stapang, Sg.Yong
336.	Sarawak	Kapit	Rh. Messop, Ulu Sg. Entangai
337.	Sarawak	Kapit	Rh. Mulai, Batu Ninding, Sg. Melipis
338.	Sarawak	Kapit	Rh. Ngelai Ampas, Ng. Tisa Yong
339.	Sarawak	Kapit	Rh. Peter Ranggau,Ng. Tau, Btg. Rajang
340.	Sarawak	Kapit	Rh. Rambor, Ng. Sadong, Sg. Melipis
341.	Sarawak	Kapit	Rh. Robert Ngumbang, Ng. Sebatu, Btg. Rajang
342.	Sarawak	Kapit	Rh. Roland Banggau, Sg. Tisa Yong
343.	Sarawak	Kapit	Rh. Sana Jepai, Ng. Pepedi, Btg. Rajang
344.	Sarawak	Kapit	Rh. Semut, Ng. Engkatit, Sg. Yong
345.	Sarawak	Kapit	Rh. Sergin Jingan, Ng. Wai, Btg. Rajang
346.	Sarawak	Kapit	Rh. Sigih Sandah, Emperan Menuang, Sg. Melipis

347.	Sarawak	Kapit	Rh. Tat, Sg. Entangai, Btg. Rajang
348.	Sarawak	Kapit	Rh Uho Jalak, Ng Segetu, Ibau
349.	Sarawak	Kapit	Rh Untang, Ng Sekura, Sg.Yong
350.	Sarawak	Kapit	Rh. Untat, Emperan Bemban, Sg. Melipis
351.	Sarawak	Kapit	Rh. Ungka Iba, Ng. Ibau Kanan, Btg. Rajang
352.	Sarawak	Kapit	Rh William Unchat, Batu Berdiri, Pala Menoa Sg Yong
353.	Sarawak	Kapit	Jawa Ak. Inang, Ng. Sangin Amang
354.	Sarawak	Kapit	Agan Ak. Minggat, Tapang Pungga
355.	Sarawak	Kapit	Baja Ak. Rawing, Ng. Nyikau, Btg. Rajang
356.	Sarawak	Kapit	Bundong Ak. Tajok, Sebabai Ili
357.	Sarawak	Kapit	Ilie Ak. Akin, Ng. Sebabu
358.	Sarawak	Kapit	Jawang Ak. Kilat, Kpg. Yati Jaya
359.	Sarawak	Kapit	John AK. Ramba, Sg. Sesibau Ili
360.	Sarawak	Kapit	Kemarau Ak. Unjil, Genturung Sekaban
361.	Sarawak	Kapit	Kiong Ak. Igang, Sg. Anggau
362.	Sarawak	Kapit	Meliyu Ak. Pilang, Sg. Pelajau
363.	Sarawak	Kapit	Rachman Ak. Seta, Sg. Sesibau Tengah
364.	Sarawak	Kapit	Nuang AK. Unjing, Lubok Lampah
365.	Sarawak	Kapit	Madang Ak. Jelani, Ng. Semulong Amang
366.	Sarawak	Kapit	Richard @ Yusop Ak. Engkeng, Sg. Amang Ulu
367.	Sarawak	Kapit	Unjah Ak. Engkang, Sg. Sesibau Ulu
368.	Sarawak	Kapit	Johnny Ak. Undi, Ng. Sebilat
369.	Sarawak	Kapit	Undi Ak. Manggai, Ng. Selidong Btg Rajang
370.	Sarawak	Kapit	Kuyat Ak. Mengga, Ng. Sebaning
371.	Sarawak	Kapit	Luit Ak. Achang, Genturong Pelajau Jaya
372.	Sarawak	Kapit	Osmond Minggan Ak. Engin, Ng. Ah
373.	Sarawak	Kapit	Mary Ak. Balan, Tatai Emas, Sungai Amang
374.	Sarawak	Kapit	Taba Ak. Jabu, Genturung Tatai Kenayalang

375.	Sarawak	Kapit	Saba @ Steward Saba Ak. Sawing, Genturong Terusa
376.	Sarawak	Kapit	Mattew Mit Ak. Sirai, Genturong Selapong 3
377.	Sarawak	Kapit	Sulong Ak. Penyutu, Genturong Sg. Ara
378.	Sarawak	Kapit	Ramba Ak. Agon, Ulu Terusa Amang
379.	Sarawak	Kapit	Nalong Ak. Kumbong, Sg. Nansang
380.	Sarawak	Kapit	Jamba Ak. Inson, Ng. Serangki, Btg. Rajang
381.	Sarawak	Kapit	Richard Ngipa Unting, Kpg. Puan Sri Tiong
382.	Sarawak	Kapit	Bunsi Ak. Lagan, Sg. Sepanto
383.	Sarawak	Kapit	Bejau Ak. Melayang, Tatai Panglima
384.	Sarawak	Kapit	Kasaw Ak. Bantil, Genturong Sawang A
385.	Sarawak	Kapit	Sillo Ak. Naul, Selepong
386.	Sarawak	Kapit	Rh Anjah, Batu Tukup Menuan
387.	Sarawak	Kapit	Rh Ayu, Ng Tulie Baruh
388.	Sarawak	Kapit	Rh Dick, Ng Lan Btg Rajang
389.	Sarawak	Kapit	Rh Dinggai, Sg Goh Ili
390.	Sarawak	Kapit	Rh Enchana, Lubok Pukau Menuan
391.	Sarawak	Kapit	Rh Gelu, Sekerangan Baruh Belawai
392.	Sarawak	Kapit	Rh Gia, Setepus Atas Menuan
393.	Sarawak	Kapit	Rh Igau, Bukong Baruh Menuan
394.	Sarawak	Kapit	Rh Jabang, Ng Sepayang Belawai
395.	Sarawak	Kapit	Rh Jackson Mangiring, Setepus Tengah Menuan
396.	Sarawak	Kapit	Rh Jacob Sigai, Ng Leon Menuan
397.	Sarawak	Kapit	Rh Jang, Sg Goh Tengah
398.	Sarawak	Kapit	Rh Janin Mikal, Lubok Baya Seranau
399.	Sarawak	Kapit	Rh Jambon Antas, Ng Ensilai Btg Rajang
400.	Sarawak	Kapit	Rh Jengging Bungkong, Ng Entamin Menuan
401.	Sarawak	Kapit	Rh Juin Chuit Poh, Rantau Tapang Seranau
402.	Sarawak	Kapit	Rh Kayan Nyelang, Ng Dia Kapit
403.	Sarawak	Kapit	Rh Seking, Ng. Merit, Batang Rajang

404.	Sarawak	Kapit	Rh Tiso, Sg. Akur, Merit, Batang Rajang
405.	Sarawak	Kapit	Rh Lita, Sg. Tembawai, Merit, Batang Rajang
406.	Sarawak	Kapit	Rh Julan, Sg. Metah Ulu, Merit, Batang Rajang
407.	Sarawak	Kapit	Rh Rajau, Sg. Metah Ili, Merit, Batang Rajang
408.	Sarawak	Kapit	Rh Pius, Ng.Banyau, Merit, Batang Rajang
409.	Sarawak	Kapit	Kpg. Ng. Man Ili
410.	Sarawak	Kapit	Rh Panjal Theophilus Unan, Ng.Baleh
411.	Sarawak	Kapit	Rh Panjai Edison Bugap
412.	Sarawak	Kapit	Rh Umping, Lepong Baleh Kiba
413.	Sarawak	Kapit	Rh Panjai Gawan, Emperan Pisang, Baleh
414.	Sarawak	Kapit	Rh Panjai Juin, Lepong Baleh B
415.	Sarawak	Kapit	Rh Panjai Jarraw, Ng,Sebunut
416.	Sarawak	Kapit	Rh Panjai Jampong, Ng.Banyau Ili, Baleh
417.	Sarawak	Kapit	Rh Minggat, Ng.Bawai A, Baleh
418.	Sarawak	Kapit	Rh Panjai Ukau, Ng. Bawai B, Baleh
419.	Sarawak	Kapit	Rh Milang, Ng. Sepako, Baleh
420.	Sarawak	Kapit	Rh Panjai Bengau, Ng.Seraja, Lepong Sut, Baleh
421.	Sarawak	Kapit	Rh Panjai Irin, Ng. Setuai, Sg. Sut
422.	Sarawak	Kapit	Rh Panjai Kaya, Ng. Luba, Sg.Sut, P.O.B. 227
423.	Sarawak	Kapit	Rh Panjai Kanang, Ng.Kebiau, Sg.Sut
424.	Sarawak	Kapit	Rh Panjai Juntan, Ng.Elik, Sg.Sut
425.	Sarawak	Kapit	Rh Mikai, Lubok Nimoh, Sg. Sut
426.	Sarawak	Kapit	Rh Panjai Taing, Ng.Bena, Sg.Sut
427.	Sarawak	Kapit	Rh Panjai Beraoh, Tembawai Sandong Baroh, Sg.Sut
428.	Sarawak	Kapit	Rh Achong, Ng. Benin Ulu, Btg Rajang
429.	Sarawak	Kapit	Rh Ajan, Sg. Aya, Btg Rajang
430.	Sarawak	Kapit	Rh Antau, Ng.Ara, Sg. Pelagus
431.	Sarawak	Kapit	Rh Belaja, Ng.Benin Tengah, P.O.B 268, Btg Rajang

432.	Sarawak	Kapit	Rh Belikau, Pulau Raya, Btg Rajang
433.	Sarawak	Kapit	Rh Beraoh, Ng. Semenuang Ili, Btg Rajang
434.	Sarawak	Kapit	Rh Bujoh, Kerangan Bangat B, Btg Rajang
435.	Sarawak	Kapit	Rh Bunyau, Pulai pisang Ili. Btg Rajang
436.	Sarawak	Kapit	Rh Bujah, Ng.Pelangus, Btg Rajang
437.	Sarawak	Kapit	Rh Daniel Dian, Ng. Baki, P.O.B 160, Btg Rajang
438.	Sarawak	Kapit	Rh Gani, Pulau Pisang Ulu, Btg Rajang
439.	Sarawak	Kapit	Rh George, Ng. Sebunut, Sg. Pelagus
440.	Sarawak	Kapit	Rh Lawu, Sg. Kapit Ulu, Btg Rajang
441.	Sarawak	Kapit	Rh Jak, Ng,Setabau, Sg.Pelagus, Kapit
442.	Sarawak	Kapit	Rh Jalani, Keragan Bangat A, Btg Rajang
443.	Sarawak	Kapit	Rh Jantai, Ng. Serian, Sg.Echeremin, Kapit
444.	Sarawak	Kapit	Rh Jengeng, Ng.Mela, Btg Rajang
445.	Sarawak	Kapit	Rh John Asun, Ng.Benin Ili, Btg Rajang
446.	Sarawak	Kapit	Rh Jonathan Kaya, Ng.Pelagus Asal, Btg Rajang
447.	Sarawak	Kapit	Rh Kendawang, Ng.Aya, Btg Rajang
448.	Sarawak	Kapit	Rh Kunjan, Ng.Merating, Btg Rajang
449.	Sarawak	Kapit	Rh Majo, Sg Iran Pelagus
450.	Sarawak	Kapit	Rh Maling, Ng.Setapang Stelok, Btg Rajang
451.	Sarawak	Kapit	Rh Melintang, Nanga Kapit Ulu, Btg Rajang
452.	Sarawak	Kapit	Rh Puso, Ng. Merating Sg. Echeremin
453.	Sarawak	Kapit	Rh Rabar, Ng. Stapang, Btg Rajang
454.	Sarawak	Kapit	Rh Seliong, Tanjong Mass, Sg.Encheremin
455.	Sarawak	Kapit	Rh Sekudan, Rantau Lelangau, Sg. Pelagus
456.	Sarawak	Kapit	Rh Tungan, Ng.Semenuang Ulu, Btg Rajang
457.	Sarawak	Kapit	Rh Aji, Ng.Ibun Sg.Pila, Merit, Btg Rajang
458.	Sarawak	Kapit	Rh Ama, Ng. Metah, Merit, Btg Rajang
459.	Sarawak	Kapit	Rh anthony, Ng.Mujan A, Merit, Btg Rajang
460.	Sarawak	Kapit	Rh Atut, Ng.Peraran Kiba, Merit, Btg Rajang

461.	Sarawak	Kapit	Rh Alice Beda, Ng. Mujan Kanan A, Merit, Btg Rajang
462.	Sarawak	Kapit	Rh Berundang, Ng. Ensawi Tengah, Merit, Btg Rajang
463.	Sarawak	Kapit	Rh Panjai Budit, ng. Mekey Ili, Merit, Btg Rajang
464.	Sarawak	Kapit	Rh Dundang, Lubok Baya, Sg. Pila, Merit, Btg Rajang
465.	Sarawak	Kapit	Rh Empang, Ng.Bilat, Sg.Pila, Merit, Btg Rajang
466.	Sarawak	Kapit	Rh Entili, Ng.Musa Ili, Merit, Btg Rajang
467.	Sarawak	Kapit	Rh Garu, Sg Tekalong, Merit, Nbg Rajang
468.	Sarawak	Kapit	Rh Gerinau, Ng.Serian, Sg.Pila, Merit, Btg Rajang
469.	Sarawak	Kapit	Rh Gendang, Ng.Piun, Sg. Pila, Merit, Btg Rajang
470.	Sarawak	Kapit	Rh Guyang, Ng. Jeli, Merit, Btg Rajang
471.	Sarawak	Kapit	Rh Ibin, Ng Mejup, Sg Metah, Btg Rajang
472.	Sarawak	Kapit	Rh Jalit, Pasir Nai, Merit, Btg Rajang
473.	Sarawak	Kapit	Rh Jamit, Ng. Letong A, Merit, Btg Rajang
474.	Sarawak	Kapit	Rh Jelanie, Ng.Sama, Merit, Btg Rajang
475.	Sarawak	Kapit	Rh Jengot, Ng. Bulo, Merit, Btg Rajang
476.	Sarawak	Kapit	Rh Kanyan, Kaki Wong Mikai, Merit
477.	Sarawak	Kapit	Rh Laja, Ng. Peraran Kanan, Merit, Btg Rajang
478.	Sarawak	Kapit	Rh Lawrence, Ng.Ensawi Ili, Merit, Btg Rajang
479.	Sarawak	Kapit	Rh Lanting, Ng.Metah, Merit, Btg Rajang
480.	Sarawak	Kapit	Rh Lasang, Ng Mekey Ulu, Btg Rajang
481.	Sarawak	Kapit	Rh Mero, Lubok Dabai, Sg.Pila, Merit, Btg Rajang
482.	Sarawak	Kapit	Rh Milang, Ng. Ensawi Ulu, Merit, Btg Rajang
483.	Sarawak	Kapit	Rh Ngelai, Ng.Danau, Merit, Btg Rajang
484.	Sarawak	Kapit	Rh Pilai, Ng.Pila, Merit, Btg Rajang
485.	Sarawak	Kapit	Rh Richard, Sg. Tekalong, Merit, Btg Rajang
486.	Sarawak	Kapit	Rh Robin, Sg.Pedalai, Merit , Btg Rajang
487.	Sarawak	Kapit	Rh Sabang, Ng.Buya, Merit, Btg Rajang

488.	Sarawak	Kapit	Rh Sadang, Ng.Sekawi, Sg Metah, Merit, Btg Rajang
489.	Sarawak	Kapit	Rh Setepan Jana, Tinting Mawang Manis Ng.Pila, Merit, Btg Rajang
490.	Sarawak	Kapit	Rh Sabang Jampong, Ng Metah Ili, Btg Rajang
491.	Sarawak	Kapit	Rh Tang, Ng.Dap, Merit, Btg Rajang
492.	Sarawak	Kapit	Rh Vincent Banggau, Sg Pila, Btg rajang
493.	Sarawak	Kapit	Rh William Jete, Ng. Letong B, Sg.Pila, Merit, Btg Rajang

SONG DISTRICT

	Negeri	Daerah	Kampung
1.	Sarawak	Song	Achau Anak Sigaw
2.	Sarawak	Song	Akang Anak Jebeng
3.	Sarawak	Song	Albert Lajong Ak Maja
4.	Sarawak	Song	Anjan Ak Gaid
5.	Sarawak	Song	Anong
6.	Sarawak	Song	Api Ak Sanjun
7.	Sarawak	Song	Assan Ak Munan
8.	Sarawak	Song	Austin Ekau Ak Nyabang
9.	Sarawak	Song	Aut Ak Ujom
10.	Sarawak	Song	Bada Anak Abit
11.	Sarawak	Song	Bada Ak Ijang
12.	Sarawak	Song	Bagan Ak Jugam
13.	Sarawak	Song	Baja Ak Jabang
14.	Sarawak	Song	Bana Ak Libau
15.	Sarawak	Song	Banggau Ak Muran
16.	Sarawak	Song	Bantin Ak Masam
17.	Sarawak	Song	Barain Ak Padang
18.	Sarawak	Song	Baro Ak Mawa
19.	Sarawak	Song	Berago Ak Empawi
20.	Sarawak	Song	Braoh
21.	Sarawak	Song	Bilun Ak Taboh
22.	Sarawak	Song	Bukit Ak Simpai
23.	Sarawak	Song	Buni Ak Jengging
24.	Sarawak	Song	Cecelia Bunsu Ak Sebat
25.	Sarawak	Song	Chang Ak Jenang
26.	Sarawak	Song	Changgai Ak Baring
27.	Sarawak	Song	Chirry Ak Jamal
28.	Sarawak	Song	Cyril Busau Ak Unjong

29.	Sarawak	Song	Dagom Ak Sanggai
30.	Sarawak	Song	David Mayan Ak Sibat
31.	Sarawak	Song	Delok Ak Riti
32.	Sarawak	Song	Demang Ak Rebai
33.	Sarawak	Song	Dominic Rungom Ak Jugah
34.	Sarawak	Song	Dunggo Ak Madong
35.	Sarawak	Song	Ebin Ak Lagak
36.	Sarawak	Song	Ekeh Ak Kayam
37.	Sarawak	Song	Empatie Ak Geramong
38.	Sarawak	Song	Endah Ak Kap
39.	Sarawak	Song	Enggong Ak Imba
40.	Sarawak	Song	Ensam Ak Ibang
41.	Sarawak	Song	Erung Ak Geramong
42.	Sarawak	Song	Gaing Ak Tingai
43.	Sarawak	Song	Garai Ak Seliong
44.	Sarawak	Song	Garing Ak Pangit
45.	Sarawak	Song	Gawan Ak Pang
46.	Sarawak	Song	Gendang Ak Saweng
47.	Sarawak	Song	Geruma Ak Ayom
48.	Sarawak	Song	Gerunsin Ak Pagang
49.	Sarawak	Song	Gilbert Nyadang Ak Tinggi
50.	Sarawak	Song	Gindi Ak Jimbun
51.	Sarawak	Song	Gindi Ak Maling
52.	Sarawak	Song	Gong Ak Kerabor
53.	Sarawak	Song	Ibi Ak Saoh
54.	Sarawak	Song	Ijau Ak Sibat
55.	Sarawak	Song	Imbal Ak Kuchaw
56.	Sarawak	Song	Ismail Ak Siam
57.	Sarawak	Song	Jabu Ak Braoh

58.	Sarawak	Song	Jakson Usun Ak Jana
59.	Sarawak	Song	Jala Ak Ugol
60.	Sarawak	Song	Jamal Ak Sawang
61.	Sarawak	Song	Jamba Ak Nyantaw
62.	Sarawak	Song	James Ak Baleng
63.	Sarawak	Song	Jannang Ak Mapang
64.	Sarawak	Song	Japok Ak Ribai
65.	Sarawak	Song	Jarop Ak Bungkong
66.	Sarawak	Song	Jaya Ak Minggat
67.	Sarawak	Song	Jempai Ak Lau
68.	Sarawak	Song	Jenang Aj Junwing @ Kunyo
69.	Sarawak	Song	Jimbon Ak Lapik
70.	Sarawak	Song	Jinggong Ak Agan
71.	Sarawak	Song	Jipon Ak Limbi
72.	Sarawak	Song	John Ak Dinggai
73.	Sarawak	Song	John Ak Limbang
74.	Sarawak	Song	Joslee Ak Unchat
75.	Sarawak	Song	Kana Ak Antalai
76.	Sarawak	Song	Kana Ak Chaong
77.	Sarawak	Song	Kana Ak Langgai
78.	Sarawak	Song	Kawin Ak Laja
79.	Sarawak	Song	Kaya Ak Nyelang
80.	Sarawak	Song	Kelau Ak Matong
81.	Sarawak	Song	Kennedy Ak Anyau
82.	Sarawak	Song	Kideng Ak Luang
83.	Sarawak	Song	Kujau Ak Budon @ Guntor
84.	Sarawak	Song	Kulleh Ak Mohari
85.	Sarawak	Song	Kutak Ak Mugang
86.	Sarawak	Song	Landon Ak Manja

87.	Sarawak	Song	Langga Ak Bajai
88.	Sarawak	Song	Lasin Ak Buda
89.	Sarawak	Song	Layang Ak Sumbang
90.	Sarawak	Song	Lebak Ak Lidam
91.	Sarawak	Song	Leo Ak Sana
92.	Sarawak	Song	Lucas Ak Baru
93.	Sarawak	Song	Manila Ak Sibat
94.	Sarawak	Song	Manja Ak Belong
95.	Sarawak	Song	Matan Ak Manja
96.	Sarawak	Song	Medan Ak Lingga
97.	Sarawak	Song	Melayu Ak Angkup
98.	Sarawak	Song	Melina Ak Nyipa @ Minda
99.	Sarawak	Song	Mengkan Ak Jaee
100.	Sarawak	Song	Merom Ak Sultan
101.	Sarawak	Song	Michael Lasu Ak Nyantau
102.	Sarawak	Song	Minah Ak Serit
103.	Sarawak	Song	Mohd Edwin B Abdullah
104.	Sarawak	Song	Muni Ak Belalang
105.	Sarawak	Song	Munting Ak Nabau
106.	Sarawak	Song	Mulai
107.	Sarawak	Song	Musin Ak Anyok
108.	Sarawak	Song	Neglambong Ak Saoh
109.	Sarawak	Song	Gelana Ak Indong
110.	Sarawak	Song	Ngitar Ak Ali
111.	Sarawak	Song	Nugu Ak Irang
112.	Sarawak	Song	Nyala Ak Pang
113.	Sarawak	Song	Nyangun Ak Bundak
114.	Sarawak	Song	Byulang Ak Semuga
115.	Sarawak	Song	Peter Ak Jabat

116.	Sarawak	Song	Paing
117.	Sarawak	Song	Philip Ak Bagol
118.	Sarawak	Song	Philip Ak Geliga
119.	Sarawak	Song	Richard Nujong Ak Abit
120.	Sarawak	Song	Rambor
121.	Sarawak	Song	Sa Ak Andas
122.	Sarawak	Song	Saminggat Ak Sinki
123.	Sarawak	Song	Senabong Ak Nyipa
124.	Sarawak	Song	Sanda Ak Tading
125.	Sarawak	Song	Sangkar Ak Undi
126.	Sarawak	Song	Sebastian Tambi Ak Jugah
127.	Sarawak	Song	Selat Ak Mancha
128.	Sarawak	Song	Seligi Ak Selutan
129.	Sarawak	Song	Selugo Ak Sambang
130.	Sarawak	Song	Semada Ak Tandang
131.	Sarawak	Song	Sepawi Ak Kalau
132.	Sarawak	Song	Sering Ak Salang
133.	Sarawak	Song	Serit Ak Ngadit
134.	Sarawak	Song	Sigih
135.	Sarawak	Song	Serit Ak Uching
136.	Sarawak	Song	Sibat Ak Laeh
137.	Sarawak	Song	Sidi Ak Jengging
138.	Sarawak	Song	Silo Ak Bungkong
139.	Sarawak	Song	Stephen Ak Ajot
140.	Sarawak	Song	Sudin Ak Salang
141.	Sarawak	Song	Sugai Ak Sekau
142.	Sarawak	Song	Sumbang Ak Nandong
143.	Sarawak	Song	Sylvester Panau Ak Ragai
144.	Sarawak	Song	Taboh Ak Saweng

145.	Sarawak	Song	Tagi Ak Ungkar
146.	Sarawak	Song	Tanang Ak Likong
147.	Sarawak	Song	Timbon Ak Siba
148.	Sarawak	Song	Timothy Asson Ak Medan
149.	Sarawak	Song	Tugang Ak Bati
150.	Sarawak	Song	Untat
151.	Sarawak	Song	Vincent Ak Jugah
152.	Sarawak	Song	Wan Ak Ngi
153.	Sarawak	Song	Yonkap Ak Poh
154.	Sarawak	Song	Zachius Nyalu Ak Ambap
155.	Sarawak	Song	Sapai Ak Ajong
156.	Sarawak	Song	Kanin Ak Sibat
157.	Sarawak	Song	Kawin Ak Pau
158.	Sarawak	Song	Rh Melintang, Ng Achau Ulu Katibas
159.	Sarawak	Song	Rh Nobert, Ng Sesawa, Btg Rejang
160.	Sarawak	Song	Rh Nugu, Ng. Sebiau, Ulu Katibas
161.	Sarawak	Song	Rh Nyangun, Ng. Miaw Katibas
162.	Sarawak	Song	Rh Rantai, Rantau Assam Tekalit
163.	Sarawak	Song	Rh Ribut, Ng.Serau, Katibas
164.	Sarawak	Song	Rh Runi Ng Selepong Ulu Sg Iran
165.	Sarawak	Song	Rh Saing, Sungai Lajan, Btg Rejang
166.	Sarawak	Song	Rh Sapai, Ng. Ngeranau, Ulu Katibas
167.	Sarawak	Song	Rh Jugam, Ng. Ujat, Katibas Tengah
168.	Sarawak	Song	Rh Senit, Ng. Banjor, Katibas Tengah

Appendix 5.8.2

National Water Quality Standard for Malaysia
(NWQSM)

ANNEX

NATIONAL WATER QUALITY STANDARDS FOR MALAYSIA

PARAMETER	UNIT	CLASS				
		I	IIA/IIB	III#	IV	V
Al	mg/l	NATURAL LEVELS OR ABSENT	-	(0.06)	0.5	LEVELS ABOVE IV
As	mg/l		0.05	0.4 (0.05)	0.1	
Ba	mg/l		1	-	-	
Cd	mg/l		0.01	0.01* (0.001)	0.01	
Cr (VI)	mg/l		0.05	1.4 (0.05)	0.1	
Cr (III)	mg/l		-	2.5	-	
Cu	mg/l		0.02	-	0.2	
Hardness	mg/l		250	-	-	
Ca	mg/l		-	-	-	
Mg	mg/l		-	-	-	
Na	mg/l		-	-	3 SAR	
K	mg/l		-	-	-	
Fe	mg/l		1	1	1 (Leaf) 5 (Others)	
Pb	mg/l		0.05	0.02* (0.01)	5	
Mn	mg/l		0.1	0.1	0.2	
Hg	mg/l		0.001	0.004 (0.0001)	0.002	
Ni	mg/l		0.05	0.9*	0.2	
Se	mg/l		0.01	0.25 (0.04)	0.02	
Ag	mg/l		0.05	0.0002	-	
Sn	mg/l		-	0.004	-	
U	mg/l		-	-	-	
Zn	mg/l		5	0.4*	2	
B	mg/l		1	(3.4)	0.8	
Cl	mg/l		200	-	80	
Cl_2	mg/l		-	(0.02)	-	
CN	mg/l		0.02	0.06 (0.02)	-	
F	mg/l		1.5	10	1	
NO_2	mg/l		0.4	0.4 (0.03)	-	
NO_3	mg/l		7	-	5	
P	mg/l		0.2	0.1	-	
Silica	mg/l		50	-	-	
SO_4	mg/l		250	-	-	
S	mg/l		0.05	(0.001)	-	
CO_2	mg/l		-	-	-	
Gross-α	Bq/l		0.1	-	-	
Gross-β	Bq/l		1	-	-	
Ra-226	Bq/l		< 0.1	-	-	
Sr-90	Bq/l		< 1	-	-	
CCE	μg/l		500	-	-	-
MBAS/BAS	μg/l		500	5000 (200)	-	-
O & G (Mineral)	μg/l		40; N	N	-	-
O & G (Emulsified Edible)	μg/l		7000; N	N	-	-
PCB	μg/l		0.1	6 (0.05)	-	-
Phenol	μg/l		10	-	-	-
Aldrin/Dieldrin	μg/l		0.02	0.2 (0.01)	-	-
BHC	μg/l		2	9 (0.1)	-	-
Chlordane	μg/l		0.08	2 (0.02)	-	-
t-DDT	μg/l		0.1	(1)	-	-
Endosulfan	μg/l		10	-	-	-
Heptachlor/Epoxide	μg/l		0.05	0.9 (0.06)	-	-
Lindane	μg/l		2	3 (0.4)	-	-
2,4-D	μg/l		70	450	-	-
2,4,5-T	μg/l		10	160	-	-
2,4,5-TP	μg/l		4	850	-	-
Paraquat	μg/l		10	1800	-	-

Notes :
* = At hardness 50 mg/l $CaCO_3$
# = Maximum (unbracketed) and 24-hour average (bracketed) concentrations
N = Free from visible film sheen, discolouration and deposits

NATIONAL WATER QUALITY STANDARDS FOR MALAYSIA (cont.)

PARAMETER	UNIT	CLASS					
		I	IIA	IIB	III	IV	V
Ammoniacal Nitrogen	mg/l	0.1	0.3	0.3	0.9	2.7	> 2.7
Biochemical Oxygen Demand	mg/l	1	3	3	6	12	> 12
Chemical Oxygen Demand	mg/l	10	25	25	50	100	> 100
Dissolved Oxygen	mg/l	7	5 - 7	5 - 7	3 - 5	< 3	< 1
pH	-	6.5 - 8.5	6 - 9	6 - 9	5 - 9	5 - 9	-
Colour	TCU	15	150	150	-	-	-
Electrical Conductivity*	μS/cm	1000	1000	-	-	6000	-
Floatables	-	N	N	N	-	-	-
Odour	-	N	N	N	-	-	-
Salinity	ppt	0.5	1	-	-	2	-
Taste	-	N	N	N	-	-	-
Total Dissolved Solid	mg/l	500	1000	-	-	4000	-
Total Suspended Solid	mg/l	25	50	50	150	300	300
Temperature	^{o}C	-	Normal + 2 ^{o}C	-	Normal + 2 ^{o}C	-	-
Turbidity	NTU	5	50	50	-	-	-
Faecal Coliform**	count/100 ml	10	100	400	5000 (20000)[a]	5000 (20000)[a]	-
Total Coliform	count/100 ml	100	5000	5000	50000	50000	> 50000

Notes :

N : No visible floatable materials or debris, no objectional odour or no objectional taste
* : Related parameters, only one recommended for use
** : Geometric mean
a : Maximum not to be exceeded

WATER CLASSES AND USES

CLASS	USES
Class I	Conservation of natural environment. Water Supply I – Practically no treatment necessary. Fishery I – Very sensitive aquatic species.
Class IIA	Water Supply II – Conventional treatment required. Fishery II – Sensitive aquatic species.
Class IIB	Recreational use with body contact.
Class III	Water Supply III – Extensive treatment required. Fishery III – Common, of economic value and tolerant species; livestock drinking.
Class IV	Irrigation
Class V	None of the above.

Appendix 5.8.3

Water Quality Test Reports

CHEMSAIN KONSULTANT SDN BHD *(130904-U)*

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MS ISO/IEC 17025
TESTING
SAMM NO. 057

TEST REPORT

NOT FOR ADVERTISEMENT PURPOSES

Customer	:	Sarawak Energy Berhad Level 4, Menara Sarawak Energy No. 1, The Isthmus 93050 Kuching Sarawak	Lab No. Type (No.) of Sample Date Received Date of Report Project Code	: : : : :	CK/CL105/132244/20 Surface Water (13) 22nd October 2020 6th November 2020 CK/EV103/792/20

Lab No.	132244-1	132244-2	132244-3	*Method*
Parameter (s)	W1 Date : 21/10/20 Time : 9.35 am	W2 Date : 21/10/20 Time : 10.10 am	W4 Date : 21/10/20 Time : 10.25 am	
*Temperature, °C *(in-situ / 21/10/20)*	27.4	27.4	26.7	*APHA 2550 B, 2017*
*pH Value *(in-situ / 21/10/20)*	7.0	6.8	6.6	*APHA 4500-H^+ B, 2017*
*Dissolved Oxygen, mg/L *(in-situ / 21/10/20)*	5.8	5.7	5.7	*APHA 4500 -O G, 2017*
Turbidity (NTU)	60	70	65	*APHA 2130 B, 2017*
Biochemical Oxygen Demand in 5 days @ 20°C, mg/L	<1.0	<1.0	<1.0	*APHA 5210 B & 4500-O G, 2017*
Chemical Oxygen Demand, mg/L	18	13	21	*APHA 5220 C, 2017*
Total Suspended Solids, mg/L	50.8	63.6	54.0	*APHA 2540 D, 2017*
Total Dissolved Solids, mg/L	44.0	32.0	50.0	*APHA 2540 C, 2017*
Ammoniacal Nitrogen (as N), mg/L	0.08	0.05	0.08	*APHA 4500-NH_3 B & F, 2017*
Oil & Grease, mg/L	<1.0	<1.0	<1.0	*APHA 5520 B, 2017*

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Lab No. : CK/CL105/132244/20

Lab No.	132244-4	132244-5	132244-6	*Method*
Parameter (s)	W5 Date : 21/10/20 Time : 11.00 am	W6 Date : 21/10/20 Time : 11.10 am	W7 Date : 21/10/20 Time : 11.25 am	
*Temperature, °C *(in-situ / 21/10/20)*	27.1	28.1	27.8	*APHA 2550 B, 2017*
*pH Value *(in-situ / 21/10/20)*	6.8	6.6	6.7	*APHA 4500-H^+ B, 2017*
*Dissolved Oxygen, mg/L *(in-situ / 21/10/20)*	5.7	5.6	6.2	*APHA 4500 -O G, 2017*
Turbidity (NTU)	40	110	120	*APHA 2130 B, 2017*
Biochemical Oxygen Demand in 5 days @ 20°C, mg/L	<1.0	<1.0	<1.0	*APHA 5210 B & 4500-O G, 2017*
Chemical Oxygen Demand, mg/L	15	15	12	*APHA 5220 C, 2017*
Total Suspended Solids, mg/L	33.8	93.7	114	*APHA 2540 D, 2017*
Total Dissolved Solids, mg/L	32.0	40.0	45.0	*APHA 2540 C, 2017*
Ammoniacal Nitrogen (as N), mg/L	0.17	0.07	0.08	*APHA 4500-NH_3 B &F, 2017*
Oil & Grease, mg/L	<1.0	<1.0	<1.0	*APHA 5520 B, 2017*

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Lab No. : CK/CL105/132244/20

Lab No.	132244-7	132244-8	132244-9	*Method*
Parameter (s)	W8 Date : 21/10/20 Time : 11.50 am	W9 Date : 21/10/20 Time : 12.40 pm	W10 Date : 21/10/20 Time : 1.25 pm	
*Temperature, °C *(in-situ / 21/10/20)*	29.5	29.2	29.0	*APHA 2550 B, 2017*
*pH Value *(in-situ / 21/10/20)*	7.2	7.1	6.7	*APHA 4500-H^+ B, 2017*
*Dissolved Oxygen, mg/L *(in-situ / 21/10/20)*	5.1	5.7	5.6	*APHA 4500 -O G, 2017*
Turbidity (NTU)	1.6	0.80	70	*APHA 2130 B, 2017*
Biochemical Oxygen Demand in 5 days @ 20°C, mg/L	<1.0	<1.0	<1.0	*APHA 5210 B & 4500-O G, 2017*
Chemical Oxygen Demand, mg/L	11	11	20	*APHA 5220 C, 2017*
Total Suspended Solids, mg/L	<5.0	<5.0	41.6	*APHA 2540 D, 2017*
Total Dissolved Solids, mg/L	67.0	48.0	31.0	*APHA 2540 C, 2017*
Ammoniacal Nitrogen (as N), mg/L	<0.05	<0.05	0.10	*APHA 4500-NH_3 B & F, 2017*
Oil & Grease, mg/L	<1.0	<1.0	<1.0	*APHA 5520 B, 2017*

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Lab No. : CK/CL105/132244/20

Lab No.	131373-10	131373-11	131373-12	131373-13
Parameter (s)	W11 Date : 21/10/20 Time : 1.35 pm	W12 Date : 21/10/20 Time : 1.55 pm	W13 Date : 21/10/20 Time : 2.15 pm	W14 Date : 21/10/20 Time : 2.30 pm
Temperature, °C *(in-situ / 21/10/20)* *(Method : APHA 2550 B, 2017)*	28.4	28.6	28.2	28.3
pH Value *(in-situ / 21/10/20)* *(Method : APHA 4500-H^+ B, 2017)*	6.8	6.7	6.9	6.9
Dissolved Oxygen, mg/L *(in-situ / 21/10/20)* *(Method : APHA 4500-O G, 2017)*	5.3	6.1	5.8	5.3
Turbidity, NTU *(Method : APHA 2130 B, 2017)*	60	40	120	120
Biochemical Oxygen Demand in 5 days @ 20°C, mg/L *(Method : APHA 5210 B & 4500-O G, 2017)*	<1.0	<1.0	<1.0	1.4
Chemical Oxygen Demand, mg/L *(Method : APHA 5220 C, 2017)*	11	16	23	31
Total Suspended Solids, mg/L *(Method : APHA 2540 D, 2017)*	40.6	37.2	100	103
Total Dissolved Solids, mg/L *(Method : APHA 2540 C, 2017)*	28.0	88.0	50.0	45.0
Ammoniacal-Nitrogen (as N), mg/L *(Method : APHA 4500-NH_3 B & F, 2017)*	0.09	0.10	0.08	<0.05
Oil & Grease, mg/L *(Method : APHA 5520 B, 2017)*	<1.0	<1.0	<1.0	<1.0

*Not SAMM Accredited

Date of commencement of BOD_5 analysis: 22nd October 2020

Remark : The above pH readings are taken based on respective temperature reported

----------End----------

.....
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Customer	:	Sarawak Energy Berhad Level 4, Menara Sarawak Energy No. 1, The Isthmus 93050 Kuching Sarawak	Lab No. Type (No.) of Sample Date Received Date of Report Project Code	: CK/CL105/132254/20 : Surface Water (1) : 22nd October 2020 : 6th November 2020 : CK/EV103/792/20

Parameter (s)	W3 Date : 20/10/20 Time : 6.45 pm	*Method*
*Temperature, °C *(in-situ / 20/10/20)*	25.8	*APHA 2550 B, 2017*
*pH Value *(in-situ / 20/10/20)*	5.8	*APHA 4500-H^+ B, 2017*
*Dissolved Oxygen, mg/L *(in-situ / 20/10/20)*	6.1	*APHA 4500 -O G, 2017*
Turbidity (NTU)	120	*APHA 2130 B, 2017*
Biochemical Oxygen Demand in 5 days @ 20°C, mg/L	<1.0	*APHA 5210 B & 4500-O G, 2017*
Chemical Oxygen Demand, mg/L	26	*APHA 5220 C, 2017*
Total Suspended Solids, mg/L	62.6	*APHA 2540 D, 2017*
Total Dissolved Solids, mg/L	32.0	*APHA 2540 C, 2017*
Ammoniacal Nitrogen (as N), mg/L	0.09	*APHA 4500-NH_3 B & F, 2017*
Oil & Grease, mg/L	<1.0	*APHA 5520 B, 2017*

*Not SAMM Accredited

Date of commencement of BOD_5 analysis: 22nd October 2020

Remark : The above pH reading is taken based on respective temperature reported

----------End----------

.....
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TEST REPORT

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Customer	:	Sarawak Energy Berhad Level 4, Menara Sarawak Energy No. 1, The Isthmus 93050 Kuching Sarawak	Lab No.	: CK/CL105/132286/20
			Type (No.) of Sample	: Surface Water (11)
			Date Received	: 23rd October 2020
			Date of Report	: 11th November 2020
			Project Code	: CK/EV103/792/20

Lab No.	132286-1	132286-2	132286-3	*Method*
Parameter (s)	W15 Date : 22/10/20 Time : 3.00 pm	W16 Date : 22/10/20 Time : 2.45 pm	W17 Date : 22/10/20 Time : 2.28 pm	
*Temperature, °C *(in-situ / 22/10/20)*	28.5	28.4	27.4	*APHA 2550 B, 2017*
*pH Value *(in-situ / 22/10/20)*	6.5	6.6	7.0	*APHA 4500-H^+ B, 2017*
*Dissolved Oxygen, mg/L *(in-situ / 22/10/20)*	5.2	5.4	6.5	*APHA 4500 -O G, 2017*
Turbidity (NTU)	37	38	150	*APHA 2130 B, 2017*
Biochemical Oxygen Demand in 5 days @ 20°C, mg/L	<1.0	<1.0	<1.0	*APHA 5210 B & 4500-O G, 2017*
Chemical Oxygen Demand, mg/L	25	27	18	*APHA 5220 C, 2017*
Total Suspended Solids, mg/L	32.2	33.8	120	*APHA 2540 D, 2017*
Total Dissolved Solids, mg/L	41.0	28.0	44.0	*APHA 2540 C, 2017*
Ammoniacal Nitrogen (as N), mg/L	0.13	0.13	0.13	*APHA 4500-NH_3 B & F, 2017*
Oil & Grease, mg/L	<1.0	<1.0	<1.0	*APHA 5520 B, 2017*

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TEST REPORT

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Lab No. : CK/CL105/132286/20

Lab No.	132286-4	132286-5	132286-6	*Method*
Parameter (s)	W18 Date : 22/10/20 Time : 2.10 pm	W19 Date : 22/10/20 Time : 2.00 pm	W20 Date : 22/10/20 Time : 1.30 pm	
*Temperature, °C *(in-situ / 22/10/20)*	27.5	28.6	28.3	*APHA 2550 B, 2017*
*pH Value *(in-situ / 22/10/20)*	7.2	7.2	7.0	*APHA 4500-H^+ B, 2017*
*Dissolved Oxygen, mg/L *(in-situ / 22/10/20)*	6.6	6.4	6.4	*APHA 4500 -O G, 2017*
Turbidity (NTU)	110	6.3	49	*APHA 2130 B, 2017*
Biochemical Oxygen Demand in 5 days @ 20°C, mg/L	<1.0	<1.0	<1.0	*APHA 5210 B & 4500-O G, 2017*
Chemical Oxygen Demand, mg/L	20	28	22	*APHA 5220 C, 2017*
Total Suspended Solids, mg/L	98.2	5.4	38.8	*APHA 2540 D, 2017*
Total Dissolved Solids, mg/L	45.0	47.0	37.0	*APHA 2540 C, 2017*
Ammoniacal Nitrogen (as N), mg/L	0.13	0.11	0.12	*APHA 4500-NH_3 B & F, 2017*
Oil & Grease, mg/L	<1.0	<1.0	<1.0	*APHA 5520 B, 2017*

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Lab No. : CK/CL105/132286/20

Lab No.	132286-7	132286-8	132286-9	*Method*
Parameter (s)	W21 Date : 22/10/20 Time : 12.40 pm	W22 Date : 22/10/20 Time : 11.55 am	W23 Date : 22/10/20 Time : 11.20 am	
*Temperature, °C *(in-situ / 22/10/20)*	30.6	29.4	26.9	*APHA 2550 B, 2017*
*pH Value *(in-situ / 22/10/20)*	6.8	7.1	7.0	*APHA 4500-H^+ B, 2017*
*Dissolved Oxygen, mg/L *(in-situ / 22/10/20)*	4.8	4.9	6.9	*APHA 4500 -O G, 2017*
Turbidity (NTU)	1.5	0.70	11	*APHA 2130 B, 2017*
Biochemical Oxygen Demand in 5 days @ 20°C, mg/L	<1.0	<1.0	<1.0	*APHA 5210 B & 4500-O G, 2017*
Chemical Oxygen Demand, mg/L	15	23	13	*APHA 5220 C, 2017*
Total Suspended Solids, mg/L	<5.0	<5.0	9.4	*APHA 2540 D, 2017*
Total Dissolved Solids, mg/L	35.0	41.0	36.0	*APHA 2540 C, 2017*
Ammoniacal Nitrogen (as N), mg/L	0.11	0.13	<0.05	*APHA 4500-NH_3 B & F, 2017*
Oil & Grease, mg/L	<1.0	<1.0	<1.0	*APHA 5520 B, 2017*

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Lab No. : CK/CL105/132286/20

Lab No.	132286-10	132286-11	*Method*
Parameter (s)	W24 Date : 22/10/20 Time : 11.00 am	W25 Date : 22/10/20 Time : 10.50 am	
*Temperature, °C *(in-situ / 22/10/20)*	26.4	26.6	*APHA 2550 B, 2017*
*pH Value *(in-situ / 22/10/20)*	6.9	6.7	*APHA 4500-H^+ B, 2017*
*Dissolved Oxygen, mg/L *(in-situ / 22/10/20)*	6.8	7.4	*APHA 4500 -O G, 2017*
Turbidity (NTU)	2.9	8.5	*APHA 2130 B, 2017*
Biochemical Oxygen Demand in 5 days @ 20°C, mg/L	<1.0	<1.0	*APHA 5210 B & 4500-O G, 2017*
Chemical Oxygen Demand, mg/L	17	12	*APHA 5220 C, 2017*
Total Suspended Solids, mg/L	<5.0	6.6	*APHA 2540 D, 2017*
Total Dissolved Solids, mg/L	33.0	37.0	*APHA 2540 C, 2017*
Ammoniacal Nitrogen (as N), mg/L	0.16	0.14	*APHA 4500-NH_3 B & F, 2017*
Oil & Grease, mg/L	<1.0	<1.0	*APHA 5520 B, 2017*

*Not SAMM Accredited

Date of commencement of BOD_5 analysis: 23rd October 2020

Remark : The above pH readings are taken based on respective temperature reported

----------End----------

.....
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Customer	:	Sarawak Energy Berhad Menara Sarawak Energy No. 1, The Isthmus 93050 Kuching Sarawak.	Lab No.	:	CK/ML105/132245/20
			Type (No.) of Sample	:	Surface Water (13)
			Date Received	:	22nd October 2020
			Date of Report	:	28th October 2020
			Project Code	:	CK/EV103-792/20

Lab No	Identification of Sample(s)	Total Coliform Count MPN/100 mL, 35±0.5°C/48h *(Method : APHA 9221B, 2017)*	Fecal Coliform Count MPN/100 mL, 44.5±0.2°C/24 h *(Method : APHA 9221E, 2005)*
132245-1	W1 Date : 21/10/20 Time : 9.35 am	1.1×10^3	7.9×10^2
132245-2	W2 Date : 21/10/20 Time : 10.10 am	4.6×10^2	3.3×10^2
132245-3	W4 Date : 21/10/20 Time : 10.25 am	3.5×10^3	1.3×10^3
132245-4	W5 Date : 21/10/20 Time : 11.00 am	5.4×10^3	2.4×10^3
132245-5	W6 Date : 21/10/20 Time : 11.10 am	7.9×10^2	4.9×10^2
132245-6	W7 Date : 21/10/20 Time : 11.25 am	3.5×10^3	2.4×10^3
132245-7	W8 Date : 21/10/20 Time : 11.50 am	4.9×10^2	2.3×10^2
132245-8	W9 Date : 21/10/20 Time : 12.40 pm	7.9×10^2	7.9×10^2
132245-9	W10 Date : 21/10/20 Time : 1.25 pm	2.4×10^3	2.4×10^3
132245-10	W11 Date : 21/10/20 Time : 1.35 pm	1.3×10^3	1.3×10^3

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Lab No.: CK/ML105/132245/20

Lab No	Identification of Sample(s)	Total Coliform Count MPN/100 mL, 35±0.5°C/48h *(Method : APHA 9221B, 2017)*	Fecal Coliform Count MPN/100 mL, 44.5±0.2°C/24 h *(Method : APHA 9221E, 2005)*
132245-11	W12 Date : 21/10/20 Time : 1.55 pm	3.5×10^3	2.4×10^3
132245-12	W13 Date : 21/10/20 Time : 2.15 pm	9.2×10^3	2.4×10^3
132245-13	W14 Date : 21/10/20 Time : 2.30 pm	4.9×10^2	2.3×10^2

----------End----------

.....
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Customer	:	Sarawak Energy Berhad Menara Sarawak Energy No. 1, The Isthmus 93050 Kuching, Sarawak.	Lab No.	: CK/ML105/132255/20
			Type (No.) of Sample	: Surface Water (1)
			Date Received	: 22nd October 2020
			Date of Report	: 26th October 2020
			Project Code	: CK/EV103-792/20

Parameter(s)	W3 Date : 20/10/20 Time : 6.45 pm	*Test Method*
Total Coliform Count MPN/100 mL, 35±0.5°C/48 h	2.8×10^3	*APHA 9221 B, 2017*
Fecal Coliform Count MPN/100 mL, 44.5±0.2°C/24 h	1.3×10^3	*APHA 9221 E, 2005*

----------End----------

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Customer	:	Sarawak Energy Berhad Menara Sarawak Energy No. 1, The Isthmus 93050 Kuching Sarawak.	Lab No.	: CK/ML105/132287/20
			Type (No.) of Sample	: Surface Water (11)
			Date Received	: 23rd October 2020
			Date of Report	: 28th October 2020
			Project Code	: CK/EV103-792/20

Lab No	Identification of Sample(s)	Total Coliform Count MPN/100 mL, 35±0.5°C/48h *(Method : APHA 9221B, 2017)*	Fecal Coliform Count MPN/100 mL, 44.5±0.2°C/24 h *(Method : APHA 9221E, 2005)*
132287-1	W15 Date : 22/10/20 Time : 3.00 pm	3.3×10^2	2.3×10^2
132287-2	W16 Date : 22/10/20 Time : 2.45 pm	4.9×10^2	2.3×10^2
132287-3	W17 Date : 22/10/20 Time : 2.28 pm	7.9×10^2	2.3×10^2
132287-4	W18 Date : 22/10/20 Time : 2.10 pm	9.2×10^3	2.4×10^3
132287-5	W19 Date : 22/10/20 Time : 2.00 pm	5.4×10^3	2.4×10^3
132287-6	W20 Date : 22/10/20 Time : 1.30 pm	2.2×10^3	7.9×10^2
132287-7	W21 Date : 22/10/20 Time : 12.40 pm	2.4×10^3	2.4×10^3
132287-8	W22 Date : 22/10/20 Time : 11.55 am	3.5×10^3	2.4×10^3
132287-9	W23 Date : 22/10/20 Time : 11.20 am	1.3×10^3	1.3×10^3

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Lab No.: CK/ML105/132287/20

Lab No	Identification of Sample(s)	Total Coliform Count MPN/100 mL, 35±0.5°C/48h *(Method : APHA 9221B, 2017)*	Fecal Coliform Count MPN/100 mL, 44.5±0.2°C/24 h *(Method : APHA 9221E, 2005)*
132287-10	W24 Date : 22/10/20 Time : 11.00 am	1.3×10^3	2.3×10^2
132287-11	W25 Date : 22/10/20 Time : 10.50 am	4.9×10^2	3.3×10^2

----------End----------

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Customer	:	Sarawak Energy Berhad Menara Sarawak Energy Level 6, No.1, The Isthmus 93050 Kuching Sarawak	Lab No. Type (No.) of Sample Date Received Date of Report Project Code	: CK/CL105/132241/20 : Surface Water (4) : 22nd October 2020 : 13th November 2020 : CK/EV103/792/20

Lab No.	132241-1	132241-2	132241-3	132241-4
Parameter (s)	W1 Date : 21/10/20 Time : 9.35 am	W8 Date : 21/10/20 Time : 11.50 am	W9 Date : 21/10/20 Time : 12.40 pm	W14 Date : 21/10/20 Time : 2.30 pm
Lead (as Pb), mg/L *(Method : APHA 3030 F & 3111 B, 2017)*	<0.01	<0.01	<0.01	<0.01
Copper (as Cu), mg/L *(Method : APHA 3030 F & 3111 B, 2017)*	<0.02	<0.02	<0.02	0.26
Zinc (as Zn), mg/L *(Method : APHA 3030 F & 3111 B, 2017)*	0.03	0.03	0.18	0.04
Nickel (as Ni), mg/L *(Method : APHA 3030 F & 3111 B, 2017)*	<0.02	<0.02	<0.02	0.48
Cadmium (as Cd), mg/L *(Method : APHA 3030 F & 3111 B, 2017)*	<0.002	<0.002	<0.002	<0.002
Chromium, Hexavalent (as Cr^{6+}), mg/L *(Method : APHA 3500 Cr B, 2017)*	<0.02	<0.02	<0.02	<0.02
Chromium, Trivalent (as Cr^{3+}), mg/L *(Method : In House Method 0508 based on APHA 3500 Cr B, 1998)*	<0.02	<0.02	<0.02	<0.02
Iron (as Fe), mg/L *(Method : APHA 3030 F & 3111 B, 2017)*	3.02	0.22	0.70	4.45
Manganese (as Mn), mg/L *(Method : APHA 3030 F & 3111 B, 2017)*	0.04	<0.02	<0.02	0.08
Mercury (as Hg), mg/L *(Method : In House Method 0535 based on APHA 3112 B, 2017)*	<0.001	<0.001	<0.001	<0.001

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Lab No: CK/CL105/132241/20

Lab No.	132241-1	132241-2	132241-3	132241-4
Parameter (s)	W1 Date : 21/10/20 Time : 9.35 am	W8 Date : 21/10/20 Time : 11.50 am	W9 Date : 21/10/20 Time : 12.40 pm	W14 Date : 21/10/20 Time : 2.30 pm
Silver (as Ag), mg/L *(Method : APHA 3030 F & 3111 B, 2017)*	<0.02	<0.02	<0.02	<0.02
Tin (as Sn), mg/L *(Method : In-House Method 0502 based on APHA 3111 D, 2017)*	<0.03	<0.03	<0.03	<0.03
Selenium (as Se), mg/L *(Method : APHA 3114 C, 2017)*	<0.002	<0.002	<0.002	<0.002
Arsenic (as As), mg/L *(Method : APHA 3114 B & C, 2017)*	<0.006	<0.006	<0.006	<0.006
Aluminium (as Al), mg/L *(Method : APHA 3030 F & 3111 D, 2017)*	2.30	0.15	0.11	2.89
Barium (as Ba), mg/L *(Method : APHA 3030 F & 3111 D, 2017)*	0.01	<0.01	<0.01	<0.01

----------End----------

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MMIC (2747/5242/08/08)
SENIOR CHEMIST

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Customer	:	Sarawak Energy Berhad Menara Sarawak Energy Level 6, No.1, The Isthmus 93050 Kuching Sarawak	Lab No.	:	CK/CL105/132285/20
			Type (No.) of Sample	:	Surface Water (3)
			Date Received	:	23rd October 2020
			Date of Report	:	10th November 2020
			Project Code	:	CK/EV103/792/20

Lab No.	132285-1	132285-2	132285-3
Parameter (s)	W21 Date : 22/10/20 Time : 12.40 pm	W22 Date : 22/10/20 Time : 11.55 am	W23 Date : 22/10/20 Time : 11.20 am
Lead (as Pb), mg/L *(Method : APHA 3030 F & APHA 3111 B, 2017)*	<0.01	<0.01	<0.01
Copper (as Cu), mg/L *(Method : APHA 3030 F & APHA 3111 B, 2017)*	<0.02	<0.02	<0.02
Zinc (as Zn), mg/L *(Method : APHA 3030 F & APHA 3111 B, 2017)*	0.02	<0.02	0.02
Nickel (as Ni), mg/L *(Method : APHA 3030 F & APHA 3111 B, 2017)*	<0.02	<0.02	<0.02
Cadmium (as Cd), mg/L *(Method : APHA 3030 F & APHA 3111 B, 2017)*	<0.002	<0.002	<0.002
Chromium, Hexavalent (as Cr^{6+}), mg/L *(Method : APHA 3500 Cr B, 2017)*	<0.02	<0.02	<0.02
Chromium, Trivalent (as Cr^{3+}), mg/L *(Method : In House Method 0508 based on APHA 3500 Cr B, 1998)*	<0.02	<0.02	<0.02
Iron (as Fe), mg/L *(Method : APHA 3030 F & APHA 3111 B, 2017)*	0.16	0.07	1.28
Manganese (as Mn), mg/L *(Method : APHA 3030 F & APHA 3111 B, 2017)*	<0.02	<0.02	<0.02
Mercury (as Hg), mg/L *(Method : In House Method 0535 based on APHA 3112 B, 2017)*	<0.001	<0.001	<0.001

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Lab No: CK/CL105/132285/20

Lab No.	132285-1	132285-2	132285-3
Parameter (s)	W21 Date : 22/10/20 Time : 12.40 pm	W22 Date : 22/10/20 Time : 11.55 am	W23 Date : 22/10/20 Time : 11.20 am
Silver (as Ag), mg/L *(Method : APHA 3030 F & APHA 3111 B, 2017)*	<0.02	<0.02	<0.02
Tin (as Sn), mg/L *(Method : In-House Method 0502 based on APHA 3111 D, 2017)*	<0.03	<0.03	<0.03
Arsenic (as As), mg/L *(Method : APHA 3114 B & C, 2017)*	<0.006	<0.006	<0.006
Aluminium (as Al), mg/L *(Method : APHA 3030 F & APHA 3111 D, 2017)*	0.16	0.06	0.85
Barium (as Ba), mg/L *(Method : APHA 3030 F & APHA 3111 D, 2017)*	<0.01	<0.01	<0.01
Selenium (as Se), mg/L *(Method : APHA 3114 C, 2017)*	<0.002	<0.002	<0.002

----------End----------

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Appendix 5.8.4a

Water Quality Average Data From 2016 To 2020
(JBALB)

WATER QUALITY AVERAGE DATA FROM 2016 TO 2020 (DAP WIP)

Parameters	Year				
	2016	2017	2018	2019	2020
Temperature, °C	-	-	-	-	-
pH Value	6.4	6.5	6.4	8.0	8.7
Dissolved Oxygen, mg/L	-	-	-	-	-
Turbidity (NTU)	-	-	80	110	150
Biochemical Oxygen Demand, mg/L	2	2	2	2	2
Chemical Oxygen Demand, mg/L	11	6	6	6	6
Total Suspended Solids, mg/L (TSS)	-	-	-	-	-
Total Dissolved Solids, mg/L (TDS)	15.33	17.00	-	-	-
Ammoniacal Nitrogen (as N), mg/L	0.1182	0.1273	0.1000	0.1000	0.1000
Lead (as Pb), mg/L	0.006	0.001	-	0.001	0.002
Copper (as Cu), mg/L	0.0077	0.0015	-	0.0010	0.0010
Zinc (as Zn), mg/L	0.0493	0.0038	-	0.0050	0.0020
Cadmium (as Cd), mg/L	0.0002	0.00015	-	0.0001	0.0001
Chromium (Cr), mg/L	0.0220	0.0010	-	0.0010	0.0010
Iron (as Fe), mg/L	1.5600	0.5400	0.3250	0.1822	0.1575
Manganese (as Mn), mg/L	0.1700	0.0262	0.0073	0.0017	0.0016
Mercury (as Hg), mg/L	0.001	0.000775	-	0.0001	0.0001
Silver (as Ag), mg/L	0.0020	0.0015	-	0.0010	0.0010
Selenium (as Se), mg/L	0.0010	0.0010	-	0.0010	0.0010
Arsenic (as As), mg/L	0.0010	0.0010	-	0.0010	0.0010
Aluminium (as Al), mg/L	0.5018	0.2889	0.2600	0.1089	0.2000

WATER QUALITY AVERAGE DATA FROM 2016 TO 2020 (KANOWIT WIP)

Parameters	Year				
	2016	2017	2018	2019	2020
Temperature, °C	-	-	-	-	-
pH Value	6.4	6.3	6.3	6.4	6.3
Dissolved Oxygen, mg/L	-	-	-	-	-
Turbidity (NTU)	66.0	-	-	73.4	91.0
Biochemical Oxygen Demand, mg/L	2.00	2.00	2.00	2.11	2.00
Chemical Oxygen Demand, mg/L	10.40	6.36	18.25	30.89	6.33
Total Suspended Solids, mg/L (TSS)	-	-	-	-	-
Total Dissolved Solids, mg/L (TDS)	33.2	-	-	-	22.0
Ammoniacal Nitrogen (as N), mg/L	0.1000	0.1182	0.1000	0.1000	0.1067
Lead (as Pb), mg/L	0.0020	0.0010	-	0.0010	0.0010
Copper (as Cu), mg/L	0.0110	0.0027	-	0.0060	0.0020
Zinc (as Zn), mg/L	0.0240	0.0033	-	0.0080	0.0060
Cadmium (as Cd), mg/L	0.0002	0.0001	-	0.0001	0.0001
Chromium (Cr), mg/L	0.0027	0.0010	-	0.0010	0.0010
Iron (as Fe), mg/L	0.7656	0.4140	0.3533	0.2756	0.2840
Manganese (as Mn), mg/L	0.0420	0.0115	0.0077	0.0030	0.0013
Mercury (as Hg), mg/L	0.0010	0.0007	-	0.0001	0.0001
Silver (as Ag), mg/L	0.0020	0.0010	-	0.0010	0.0010
Selenium (as Se), mg/L	0.0010	0.0010	-	0.0010	0.0010
Arsenic (as As), mg/L	0.0010	0.0010	-	0.0010	0.0010
Aluminium (as Al), mg/L	0.1860	0.1260	0.1167	0.0967	0.1117

WATER QUALITY AVERAGE DATA FROM 2016 TO 2020 (KAPIT WIP)

Parameters	Year				
	2016	2017	2018	2019	2020
Temperature, °C	-	-	-	-	-
pH Value	6.9	6.7	6.8	6.8	6.7
Dissolved Oxygen, mg/L	-	-	-	-	-
Turbidity (NTU)	311.64	469.13	373.60	311.11	384.55
Biochemical Oxygen Demand, mg/L	2.00	2.09	2.00	2.13	2.00
Chemical Oxygen Demand, mg/L	19.08	6.00	15.60	5.75	6.33
Total Suspended Solids, mg/L (TSS)	-	-	-	-	-
Total Dissolved Solids, mg/L (TDS)	19.00	18.45	16.00	17.88	45.33
Ammoniacal Nitrogen (as N), mg/L	0.1000	0.1000	0.1000	0.1000	0.1183
Lead (as Pb), mg/L	0.0063	0.0013	-	0.0010	0.0010
Copper (as Cu), mg/L	0.0115	0.0037	-	0.0010	0.0010
Zinc (as Zn), mg/L	0.0498	0.0253	-	0.0010	0.0010
Cadmium (as Cd), mg/L	0.0003	0.0002	-	0.0001	0.0001
Chromium (Cr), mg/L	0.0055	0.0023	-	0.0010	0.0010
Iron (as Fe), mg/L	1.3236	0.6418	0.3675	0.2067	0.1133
Manganese (as Mn), mg/L	0.1908	0.0435	0.0065	0.0011	0.0010
Mercury (as Hg), mg/L	0.0010	0.0007	-	0.0001	0.0001
Silver (as Ag), mg/L	0.0020	0.0020	-	0.0010	0.0010
Selenium (as Se), mg/L	0.0010	0.0010	-	0.0010	0.0010
Arsenic (as As), mg/L	0.0010	0.0010	-	0.0010	0.0010
Aluminium (as Al), mg/L	0.5275	0.3218	0.3175	0.1522	0.0640

WATER QUALITY AVERAGE DATA FROM 2016 TO 2020 (SONG WIP)

Parameters	Year				
	2016	2017	2018	2019	2020
Temperature, °C	-	-	-	-	-
pH Value	-	-	-	7.4	-
Dissolved Oxygen, mg/L	-	-	-	-	-
Turbidity (NTU)	103.16	122.68	34.44	31.24	116.94
Biochemical Oxygen Demand, mg/L	2.00	2.09	2.00	2.00	2.00
Chemical Oxygen Demand, mg/L	21.42	6.00	13.00	8.30	6.50
Total Suspended Solids, mg/L (TSS)	-	-	-	-	-
Total Dissolved Solids, mg/L (TDS)	20.83	18.73	21.60	25.70	21.00
Ammoniacal Nitrogen (as N), mg/L	0.1000	0.1000	0.1000	0.1000	0.0880
Lead (as Pb), mg/L	0.0015	0.0033	-	0.0010	-
Copper (as Cu), mg/L	0.0023	0.0030	-	0.0010	-
Zinc (as Zn), mg/L	0.0443	0.0573	-	0.0010	-
Cadmium (as Cd), mg/L	0.0002	0.0002	-	0.0001	-
Chromium (Cr), mg/L	0.0093	0.0020	-	0.0010	-
Iron (as Fe), mg/L	0.8191	0.3156	0.2375	0.0878	0.0500
Manganese (as Mn), mg/L	0.1275	0.0662	0.0428	0.0010	0.0036
Mercury (as Hg), mg/L	0.0010	0.0007	-	0.0001	-
Silver (as Ag), mg/L	0.0020	0.0020	-	0.0010	-
Selenium (as Se), mg/L	0.0010	0.0010	-	0.0010	-
Arsenic (as As), mg/L	0.0010	0.0010	-	0.0010	-
Aluminium (as Al), mg/L	0.2325	0.1622	0.1025	0.0156	0.0380

WATER QUALITY AVERAGE DATA FROM 2016 TO 2020 (ENTAWAU WIP)

Parameters	Year				
	2016	2017	2018	2019	2020
Temperature, °C	-	-	-	-	-
pH Value	6.3	6.0	6.2	6.2	6.1
Dissolved Oxygen, mg/L	-	-	-	-	-
Turbidity (NTU)	363.64	445.45	270.00	353.00	430.00
Biochemical Oxygen Demand, mg/L	2.00	2.10	2.00	2.00	2.00
Chemical Oxygen Demand, mg/L	13.64	6.00	13.20	6.00	6.00
Total Suspended Solids, mg/L (TSS)	-	-	-	-	-
Total Dissolved Solids, mg/L (TDS)	17.09	14.00	17.60	18.00	21.25
Ammoniacal Nitrogen (as N), mg/L	0.1000	0.1000	0.1000	0.1000	0.1000
Lead (as Pb), mg/L	0.0028	0.0013	-	0.0010	0.0010
Copper (as Cu), mg/L	0.0040	0.0013	-	0.0010	0.0010
Zinc (as Zn), mg/L	0.0400	0.0140	-	0.0010	0.0420
Cadmium (as Cd), mg/L	0.0002	0.0002	-	0.0001	0.0001
Chromium (Cr), mg/L	0.0043	0.0023	-	0.0010	0.0010
Iron (as Fe), mg/L	0.5800	0.4209	0.1475	0.1540	0.1100
Manganese (as Mn), mg/L	0.0736	0.0760	0.0040	0.0055	0.0046
Mercury (as Hg), mg/L	0.0010	0.0007	-	0.0001	0.0001
Silver (as Ag), mg/L	0.0020	0.0020	-	0.0010	0.0010
Selenium (as Se), mg/L	0.0010	0.0010	-	0.0010	0.0010
Arsenic (as As), mg/L	0.0010	0.0010	-	0.0010	0.0010
Aluminium (as Al), mg/L	0.3082	0.3682	0.0950	0.1350	0.2860

Appendix 5.8.4b

Water Quality Average Data From 2015 To 2019
(NREB)

0495

NATURAL RESOURCES AND ENVIRONMENT BOARD (NREB), SARAWAK

18th - 20th Floor, Menara Pelita, Jalan Tun Abdul Rahman Yakub
Petra Jaya, 93050 Kuching, Sarawak, Malaysia.
Locked Bag No. 2103, Kuching, Sarawak, Malaysia.
Tel: 082-319500/447488 Fax: 082-312800

AJA EQS CERTIFICATION
ISO 9001 : 2015
No. Akreditasi: QS 29072008 CB 08
Cert. No. : AJAMY09/1263
Scope: The Management of Environmental Impact Assessment (EIA) Process (only applicable to NREB Headquarters)

Kuching Office
Shoplot No. 29, Lot 9005, Block 11, Muara Tebas Land District, Jalan Setia Raja, 93350 Kuching
Tel : 082-365972
Fax : 082-365934

Betong Office
Aras UG, Block Menara, Kompleks Pejabat Kerajaan Negeri, Kawasan Bandar Baru Betong, Jalan Spine, 95700 Betong
Tel : 083-471901
Fax : 083-471900

Sibu Office
Tingkat 8, Wisma Sanyan, No. 1, Jalan Sanyan 96000 Sibu
Tel : 084-337428
Fax : 084-327488

Mukah Office
6th Floor, Menara Pehin Setia Raja, 96400 Mukah
Tel : 084-873485
Fax : 084-873488

Bintulu Office
2nd Floor, Wisma Bintulu, Jalan Tanjung Kidurong, 97000 Bintulu
Tel : 086-334448
Fax : 086-335340

Miri Office
9th Floor, Wisma Pelita Tunku, Jalan Puchong, 98000 Miri
Tel : 085-437488
Fax : 085-410254

Limbang Office
3rd Floor, Limbang Plaza, Jalan Buang Siol, 98700 Limbang
Tel : 085-216488
Fax : 085-216486

Ref.: **(122) NREB/1-6/1.21**

5th November 2020

Senior Director,
Chemsain Konsultant Sdn. Bhd.,
172, Rock Road,
93200 Kuching, Sarawak.

(Tel. No.: 082-548 366 Fax No.: 082- 548 388)

Dear Sir,

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY FOR THE PROPOSED BALEH-MAPAI 500 KV TRANSMISSION LINE PROJECT
RE: Request for Water Quality Information

May I refer to your letter dated *Ref. No.*: CK/EV103/792/0595/20 dated 7th October 2020 pertaining to the above matter.

2. As requested, attached are the GPS coordinates and the water quality information from the year 2015 to 2019 along Batang Baleh and Batang Rajang (including its tributaries) from the Baleh Hydroelectric Project until Kanowit town.

3. Kindly be reminded that the use and management of the information and data shall be in accordance with the Guidelines for the Dissemination and Use of Data for External Parties Involved in the Studies or Projects with the Sarawak State Government as in **Appendix A**.

4. Your cooperation on this matter is very much appreciated.

Thank you.

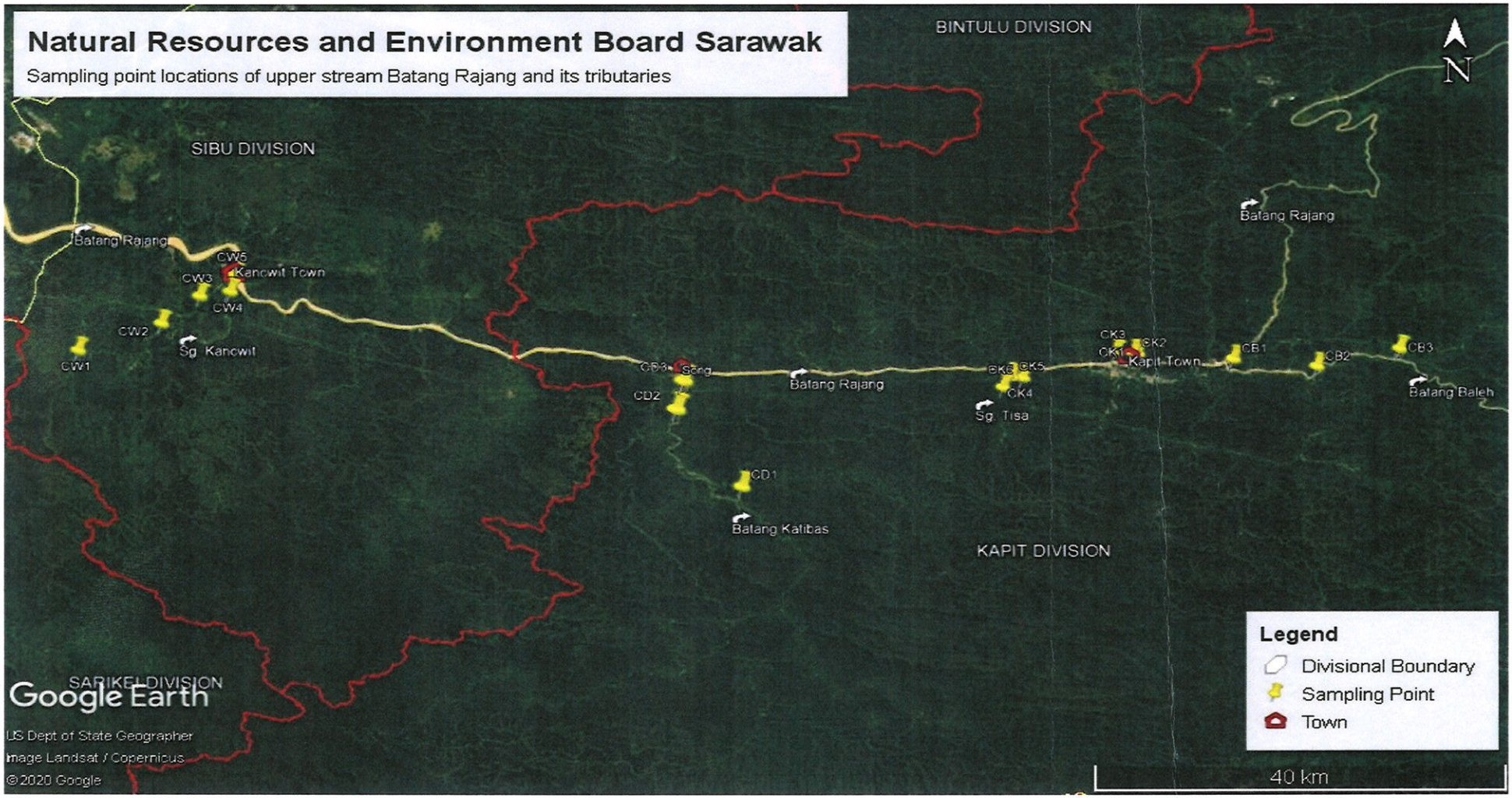
"A CLEAN, GREEN AND HEALTHY SARAWAK"
"AN HONOUR TO SERVE"

(JUSTINE JOK JAU EMANG)
Controller of Environmental Quality
Sarawak.

The Documents was faxed on
Date: 5/11/2020 Initial: .....

WATER QUALITY MONITORING SITES AND FREQUENCY ALONG UPSTREAM BATANG RAJANG AND ITS TRIBUTARIES

	NO	Rivers	Sampling Points	Code	GPS Coordinate	Monitoring Frequency	Total Samples
CENTRAL SIBU	1	Sungai. Kanowit	Machan Bazaar	CW1	N02° 1'16.19" E112° 0'56.25"	Quarterly	5
			Rh. Ato ak Jarup Jetty, Bukong	CW2	N02° 2'55.22" E112° 5'20.60"		
			Rh. Binar Jetty, Sg. Ranan	CW3	N02° 4'33.17" E112° 7'22.64"		
			Confluence of Sg. Ranan	CW4	N02° 4'48.87" E112° 8'59.21"		
			Kanowit JKR Water Intake Point	CW5	N02° 5'48.88" E112° 9'12.13"		
KAPIT	2	Batang Rejang, Kapit	Kapit Water Intake Point	CK1	N02° 01' 4.07"" E112° 56' 40.50"	Bimonthly	3
			Kapit Express Wharf	CK2	N02° 01' 4.78" E112° 56' 27.76"		
			Bleteh Jetty	CK3	N02° 01' 7.77" E112° 55' 31.40"		
	3	Sungai Tisa	Nanga Sg. Tisa	CK4	N01°59'36.09" E112°50'38.52"	Half Yearly	3
			Adjacent to Rh Lulut	CK5	N01°59'41.39" E112°50'1.12"		
			Upstream of other sampling point	CK6	N01°59'1.36" E112°49'36.84"		
	4	Batang Baleh	SK Lepong Baleh	CB 1	N02°00'44.03" E113°1'44.70"	Quarterly	3
			Ng. Serian	CB 2	N02°00'16.95" E113°06'7.46"		
			Ng. Mujong	CB 3	N02°01'20.50" E113°10'29.87"		
	5	Batang Katibas	Banjor Nanga Saoh	CD1	N01°52'57.64" E112°35'53.52"	Quarterly	3
			SK Nanga Nyimoh	CD2	N01°57'32.90" E112°32'25.24"		
			Kampung Sejiran Nanga Tebiau	CD3	N01°59'16.44" E112°32'47.82"		


Natural Resources and Environment Board Sarawak
Sampling point locations of upper stream Batang Rajang and its tributaries
BINTULU DIVISION
SIBU DIVISION
KAPIT DIVISION
SARIKEI DIVISION
N
Batang Rajang
CW5
Kanowit Town
CW3
CW4
CW2
CW1
Sg. Kanowit
CD3
Song
CD2
CD1
Batang Katibas
Batang Rajang
CK6
CK5
CK4
Sg. Tisa
CK3
CK2
CK1
Kapit Town
CB1
CB2
CB3
Batang Baleh
Legend
Divisional Boundary
Sampling Point
Town
40 km
Google Earth
US Dept of State Geographer
Image Landsat / Copernicus
©2020 Google

WATER QUALITY AVERAGE DATA FOR SUNGAI KANOWIT (CW), SIBU DIVISION, SARAWAK FROM 2015 TO 2019

SAMPLING POINT: CW1

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.50	0.68	1.58	0.98	0.30	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.25	2.00	2.25	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	6.50	9.25	26.00	19.25	13.25	mg/L
Conductivity	0.03	0.04	0.04	0.03	0.03	mS/cm
Dissolved oxygen (DO)	5.57	5.62	5.51	5.78	5.67	mg/L
Faecal Coliforms Counts (FCC)	1930	570	1883	5800	1890	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.08	0.08	0.07	0.09	0.24	mg/L
Oxygen Saturation (DO%)	67.65	59.90	63.23	68.38	64.68	%
pH (KCL)	7.04	5.88	5.61	5.33	5.60	Not Applicable
Phosphate (P)	0.10	0.10	0.10	0.10	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	26.58	27.30	28.08	29.03	28.75	°C
Total Coliforms Counts (TCC)	3358	1673	6300	11650	4098	MPN/100mL
Total Suspended Solids (TSS)	10.00	18.00	106.75	105.00	88.50	mg/L
Turbidity	38.45	57.70	129.00	178.25	219.75	NTU

SAMPLING POINT: CW2

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.45	0.40	1.33	0.83	0.38	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.00	2.00	2.02	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	20.75	15.00	12.00	22.00	9.25	mg/L
Conductivity	0.03	0.03	0.04	0.03	0.04	mS/cm
Dissolved oxygen (DO)	5.35	5.71	5.57	6.15	5.55	mg/L
Faecal Coliforms Counts (FCC)	1455	2555	1203	2673	1215	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.13	0.09	0.07	0.10	0.11	mg/L
Oxygen Saturation (DO%)	68.46	63.13	70.23	69.65	61.08	%
pH (KCL)	6.95	5.95	5.86	5.46	5.57	Not Applicable
Phosphate (P)	0.10	0.10	0.10	0.10	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	27.08	27.93	28.53	28.80	28.70	°C
Total Coliforms Counts (TCC)	2883	3648	2950	4375	3448	MPN/100mL
Total Suspended Solids (TSS)	12.75	27.50	121.75	110.50	58.00	mg/L
Turbidity	84.15	30.88	155.25	191.50	245.25	NTU

SAMPLING POINT: CW3

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.55	0.40	1.33	0.53	0.43	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.50	2.00	2.12	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	19.25	8.25	12.75	23.25	11.75	mg/L
Conductivity	0.03	0.04	0.04	0.03	0.03	mS/cm
Dissolved oxygen (DO)	5.60	5.83	6.34	5.71	5.77	mg/L
Faecal Coliforms Counts (FCC)	1655	3258	3173	2558	1655	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.13	0.07	0.03	0.14	0.12	mg/L
Oxygen Saturation (DO%)	68.18	64.36	75.25	68.69	63.08	%
pH (KCL)	7.03	6.06	5.68	5.52	5.37	Not Applicable
Phosphate (P)	0.10	0.10	0.11	0.10	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	26.95	28.00	28.83	28.50	28.78	°C
Total Coliforms Counts (TCC)	5673	5848	8650	3300	4045	MPN/100mL
Total Suspended Solids (TSS)	15.50	63.75	59.25	43.25	181.25	mg/L
Turbidity	88.90	37.10	117.75	183.00	236.25	NTU

SAMPLING POINT: CW4

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.45	0.55	1.25	0.95	0.35	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.50	2.00	2.18	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	6.25	17.25	11.00	27.25	18.00	mg/L
Conductivity	0.03	0.03	0.04	0.03	0.03	mS/cm
Dissolved oxygen (DO)	5.79	5.83	6.24	5.78	5.87	mg/L
Faecal Coliforms Counts (FCC)	1105	1315	4308	2133	955	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.11	0.15	0.06	0.19	0.17	mg/L
Oxygen Saturation (DO%)	65.60	63.75	74.08	69.51	66.70	%
pH (KCL)	6.93	5.77	5.78	5.40	5.56	Not Applicable
Phosphate (P)	0.10	0.10	0.10	0.10	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	27.03	28.35	29.08	28.80	28.68	°C
Total Coliforms Counts (TCC)	2975	5600	9073	4648	4858	MPN/100mL
Total Suspended Solids (TSS)	15.75	158.75	38.75	69.25	221.25	mg/L
Turbidity	83.63	43.55	112.00	183.00	215.50	NTU

SAMPLING POINT: **CD3**

Parameter	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.78	0.25	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	98.75	11.75	mg/L
Conductivity	0.04	0.03	mS/cm
Dissolved oxygen (DO)	7.69	7.07	mg/L
Faecal Coliforms Counts (FCC)	693	2400	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.15	0.09	mg/L
Oxygen Saturation (DO%)	93.15	81.66	%
pH (KCL)	7.15	7.11	Not Applicable
Phosphate (P)	0.13	0.10	mg/L
Salinity	0.00	0.00	ppt
Temperature	27.08	27.70	°C
Total Coliforms Counts (TCC)	3250	8525	MPN/100mL
Total Suspended Solids (TSS)	66.25	78.00	mg/L
Turbidity	31.40	33.03	NTU

Notes:

i) Batang Katibas started monitored on 2018.

WATER QUALITY AVERAGE DATA FOR BATANG RAJANG KAPIT (CK), SIBU DIVISION, SARAWAK FROM 2015 TO 2019

SAMPLING POINT: CK1

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.50	0.47	0.60	0.72	0.45	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.00	2.00	2.02	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	6.00	9.33	9.33	32.67	8.67	mg/L
Conductivity	0.03	0.03	0.03	0.03	0.03	mS/cm
Dissolved oxygen (DO)	5.65	5.92	5.85	6.11	5.46	mg/L
Faecal Coliforms Counts (FCC)	1239	3078	955	6113	333	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.12	0.09	0.09	0.07	0.14	mg/L
Oxygen Saturation (DO%)	61.02	63.22	69.42	67.53	66.17	%
pH (KCL)	6.32	5.86	5.73	5.89	5.59	Not Applicable
Phosphate (P)	0.10	0.15	0.14	0.12	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	28.70	28.80	28.32	27.55	28.27	°C
Total Coliforms Counts (TCC)	1772	3768	3623	6433	1120	MPN/100mL
Total Suspended Solids (TSS)	44.00	112.67	92.33	98.50	121.83	mg/L
Turbidity	115.00	160.40	213.17	160.33	212.93	NTU

SAMPLING POINT: CK2

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.60	0.43	0.65	0.73	0.32	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.00	2.00	2.00	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	6.17	9.67	16.67	34.67	10.33	mg/L
Conductivity	0.03	0.03	0.03	0.03	0.03	mS/cm
Dissolved oxygen (DO)	5.66	6.04	5.71	5.85	5.74	mg/L
Faecal Coliforms Counts (FCC)	1094	830	1347	4770	997	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.16	0.12	0.09	0.08	0.13	mg/L
Oxygen Saturation (DO%)	62.63	65.92	68.68	68.17	67.98	%
pH (KCL)	6.44	6.15	5.71	5.95	5.76	Not Applicable
Phosphate (P)	0.10	0.17	0.14	0.13	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	29.03	28.83	28.48	27.58	28.28	°C
Total Coliforms Counts (TCC)	1643	2055	3710	6465	1838	MPN/100mL
Total Suspended Solids (TSS)	40.67	136.17	72.17	83.17	89.33	mg/L
Turbidity	112.50	158.07	231.00	169.50	252.03	NTU

SAMPLING POINT: CK3

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.50	0.43	0.65	0.57	0.38	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.00	2.00	2.00	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	10.50	9.83	12.83	31.33	8.17	mg/L
Conductivity	0.03	0.03	0.03	0.03	0.03	mS/cm
Dissolved oxygen (DO)	5.83	6.29	5.57	5.86	5.49	mg/L
Faecal Coliforms Counts (FCC)	1102	1897	959	2662	502	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.12	0.14	0.06	0.09	0.12	mg/L
Oxygen Saturation (DO%)	63.65	63.88	63.80	63.88	66.98	%
pH (KCL)	6.44	6.18	5.89	5.97	5.69	Not Applicable
Phosphate (P)	0.10	0.17	0.14	0.12	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	29.05	28.96	28.52	28.05	28.22	°C
Total Coliforms Counts (TCC)	1620	2800	3077	5015	1495	MPN/100mL
Total Suspended Solids (TSS)	38.17	90.17	132.50	95.67	96.83	mg/L
Turbidity	117.83	160.42	233.50	161.17	248.72	NTU

WATER QUALITY AVERAGE DATA FOR SUNGAI TISA (CK), SIBU DIVISION, SARAWAK FROM 2015 TO 2019

SAMPLING POINT: CK4

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.85	0.50	1.10	0.45	0.35	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.00	2.00	2.00	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	8.00	13.50	6.00	14.00	35.00	mg/L
Conductivity	0.03	0.03	0.02	0.03	0.03	mS/cm
Dissolved oxygen (DO)	6.00	6.29	4.96	6.12	5.86	mg/L
Faecal Coliforms Counts (FCC)	396	280	2815	230	1445	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.21	0.04	0.15	0.22	0.07	mg/L
Oxygen Saturation (DO%)	65.60	66.80	70.30	72.35	66.80	%
pH (KCL)	6.60	6.62	6.27	5.84	5.34	Not Applicable
Phosphate (P)	0.10	0.10	0.12	0.10	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	28.80	28.15	26.50	26.65	27.10	°C
Total Coliforms Counts (TCC)	396	585	12600	515	8650	MPN/100mL
Total Suspended Solids (TSS)	9.50	7.50	48.50	10.50	255.00	mg/L
Turbidity	19.50	14.15	105.00	29.15	33.15	NTU

SAMPLING POINT: CK5

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.85	0.50	1.10	0.40	0.35	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.00	2.00	2.00	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	8.00	20.00	6.50	12.00	15.50	mg/L
Conductivity	0.03	0.03	0.02	0.03	0.03	mS/cm
Dissolved oxygen (DO)	6.10	6.44	6.50	6.64	5.80	mg/L
Faecal Coliforms Counts (FCC)	246	280	3050	510	1365	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.10	0.08	0.17	0.16	0.06	mg/L
Oxygen Saturation (DO%)	65.70	69.00	70.45	67.95	67.95	%
pH (KCL)	6.72	6.81	6.38	6.41	5.72	Not Applicable
Phosphate (P)	0.10	0.10	0.12	0.10	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	29.25	28.70	26.25	27.45	26.70	°C
Total Coliforms Counts (TCC)	246	745	9200	1350	4995	MPN/100mL
Total Suspended Solids (TSS)	11.00	6.50	39.00	7.00	168.50	mg/L
Turbidity	10.81	8.70	96.00	33.40	38.60	NTU

SAMPLING POINT: CK6

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.60	0.50	0.75	0.40	0.40	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.00	2.00	2.00	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	7.00	10.50	7.50	17.50	11.50	mg/L
Conductivity	0.03	0.03	0.02	0.03	0.03	mS/cm
Dissolved oxygen (DO)	6.20	6.56	6.59	6.48	5.66	mg/L
Faecal Coliforms Counts (FCC)	551	230	2855	490	1315	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.06	0.02	0.17	0.15	0.07	mg/L
Oxygen Saturation (DO%)	66.95	69.55	71.40	67.30	70.55	%
pH (KCL)	6.88	6.84	5.91	5.98	5.89	Not Applicable
Phosphate (P)	0.10	0.10	0.11	0.10	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	29.30	28.95	26.85	26.10	27.45	°C
Total Coliforms Counts (TCC)	701	330	12600	2600	8245	MPN/100mL
Total Suspended Solids (TSS)	7.00	5.00	49.00	8.50	120.50	mg/L
Turbidity	10.15	7.05	83.50	28.20	36.25	NTU

WATER QUALITY AVERAGE DATA FOR BATANG BALEH (CB), SIBU DIVISION, SARAWAK FROM 2015 TO 2019

SAMPLING POINT: CB1

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.50	0.40	0.75	0.55	0.63	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.00	2.00	2.03	2.08	2.00	mg/L
Chemical Oxygen Demand (COD)	7.50	12.25	12.00	29.50	24.00	mg/L
Conductivity	0.03	0.03	0.03	0.03	0.03	mS/cm
Dissolved oxygen (DO)	5.52	3.86	5.26	5.17	5.04	mg/L
Faecal Coliforms Counts (FCC)	388	1348	863	2780	3005	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.19	0.14	0.16	0.08	0.16	mg/L
Oxygen Saturation (DO%)	59.18	45.74	61.84	52.58	60.18	%
pH (KCL)	6.12	6.07	5.39	5.53	5.67	Not Applicable
Phosphate (P)	0.12	0.10	0.18	0.10	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	28.75	28.33	27.68	27.63	27.83	°C
Total Coliforms Counts (TCC)	948	2190	1920	3970	5900	MPN/100mL
Total Suspended Solids (TSS)	45.25	90.50	51.75	110.50	271.50	mg/L
Turbidity	107.75	212.50	320.00	289.85	356.00	NTU

SAMPLING POINT: CB2

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.50	0.45	1.03	0.58	0.44	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.00	2.00	2.00	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	6.75	9.50	11.50	28.50	18.00	mg/L
Conductivity	0.03	0.03	0.03	0.03	0.03	mS/cm
Dissolved oxygen (DO)	5.63	4.21	5.50	5.14	4.99	mg/L
Faecal Coliforms Counts (FCC)	703	1315	863	2505	1733	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.21	0.14	0.13	0.07	0.16	mg/L
Oxygen Saturation (DO%)	62.65	48.73	63.53	64.64	61.05	%
pH (KCL)	6.23	6.13	5.71	5.66	5.49	Not Applicable
Phosphate (P)	0.12	0.10	0.18	0.10	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	29.08	28.33	27.75	27.40	27.43	°C
Total Coliforms Counts (TCC)	5233	3130	1055	5598	6825	MPN/100mL
Total Suspended Solids (TSS)	37.00	101.00	76.75	93.25	542.25	mg/L
Turbidity	105.25	228.53	326.50	284.83	400.25	NTU

SAMPLING POINT: CB3

Parameter	2015	2016	2017	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.50	0.40	0.58	0.43	0.38	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.00	2.00	2.00	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	7.50	8.50	9.75	32.00	17.00	mg/L
Conductivity	0.03	0.03	0.03	0.03	0.03	mS/cm
Dissolved oxygen (DO)	5.76	4.34	5.83	5.67	5.45	mg/L
Faecal Coliforms Counts (FCC)	1380	1448	1598	1705	2350	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.20	0.13	0.14	0.08	0.15	mg/L
Oxygen Saturation (DO%)	65.88	50.35	68.14	66.40	63.10	%
pH (KCL)	6.34	6.27	5.94	5.89	5.55	Not Applicable
Phosphate (P)	0.11	0.10	0.18	0.10	0.10	mg/L
Salinity	0.00	0.00	0.00	0.00	0.00	ppt
Temperature	29.30	28.20	28.05	27.95	27.65	°C
Total Coliforms Counts (TCC)	2158	2698	4663	4790	7300	MPN/100mL
Total Suspended Solids (TSS)	37.00	88.50	77.75	106.75	275.75	mg/L
Turbidity	108.50	267.80	355.75	328.93	414.25	NTU

WATER QUALITY AVERAGE DATA FOR BATANG KATIBAS (CD), SIBU DIVISION, SARAWAK FROM 2018 TO 2019

SAMPLING POINT: CD1

Parameter	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.55	0.98	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.00	2.00	mg/L
Chemical Oxygen Demand (COD)	90.25	19.75	mg/L
Conductivity	0.03	0.03	mS/cm
Dissolved oxygen (DO)	7.48	6.93	mg/L
Faecal Coliforms Counts (FCC)	1360	1655	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.10	0.04	mg/L
Oxygen Saturation (DO%)	91.70	81.47	%
pH (KCL)	6.72	6.71	Not Applicable
Phosphate (P)	0.13	0.10	mg/L
Salinity	0.00	0.00	ppt
Temperature	27.10	27.85	°C
Total Coliforms Counts (TCC)	2925	7325	MPN/100mL
Total Suspended Solids (TSS)	96.75	46.00	mg/L
Turbidity	27.75	32.13	NTU

SAMPLING POINT: CD2

Parameter	2018	2019	Unit
Ammoniacal Nitrogen (as NH4-N)	0.75	0.25	mg/L
Biochemical Oxygen Demand 5 days (BOD5)	2.25	2.00	mg/L
Chemical Oxygen Demand (COD)	96.75	17.75	mg/L
Conductivity	0.03	0.03	mS/cm
Dissolved oxygen (DO)	7.39	6.99	mg/L
Faecal Coliforms Counts (FCC)	1303	2608	MPN/100mL
Nitrate Nitrogen (NO3-N)	0.15	0.11	mg/L
Oxygen Saturation (DO%)	91.60	81.18	%
pH (KCL)	7.07	6.94	Not Applicable
Phosphate (P)	0.13	0.10	mg/L
Salinity	0.00	0.00	ppt
Temperature	27.08	27.80	°C
Total Coliforms Counts (TCC)	5375	7500	MPN/100mL
Total Suspended Solids (TSS)	88.75	56.75	mg/L
Turbidity	29.13	35.00	NTU

Appendix 5.9.1

$PM_{2.5}$ and PM_{10} (Ambient Air Measurement Report)

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PM2.5 MEASUREMENT REPORT

Measurement Details
Client : Sarawak Energy Bhd
Project Code : CK/EV103 - 7792/2020
Location : A1
Date of Measurement : 1.Dec.2020 to 2.Dec.2020
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5002-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM2.5, µg/m3
A1	1.12.2020 -2.12.2020	9:10:00	9:10:00	24.0	1.15

aeroqual

PM2.5 MEASUREMENT REPORT

Measurement Details					
Client :Sarawak Energy Bhd					
Project Code : CK/EV103 - 7 792/2020					
Location : A2					
Date of Measurement : 2.Dec.2020 to 3.Dec.2020.					
Instrument Details					
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)					
Duration : 24 Hours					
Measurement Data					
No. of Measurement : 1 Point					
Monitoring Location	**Date**	**Time Start (hh:mm:ss)**	**Time Stop (hh:mm:ss)**	**Run Duration (hr)**	**PM2.5, µg/m3**
A2	2.12.2020 to 3.12.2020	12:10:00	12:10:00	24.0	1.59

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PM2.5 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A3
Date of Measurement : 3.Dec.2020 to 4.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM2.5, µg/m3
A3	3.12.2020 to 4.12.2020	13:30:00	13:30:00	24.0	1.87

aeroqual

PM2.5 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A4
Date of Measurement : 6.Dec.2020 to 7.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM2.5, µg/m3
A4	6.12.2020 to 7.12.2020	8:45:00	8:45:00	24.0	0.54

aeroqual

PM2.5 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A5
Date of Measurement : 4.Dec.2020 to 5.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM2.5, µg/m3
A5	4.12.2020 to 5.12.2020	15:45:00	15:45:00	24.0	1.10

aeroqual

PM2.5 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A6
Date of Measurement : 7.Dec.2020 to 8.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM2.5, µg/m3
A6	7.12.2020 to 8.12.2020	11:33:00	11:33:00	24.0	1.33

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PM2.5 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A7
Date of Measurement : 8.Dec.2020 to 9.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM2.5, µg/m3
A7	8.12.2020 to 9.12.2020	13:39:00	13:39:00	24.0	1.00

aeroqual

PM2.5 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7792/2020
Location : A8
Date of Measurement : 18.Dec.2020 to 19.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM2.5, µg/m3
A8	18.12.2020 to 19.12.2020	15:24:00	15:24:00	24.0	1.03

aeroqual

PM2.5 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7792/2020
Location : A9
Date of Measurement : 17.Dec.2020 to 18.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM2.5, µg/m3
A9	17.12.2020 to 18.12.2020	13:28:00	13:28:00	24.0	0.63

aeroqual

PM2.5 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7792/2020
Location : A10
Date of Measurement : 16.Dec.2020 to 17.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM2.5, µg/m3
A10	16.12.2020 to 17.12.2020	12:47:00	12:47:00	24.0	0.65

aeroqual

PM10 MEASUREMENT REPORT

Measurement Details
Client : Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A1
Date of Measurement : 1.Dec.2020 to 2.Dec 2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5002-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM10, µg/m3
A1	1.12.2020 - 2.12.2020	9:10:00	9:10:00	24.0	2.07

aeroqual

PM10 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A2
Date of Measurement : 2.Dec.2020 to 3.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM10, µg/m3
A2	2.12.2020 to 3.12.2020	12:10:00	12:10:00	24.0	3.98

aeroqual

PM10 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A3
Date of Measurement : 3.Dec.2020 to 4.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM10, µg/m3
A3	3.12.2020 to 4.12.2020	13:30:00	13:30:00	24.0	3.70

aeroqual

PM10 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A4
Date of Measurement : 6.Dec.2020 to 7.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM10, µg/m3
A4	6.12.2020 to 7.12.2020	8:45:00	8:45:00	24.0	4.01

aeroqual

PM10 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A5
Date of Measurement : 4.Dec.2020 to 5.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM10, µg/m3
A5	4.12.2020 to 5.12.2020	15:45:00	15:45:00	24.0	2.75

aeroqual

PM10 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A6
Date of Measurement : 7.Dec.2020 to 8.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM10, µg/m3
A6	7.12.2020 to 8.12.2020	11:33:00	11:33:00	24.0	3.43

aeroqual

PM10 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A7
Date of Measurement : 8.Dec.2020 to 9.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM10, µg/m3
A7	8.12.2020 to 9.12.2020	13:39:00	13:39:00	24.0	3.16

aeroqual

PM10 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7792/2020
Location : A8
Date of Measurement : 18.Dec.2020 to 19.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM10, µg/m3
A8	18.12.2020 to 19.12.2020	15:24:00	15:24:00	24.0	4.13

aeroqual

PM10 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7792/2020
Location : A9
Date of Measurement : 17.Dec.2020 to 18.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM10, µg/m3
A9	17.12.2020 to 18.12.2020	13:28:00	13:28:00	24.0	3.66

aeroqual

PM10 MEASUREMENT REPORT

Measurement Details
Client :Sarawak Energy Bhd
Project Code : CK/EV103 - 7 792/2020
Location : A10
Date of Measurement : 16.Dec.2020 to 17.Dec.2020.
Instrument Details
Meter Model : Aeroqual Series 500 - Portable Air Quality Monitor (S/N : 5003-61A7-001)
Duration : 24 Hours
Measurement Data
No. of Measurement : 1 Point

Monitoring Location	Date	Time Start (hh:mm:ss)	Time Stop (hh:mm:ss)	Run Duration (hr)	PM10, µg/m3
A10	16.12.2020 to 17.12.2020	12:47:00	12:47:00	24.0	3.15

Appendix 5.9.2

Malaysian Ambient Air Quality Standard (MAAQS) - BI, 2013

New Malaysia Ambient Air Quality Standard

New Ambient Air Quality Standard was established in order to replace the older Malaysia Ambient Air Quality Guideline that has been used since 1989.

The New Ambient Air Quality Standard adopts 6 air pollutants criteria that include 5 existing air pollutants which are particulate matter with the size of less than 10 micron (PM_{10}), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), and ground level ozone (O_3) as well as 1 additional parameter which is particulate matter with the size of less than 2.5 micron ($PM_{2.5}$).

The air pollutants concentration limit will be strengthen in stages until 2020. There are 3 interim targets set which include interim target 1 (IT-1) in 2015, interim target 2 (IT-2) in 2018 and the full implementation of the standard in 2020.

Table 1 : New Malaysia Ambient Air Quality Standard

Pollutants	Averaging Time	Ambient Air Quality Standard		
		IT-1 (2015)	**IT-2 (2018)**	**Standard (2020)**
		µg/m³	**µg/m³**	**µg/m³**
Particulate Matter with the size of less than 10 micron (PM_{10})	1 Year	50	45	40
	24 Hour	150	120	100
Particulate Matter with the size of less than 2.5 micron ($PM_{2.5}$)	1 Year	35	25	15
	24 Hour	75	50	35
Sulfur Dioxide (SO_2)	1 Hour	350	300	250
	24 Hour	105	90	80
Nitrogen Dioxide (NO_2)	1 Hour	320	300	280
	24 Hour	75	75	70
Ground Level Ozone (O_3)	1 Hour	200	200	180
	8 Hour	120	120	100
***Carbon Monoxide (CO)**	1 Hour	35	35	30
	8 Hour	10	10	10

*mg/m³

Source: Department of Environment (DOE) Malaysia, 2013
http://www.doe.gov.my/portalv1/wp-content/uploads/2013/01/Air-Quality-Standard-BI.pdf

Appendix 5.9.3

WHO Air Quality Guidelines Global Update 2005

WORLD HEALTH ORGANIZATION
EUROPE

Air Quality Guidelines

Global Update 2005

Particulate matter, ozone, nitrogen dioxide and sulfur dioxide

Table 7. Air quality guideline and interim targets for PM: 24-hour mean

24-hour mean level [a]	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	Basis for the selected level
WHO interim target 1 (IT-1)	150	75	Based on published risk coefficients from multicentre studies and meta-analyses (about 5% increase in short-term mortality over AQG)
WHO interim target 2 (IT-2)	100	50	Based on published risk coefficients from multicentre studies and meta-analyses (about 2.5% increase in short-term mortality over AQG)
WHO interim target 3 (IT-3) [b]	75	37.5	About 1.2% increase in short-term mortality over AQG
WHO air quality guidelines (AQG)	50	25	Based on relation between 24-hour and annual PM levels

[a] 99th percentile (3 days/year).
[b] For management purposes, based on annual average guideline values, the precise number to be determined on the basis of local frequency distribution of daily means.

Appendix 5.10.1

Noise Monitoring Test Report

CHEMSAIN KONSULTANT SDN BHD *(130904-U)*
172 Rock Road, 93200 Kuching, Sarawak, Malaysia.
Tel: +06-82-548366 **Fax:** +60-82-548388 / 548399
Email: laboratory@chemsain.com
www.chemsain.com

TEST REPORT

NOT FOR ADVERTISEMENT PURPOSES

Customer : Sarawak Energy Berhad
No. 1, Wisma SEB, The Isthmus,
93050 Kuching, Sarawak.

Lab No. : CK/CL105/133483/20
Type (No.) of Sample : Ambient Noise (7)
Date Received : 14th December 2020
Date of Report : 30th December 2020
Project Code : CK/EV103-792/20

Ambient Noise *(Method: ISO 1996-1:2003 & ISO 1996-2:2007)*		N1
Daytime Date: 01/12/2020 Time: 1000 – 1100 hrs	L_{Aeq}, dB(A)	51.8
	L_{min}, dB(A)	38.5
	L_{max}, dB(A)	70.3
	L_{10}, dB(A)	52.3
	L_{90}, dB(A)	42.3
Night-time Date: 01/12/2020 Time: 2100 – 2200 hrs	L_{Aeq}, dB(A)	42.3
	L_{min}, dB(A)	38.9
	L_{max}, dB(A)	49.6
	L_{10}, dB(A)	43.4
	L_{90}, dB(A)	40.8

NOTE: 1) This Test Report shall not be reproduced, except in full, without the written approval of the laboratory.
2) The above result(s) are based on sample(s) as received.
3) The result(s) relates to the sample(s) tested.

CHEMSAIN KONSULTANT SDN BHD *(130904-U)*
172 Rock Road, 93200 Kuching, Sarawak, Malaysia.
Tel: +06-82-548366 **Fax:** +60-82-548388 / 548399
Email: laboratory@chemsain.com
www.chemsain.com

TEST REPORT

NOT FOR ADVERTISEMENT PURPOSES

Lab No. : CK/CL105/133483/20

Ambient Noise *(Method: ISO 1996-1:2003 & ISO 1996-2:2007)*		N2
Daytime Date: 02/12/2020 Time: 1300 – 1400 hrs	L_{Aeq}, dB(A)	53.7
	L_{min}, dB(A)	33.0
	L_{max}, dB(A)	70.6
	L_{10}, dB(A)	57.8
	L_{90}, dB(A)	37.7
Night-time Date: 02/12/2020 Time: 2100 – 2200 hrs	L_{Aeq}, dB(A)	65.2
	L_{min}, dB(A)	42.7
	L_{max}, dB(A)	79.7
	L_{10}, dB(A)	68.6
	L_{90}, dB(A)	52.8

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TEST REPORT

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Lab No. : CK/CL105/133483/20

Ambient Noise *(Method: ISO 1996-1:2003 & ISO 1996-2:2007)*		N3
Daytime Date: 04/12/2020 Time: 0900 – 1000 hrs	L_{Aeq}, dB(A)	50.0
	L_{min}, dB(A)	45.4
	L_{max}, dB(A)	66.3
	L_{10}, dB(A)	52.3
	L_{90}, dB(A)	46.9
Night-time Date: 04/12/2020 Time: 2104 – 2204 hrs	L_{Aeq}, dB(A)	49.4
	L_{min}, dB(A)	44.7
	L_{max}, dB(A)	73.0
	L_{10}, dB(A)	51.2
	L_{90}, dB(A)	45.6

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TEST REPORT

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Lab No. : CK/CL105/133483/20

Ambient Noise *(Method: ISO 1996-1:2003 & ISO 1996-2:2007)*		N4
Daytime Date: 06/12/2020 Time: 1036 – 1136 hrs	L_{Aeq}, dB(A)	50.2
	L_{min}, dB(A)	40.2
	L_{max}, dB(A)	78.4
	L_{10}, dB(A)	52.6
	L_{90}, dB(A)	43.1
Night-time Date: 06/12/2020 Time: 2111 – 2211 hrs	L_{Aeq}, dB(A)	48.9
	L_{min}, dB(A)	44.3
	L_{max}, dB(A)	74.1
	L_{10}, dB(A)	50.3
	L_{90}, dB(A)	45.6

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TEST REPORT

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Lab No. : CK/CL105/133483/20

Ambient Noise *(Method: ISO 1996-1:2003 & ISO 1996-2:2007)*		N5
Daytime Date: 04/12/2020 Time: 1600 – 1700 hrs	L_{Aeq}, dB(A)	45.1
	L_{min}, dB(A)	34.2
	L_{max}, dB(A)	68.9
	L_{10}, dB(A)	46.7
	L_{90}, dB(A)	36.6
Night-time Date: 04/12/2020 Time: 2100 – 2200 hrs	L_{Aeq}, dB(A)	45.8
	L_{min}, dB(A)	42.1
	L_{max}, dB(A)	54.7
	L_{10}, dB(A)	47.8
	L_{90}, dB(A)	43.6

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Lab No. : CK/CL105/133483/20

Ambient Noise *(Method: ISO 1996-1:2003 & ISO 1996-2:2007)*		N6
Daytime Date: 07/12/2020 Time: 1400 – 1500 hrs	L_{Aeq}, dB(A)	49.1
	L_{min}, dB(A)	31.4
	L_{max}, dB(A)	85.7
	L_{10}, dB(A)	46.6
	L_{90}, dB(A)	36.8
Night-time Date: 07/12/2020 Time: 2100 – 2200 hrs	L_{Aeq}, dB(A)	47.8
	L_{min}, dB(A)	44.3
	L_{max}, dB(A)	70.4
	L_{10}, dB(A)	48.5
	L_{90}, dB(A)	45.3

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TEST REPORT

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Lab No. : CK/CL105/133483/20

Ambient Noise *(Method: ISO 1996-1:2003 & ISO 1996-2:2007)*		N7
Daytime Date: 08/12/2020 Time: 1415 – 1515 hrs	L_{Aeq}, dB(A)	48.8
	L_{min}, dB(A)	44.3
	L_{max}, dB(A)	69.7
	L_{10}, dB(A)	50.6
	L_{90}, dB(A)	45.4
Night-time Date: 08/12/2020 Time: 2103 – 2203 hrs	L_{Aeq}, dB(A)	48.0
	L_{min}, dB(A)	44.1
	L_{max}, dB(A)	73.3
	L_{10}, dB(A)	48.8
	L_{90}, dB(A)	45.3

----------End----------

CHEMSAIN KONSULTANT SDN. BHD. Laboratory Kuching (130904-U)

.....
LAU SUK ENG
B. Eng. (Hons.) Chemical
ESH EXECUTIVE

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TEST REPORT

NOT FOR ADVERTISEMENT PURPOSES

Customer : Sarawak Energy Berhad
No. 1, Wisma SEB, The Isthmus,
93050 Kuching, Sarawak.

Lab No. : CK/CL105/133610/20
Type (No.) of Sample : Ambient Noise (3)
Date Received : 21st December 2020
Date of Report : 30th December 2020
Project Code : CK/EV103-792/20

Ambient Noise *(Method: ISO 1996-1:2003 & ISO 1996-2:2007)*		N8
Daytime Date: 18/12/2020 Time: 1610 – 1710 hrs	L_{Aeq}, dB(A)	61.7
	L_{min}, dB(A)	39.9
	L_{max}, dB(A)	80.4
	L_{10}, dB(A)	63.2
	L_{90}, dB(A)	46.2
Night-time Date: 18/12/2020 Time: 2026 – 2126 hrs	L_{Aeq}, dB(A)	62.9
	L_{min}, dB(A)	41.9
	L_{max}, dB(A)	82.0
	L_{10}, dB(A)	65.9
	L_{90}, dB(A)	47.3

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Lab No. : CK/CL105/133610/20

Ambient Noise *(Method: ISO 1996-1:2003 & ISO 1996-2:2007)*		N9
Daytime Date: 17/12/2020 Time: 1400 – 1500 hrs	L_{Aeq}, dB(A)	47.2
	L_{min}, dB(A)	41.7
	L_{max}, dB(A)	66.2
	L_{10}, dB(A)	47.4
	L_{90}, dB(A)	43.3
Night-time Date: 17/12/2020 Time: 2100 – 2200 hrs	L_{Aeq}, dB(A)	52.1
	L_{min}, dB(A)	48.9
	L_{max}, dB(A)	64.1
	L_{10}, dB(A)	54.0
	L_{90}, dB(A)	50.0

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TEST REPORT

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Lab No. : CK/CL105/133610/20

Ambient Noise *(Method: ISO 1996-1:2003 & ISO 1996-2:2007)*		N10
Daytime Date: 16/12/2020 Time: 1300 – 1400 hrs	L_{Aeq}, dB(A)	52.4
	L_{min}, dB(A)	43.1
	L_{max}, dB(A)	73.1
	L_{10}, dB(A)	55.3
	L_{90}, dB(A)	46.3
Night-time Date: 16/12/2020 Time: 2100 – 2200 hrs	L_{Aeq}, dB(A)	57.2
	L_{min}, dB(A)	44.8
	L_{max}, dB(A)	64.5
	L_{10}, dB(A)	60.3
	L_{90}, dB(A)	46.5

----------End----------

CHEMSAIN KONSULTANT SDN. BHD. Laboratory Kuching (130904-U)

.....
LAU SUK ENG
B. Eng. (Hons.) Chemical
ESH EXECUTIVE

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Appendix 5.10.1

Noise Monitoring Session Report

Session Report

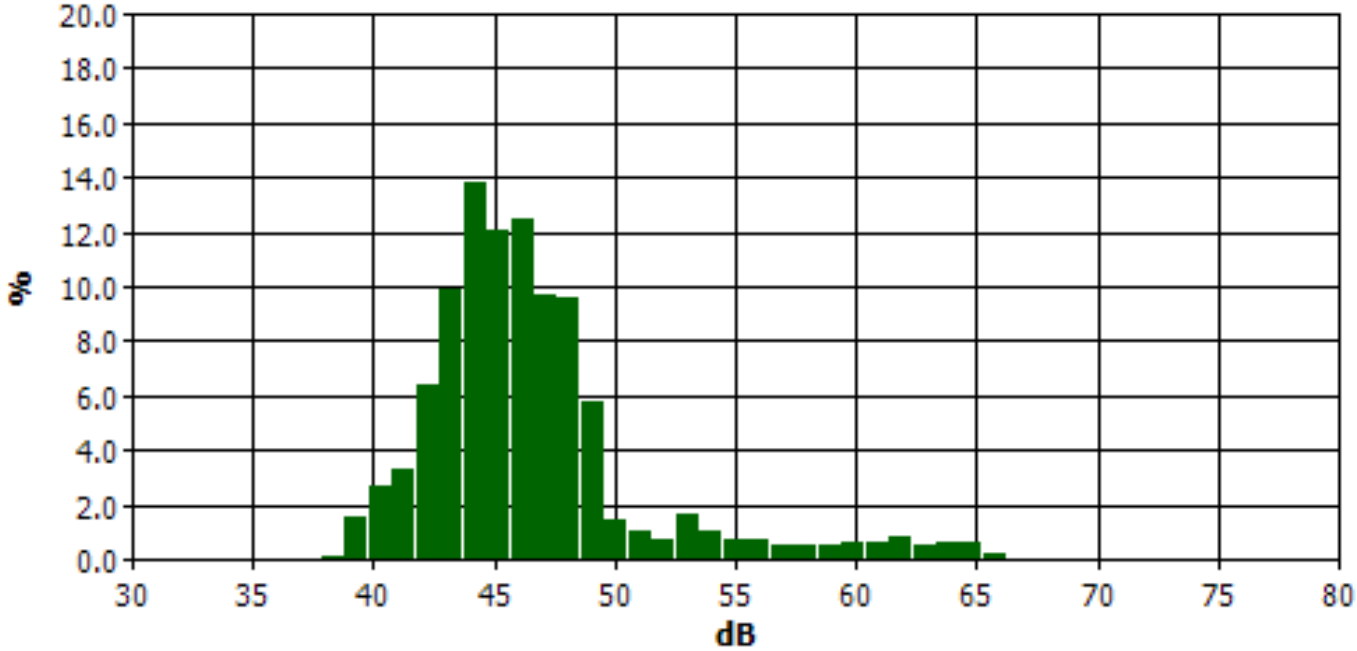
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK/EV103 - 792/ 2020
Location	N 1 - Day Time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Tuesday, December 01, 2020 10:00:00
Stop Time	Tuesday, December 01, 2020 11:00:00
User Name	JS
Comments	Human activities , Vehicles movement , domestic animals, insects.

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	51.8 dB	Dose	1	0 %
Lmin	1	38.5 dB	Lmax	1	70.3 dB
Lpk	1	83.8 dB	TWA	1	42.7 dB
L1	1	64.7 dB	L10	1	52.3 dB
L50	1	45.9 dB	L90	1	42.3 dB
Exchange Rate	1	3 dB	Bandwidth	1	OFF
Weighting	1	A	Response	1	FAST

Statistics Chart



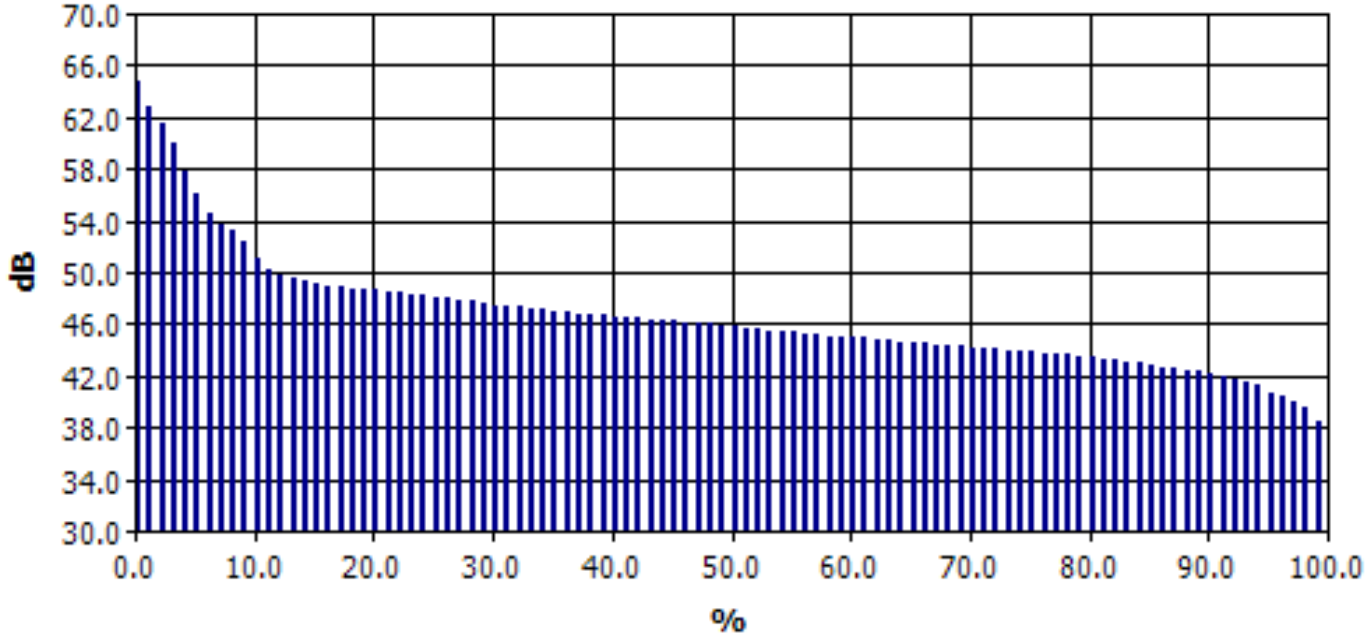
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
39.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	1.5
40.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	2.7
41.0	0.0	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	3.3
42.0	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	6.4
43.0	0.8	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.2	1.3	9.9
44.0	1.4	1.4	1.2	1.5	1.5	1.5	1.4	1.3	1.3	1.3	13.8
45.0	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.1	1.2	12.1
46.0	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	12.4
47.0	1.2	1.2	0.7	0.9	0.9	0.9	0.9	0.9	1.0	1.0	9.6
48.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.8	9.6

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
49.0	0.9	0.8	0.8	0.6	0.6	0.5	0.5	0.4	0.3	0.3	5.8
50.0	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	1.5
51.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
52.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
53.0	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.7
54.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
55.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
56.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
57.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.5
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.5
59.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.5
60.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6
61.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6
62.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
63.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.5
64.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
65.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.6
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		64.7	62.8	61.6	59.9	57.8	56.0	54.6	53.8	53.2
10%	52.3	51.0	50.2	49.8	49.5	49.3	49.2	49.0	48.9	48.8
20%	48.7	48.6	48.5	48.4	48.3	48.2	48.1	48.0	47.9	47.8
30%	47.7	47.5	47.4	47.3	47.2	47.1	47.0	46.9	46.8	46.8
40%	46.7	46.6	46.5	46.5	46.4	46.3	46.2	46.1	46.0	46.0
50%	45.9	45.8	45.7	45.6	45.5	45.4	45.4	45.3	45.2	45.1
60%	45.0	44.9	44.9	44.8	44.7	44.6	44.6	44.5	44.4	44.4
70%	44.3	44.2	44.2	44.1	44.0	43.9	43.9	43.8	43.7	43.6
80%	43.5	43.4	43.3	43.2	43.1	43.0	42.8	42.7	42.6	42.4
90%	42.3	42.1	41.9	41.7	41.5	41.2	40.7	40.4	40.0	39.5
100%	38.4									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/1/2020 10:01:00 AM	43.5	60.2	47.0	38.6	46.0	39.5
12/1/2020 10:02:00 AM	43.9	65.8	47.6	41.8	44.8	42.8
12/1/2020 10:03:00 AM	44.3	67.2	51.8	41.2	45.6	42.4
12/1/2020	46.2	62.0	48.7	42.2	47.5	43.8

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/1/2020 10:05:00 AM	45.1	62.2	49.3	41.3	48.3	42.4
12/1/2020 10:06:00 AM	43.9	63.9	46.1	41.5	44.9	42.8
12/1/2020 10:07:00 AM	46.5	63.6	51.6	43.5	48.0	44.4
12/1/2020 10:08:00 AM	48.2	62.7	49.7	46.7	49.0	47.7
12/1/2020 10:09:00 AM	48.9	65.8	51.4	47.0	49.8	47.8
12/1/2020 10:10:00 AM	47.5	68.5	52.2	43.4	49.5	44.5
12/1/2020 10:11:00 AM	44.7	60.7	47.7	42.5	46.2	43.4
12/1/2020 10:12:00 AM	47.0	64.2	50.7	43.5	49.6	44.5
12/1/2020 10:13:00 AM	47.3	65.0	51.9	43.4	50.2	44.8
12/1/2020 10:14:00 AM	45.3	66.9	51.0	40.6	47.6	42.4
12/1/2020 10:15:00 AM	45.9	73.5	51.4	41.9	47.9	43.3
12/1/2020 10:16:00 AM	47.1	62.8	50.1	43.5	49.1	45.1
12/1/2020 10:17:00 AM	48.1	62.9	50.6	44.7	49.3	46.5
12/1/2020 10:18:00 AM	48.6	66.0	49.7	47.5	49.2	48.1
12/1/2020 10:19:00 AM	48.1	64.0	50.0	45.9	49.2	46.9
12/1/2020 10:20:00 AM	46.0	67.7	52.3	44.0	46.9	45.1
12/1/2020 10:21:00 AM	46.0	67.2	52.3	42.8	48.8	43.8
12/1/2020 10:22:00 AM	44.3	60.9	46.8	41.9	45.4	43.0
12/1/2020 10:23:00 AM	42.8	64.9	50.8	38.8	44.4	40.2
12/1/2020 10:24:00 AM	41.4	57.2	44.1	38.6	42.9	39.6
12/1/2020 10:25:00 AM	42.4	64.6	52.9	38.6	43.9	39.6
12/1/2020 10:26:00 AM	44.4	63.6	50.0	38.8	47.8	40.9
12/1/2020 10:27:00 AM	45.3	61.3	48.7	42.2	47.0	43.2
12/1/2020 10:28:00 AM	48.4	63.0	50.3	46.4	49.4	47.3
12/1/2020 10:29:00 AM	49.5	64.6	51.0	48.2	50.1	49.0
12/1/2020 10:30:00 AM	48.8	65.2	53.3	47.0	49.8	48.0
12/1/2020 10:31:00 AM	49.9	71.0	58.8	45.8	53.9	46.7
12/1/2020 10:32:00 AM	55.9	83.0	70.3	43.0	60.6	44.7
12/1/2020 10:33:00 AM	45.2	79.6	49.9	42.4	46.8	43.6
12/1/2020 10:34:00 AM	45.9	62.6	49.8	43.8	46.9	45.0
12/1/2020 10:35:00 AM	47.1	63.2	50.3	45.0	48.5	46.1
12/1/2020 10:36:00 AM	45.1	63.8	52.9	41.4	48.2	42.4
12/1/2020 10:37:00 AM	43.8	76.1	52.6	40.6	45.2	42.0
12/1/2020 10:38:00 AM	44.7	64.4	53.0	40.8	46.3	42.8
12/1/2020 10:39:00 AM	44.6	65.0	49.3	40.7	46.2	42.4
12/1/2020 10:40:00 AM	43.8	67.6	54.0	39.5	45.8	40.8
12/1/2020 10:41:00 AM	48.6	67.9	57.7	40.8	52.4	42.8
12/1/2020 10:42:00 AM	46.0	74.7	56.6	41.1	48.4	42.5
12/1/2020	43.1	58.8	45.9	39.0	45.1	40.2

Logged Data Table (cont'd)

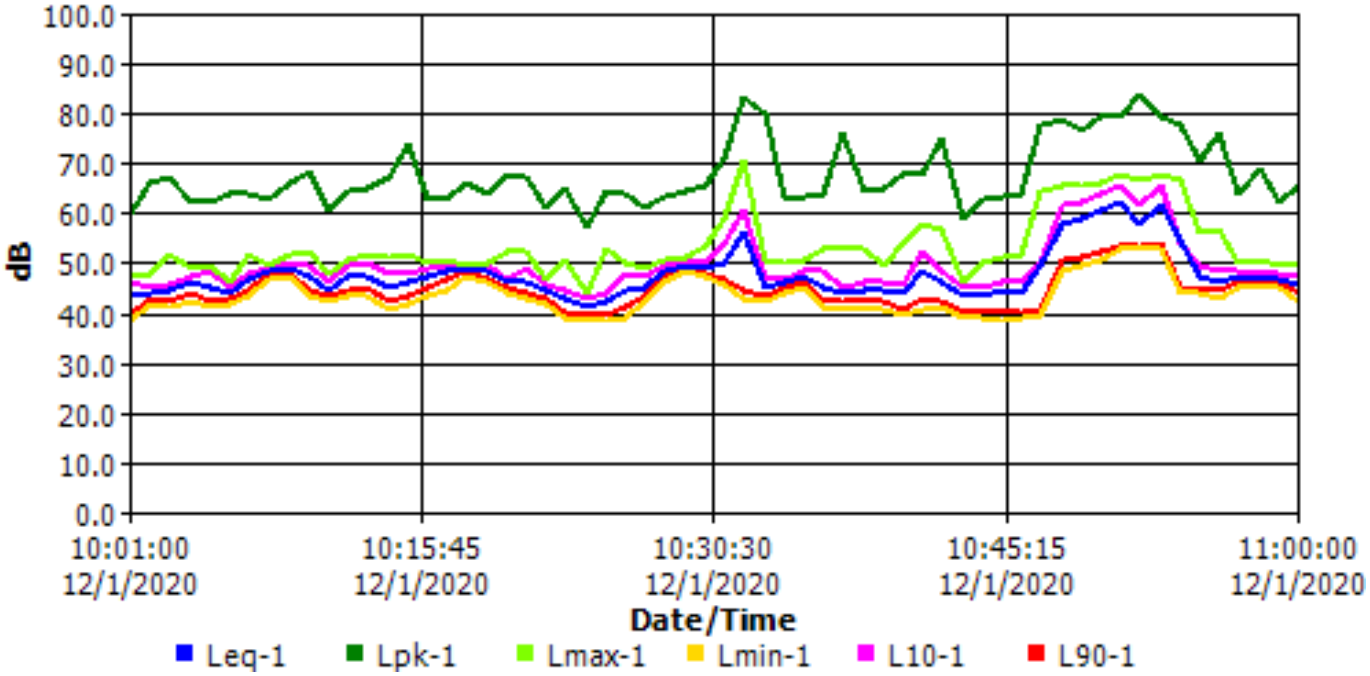
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/1/2020 10:44:00 AM	43.1	62.9	50.1	38.7	45.2	40.1
12/1/2020 10:45:00 AM	44.2	63.1	51.2	38.5	46.3	40.0
12/1/2020 10:46:00 AM	44.1	64.0	51.7	39.0	46.1	40.3
12/1/2020 10:47:00 AM	49.5	77.5	64.3	39.3	49.8	40.8
12/1/2020 10:48:00 AM	57.9	78.7	65.2	48.4	61.6	50.5
12/1/2020 10:49:00 AM	58.7	76.3	65.4	49.3	62.4	51.1
12/1/2020 10:50:00 AM	60.7	79.2	66.1	50.8	64.0	52.3
12/1/2020 10:51:00 AM	62.2	79.2	67.7	52.6	65.7	53.2
12/1/2020 10:52:00 AM	57.6	83.8	66.3	52.5	61.6	53.4
12/1/2020 10:53:00 AM	61.6	79.2	67.6	52.8	65.6	54.1
12/1/2020 10:54:00 AM	54.4	77.4	66.3	44.0	54.1	44.9
12/1/2020 10:55:00 AM	47.1	70.5	56.0	44.0	49.2	44.7
12/1/2020 10:56:00 AM	46.4	75.9	56.9	42.9	48.1	44.2
12/1/2020 10:57:00 AM	47.2	63.7	50.1	45.2	48.3	46.2
12/1/2020 10:58:00 AM	46.8	68.7	50.8	45.3	47.8	45.9
12/1/2020 10:59:00 AM	46.9	62.0	49.4	45.3	47.8	46.1
12/1/2020 11:00:00 AM	45.5	65.3	49.5	42.4	47.3	43.7

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	83.8 dB
Lmax	1	70.3 dB	Lmin	1	38.5 dB
Leq	1	51.8 dB	TWA	1	42.7 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

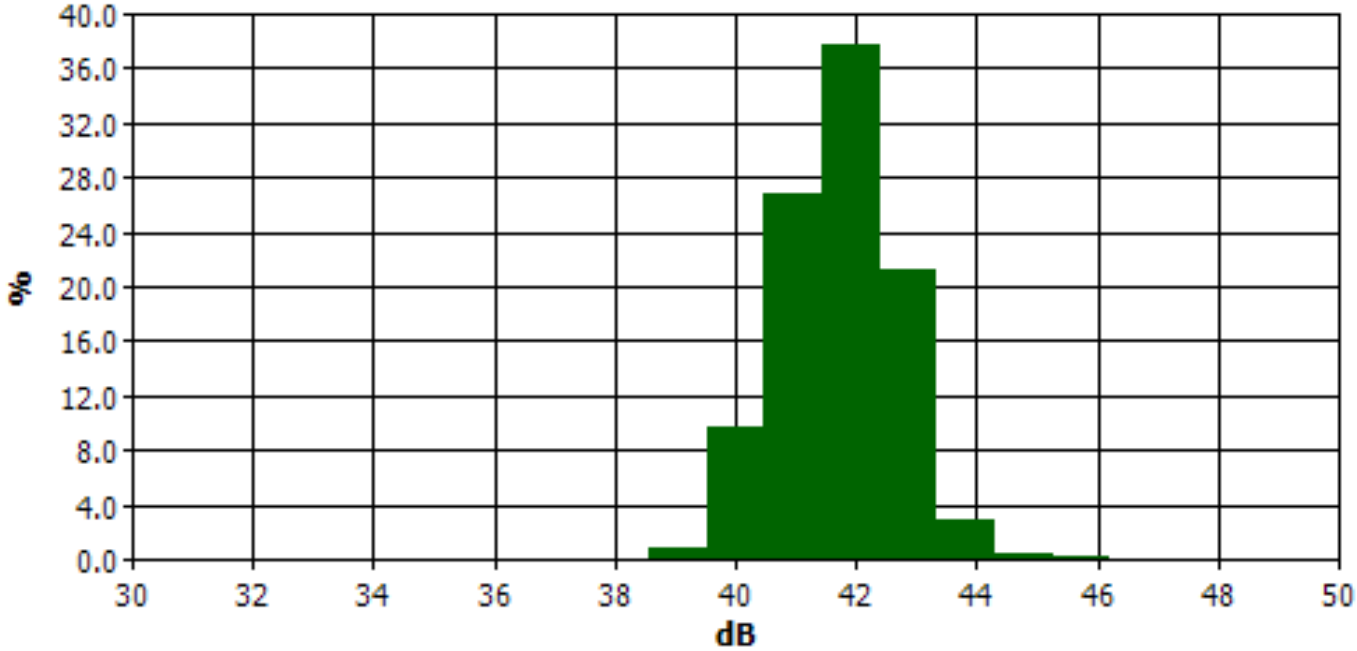
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK/EV103 - 792/2020
Location	N1 - Night time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Tuesday, December 01, 2020 21:00:00
Stop Time	Tuesday, December 01, 2020 22:00:00
User Name	JS
Comments	Domestic animals, insect ,vehicles.

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	42.3 dB	Dose	1	0 %
Lmax	1	49.6 dB	Lmin	1	38.9 dB
Lpk	1	68 dB	TWA	1	33.3 dB
L1	1	44.4 dB	L10	1	43.4 dB
L50	1	42.2 dB	L90	1	40.8 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



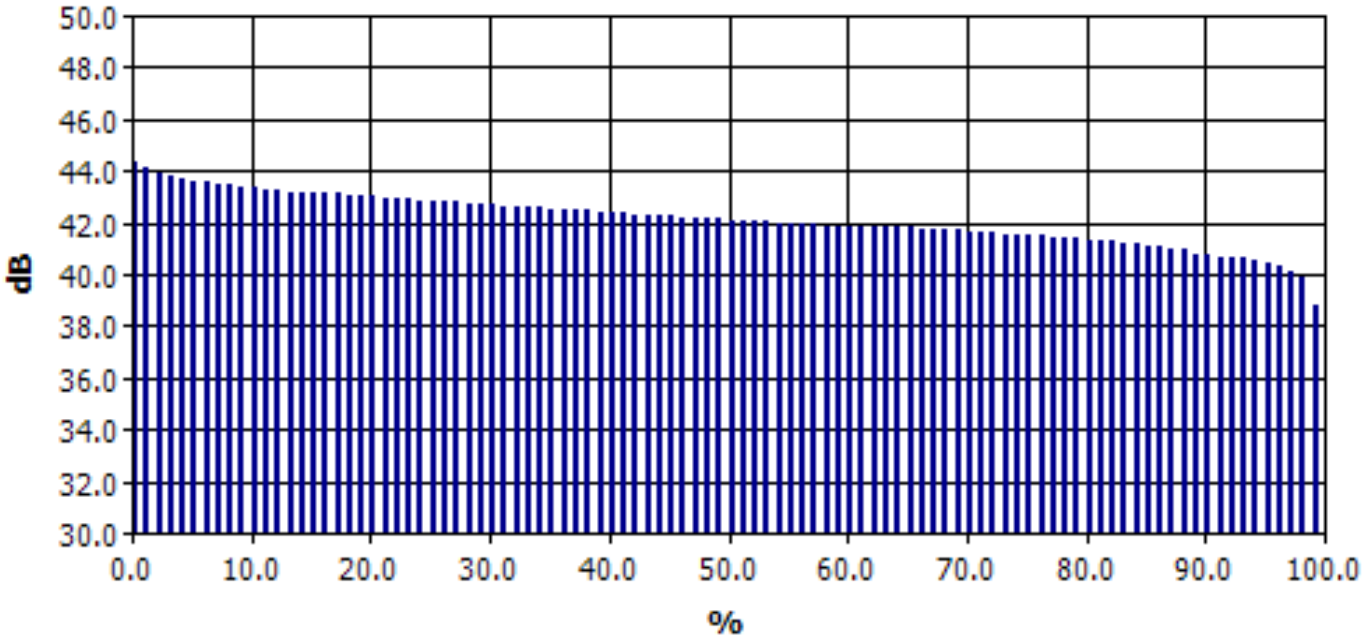
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.8
40.0	0.3	0.4	0.6	0.6	0.8	0.9	1.1	1.4	1.6	1.9	9.8
41.0	0.0	1.7	2.1	2.5	2.8	3.1	3.4	3.7	3.7	4.0	26.9
42.0	4.0	4.0	3.9	4.0	3.8	3.8	3.8	3.7	3.5	3.3	37.8
43.0	3.2	2.9	2.8	2.5	2.3	2.0	1.8	1.5	1.2	1.0	21.3
44.0	0.9	0.6	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	2.9
45.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
46.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
47.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
49.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		44.4	44.1	43.9	43.8	43.7	43.6	43.6	43.5	43.5
10%	43.4	43.4	43.3	43.3	43.2	43.2	43.1	43.1	43.1	43.0
20%	43.0	43.0	42.9	42.9	42.9	42.8	42.8	42.8	42.8	42.7
30%	42.7	42.7	42.6	42.6	42.6	42.6	42.5	42.5	42.5	42.5
40%	42.4	42.4	42.4	42.3	42.3	42.3	42.3	42.2	42.2	42.2
50%	42.2	42.1	42.1	42.1	42.1	42.0	42.0	42.0	42.0	41.9
60%	41.9	41.9	41.9	41.8	41.8	41.8	41.8	41.7	41.7	41.7
70%	41.7	41.6	41.6	41.6	41.5	41.5	41.5	41.5	41.4	41.4
80%	41.4	41.3	41.3	41.3	41.2	41.2	41.1	41.1	41.0	41.0
90%	40.8	40.8	40.7	40.6	40.6	40.5	40.4	40.3	40.1	39.9
100%	38.8									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/1/2020 9:01:00 PM	42.8	57.7	44.8	40.4	43.6	42.0
12/1/2020 9:02:00 PM	43.0	58.2	46.4	41.4	43.9	42.3
12/1/2020 9:03:00 PM	43.0	64.0	46.0	41.3	44.0	42.2
12/1/2020 9:04:00 PM	43.0	58.0	44.8	41.3	43.8	42.4
12/1/2020 9:05:00 PM	43.3	62.1	46.5	41.3	44.0	42.5
12/1/2020 9:06:00 PM	43.0	58.1	44.9	41.3	43.8	42.3
12/1/2020 9:07:00 PM	43.4	60.1	46.4	41.6	44.1	42.7
12/1/2020 9:08:00 PM	43.4	63.2	47.1	41.8	44.2	42.8
12/1/2020 9:09:00 PM	43.5	65.4	48.3	41.6	44.4	42.6
12/1/2020 9:10:00 PM	43.5	61.0	47.5	41.3	44.2	42.6
12/1/2020 9:11:00 PM	43.3	58.3	46.5	40.9	44.2	42.4
12/1/2020 9:12:00 PM	42.4	62.4	45.6	40.8	43.3	41.7
12/1/2020 9:13:00 PM	42.7	61.3	46.8	40.6	43.6	41.7
12/1/2020 9:14:00 PM	42.0	59.3	47.3	40.4	42.9	41.4
12/1/2020 9:15:00 PM	42.0	57.3	44.1	40.4	42.9	41.4
12/1/2020	41.7	57.2	45.3	40.1	42.7	40.9

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/1/2020 9:17:00 PM	42.0	60.2	48.0	40.1	42.9	40.9
12/1/2020 9:18:00 PM	42.4	60.4	44.7	40.3	43.2	41.6
12/1/2020 9:19:00 PM	42.4	57.6	44.6	40.5	43.3	41.5
12/1/2020 9:20:00 PM	42.3	60.4	45.0	40.7	43.2	41.5
12/1/2020 9:21:00 PM	42.3	57.4	44.0	40.5	43.2	41.6
12/1/2020 9:22:00 PM	41.5	57.0	43.8	39.3	42.8	40.3
12/1/2020 9:23:00 PM	41.9	57.2	44.2	40.1	42.9	41.0
12/1/2020 9:24:00 PM	42.2	68.0	49.6	40.5	42.7	41.0
12/1/2020 9:25:00 PM	42.5	57.5	44.5	40.7	43.4	41.8
12/1/2020 9:26:00 PM	42.5	57.9	44.3	40.9	43.3	41.8
12/1/2020 9:27:00 PM	42.5	61.0	44.8	40.7	43.5	41.7
12/1/2020 9:28:00 PM	42.9	57.9	44.9	40.6	43.9	42.1
12/1/2020 9:29:00 PM	43.1	59.2	45.6	40.8	43.9	42.4
12/1/2020 9:30:00 PM	43.0	57.7	45.6	40.5	43.8	42.0
12/1/2020 9:31:00 PM	43.6	66.4	49.3	41.3	44.3	42.7
12/1/2020 9:32:00 PM	42.9	58.4	45.0	40.9	43.8	42.1
12/1/2020 9:33:00 PM	42.9	58.1	45.0	40.3	43.9	41.9
12/1/2020 9:34:00 PM	43.3	65.1	48.6	41.5	44.0	42.5
12/1/2020 9:35:00 PM	42.6	60.3	45.7	40.5	43.7	41.7
12/1/2020 9:36:00 PM	41.8	61.6	46.3	39.3	42.8	40.8
12/1/2020 9:37:00 PM	41.6	57.9	44.2	39.7	42.5	40.8
12/1/2020 9:38:00 PM	41.8	58.6	44.1	39.8	42.7	41.0
12/1/2020 9:39:00 PM	41.5	57.7	44.7	39.8	42.4	40.7
12/1/2020 9:40:00 PM	41.6	59.0	45.2	39.2	42.7	40.3
12/1/2020 9:41:00 PM	40.5	61.9	44.0	39.1	41.4	39.9
12/1/2020 9:42:00 PM	40.8	55.8	42.9	38.9	41.9	40.0
12/1/2020 9:43:00 PM	41.3	60.6	44.2	39.1	42.6	40.4
12/1/2020 9:44:00 PM	41.0	56.7	42.6	39.5	41.8	40.3
12/1/2020 9:45:00 PM	41.8	58.7	44.6	40.5	42.6	41.0
12/1/2020 9:46:00 PM	41.7	58.1	44.1	40.0	42.6	40.6
12/1/2020 9:47:00 PM	42.2	56.8	44.0	39.9	43.0	41.3
12/1/2020 9:48:00 PM	42.5	59.1	45.2	41.1	43.3	41.9
12/1/2020 9:49:00 PM	41.7	58.3	44.8	39.9	42.8	40.7
12/1/2020 9:50:00 PM	41.7	60.0	46.3	40.1	42.6	41.0
12/1/2020 9:51:00 PM	41.7	61.4	45.9	39.9	42.6	40.9
12/1/2020 9:52:00 PM	42.2	65.7	45.9	40.6	43.1	41.7
12/1/2020 9:53:00 PM	42.5	65.1	47.1	40.8	43.4	41.8
12/1/2020 9:54:00 PM	42.4	60.2	44.0	40.6	43.2	41.7
12/1/2020	42.2	56.9	44.5	40.5	43.0	41.5

Logged Data Table (cont'd)

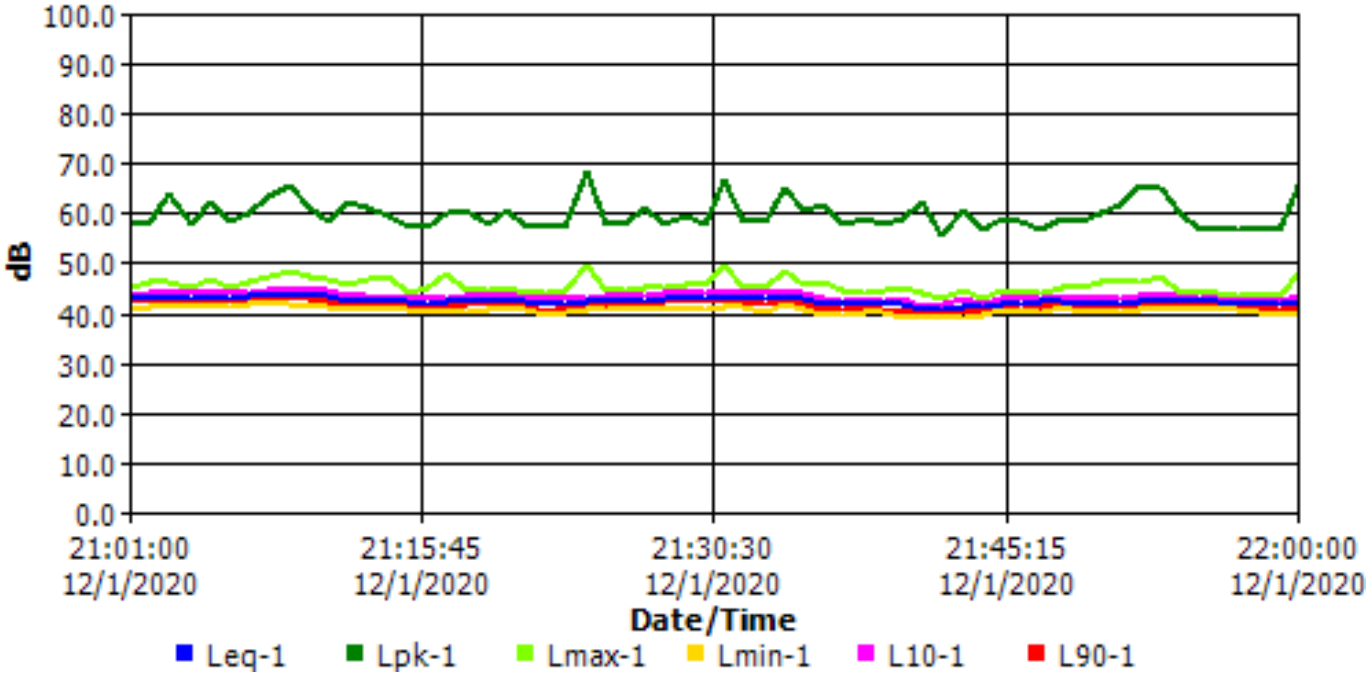
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/1/2020 9:56:00 PM	42.3	57.2	44.1	40.5	43.1	41.5
12/1/2020 9:57:00 PM	41.9	56.6	43.5	40.5	42.7	41.4
12/1/2020 9:58:00 PM	41.9	57.0	43.7	40.0	42.7	41.2
12/1/2020 9:59:00 PM	41.5	56.4	43.2	39.5	42.5	40.5
12/1/2020 10:00:00 PM	42.4	65.5	48.0	39.3	43.3	41.3

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	68 dB
Lmax	1	49.6 dB	Lmin	1	38.9 dB
Leq	1	42.3 dB	TWA	1	33.3 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

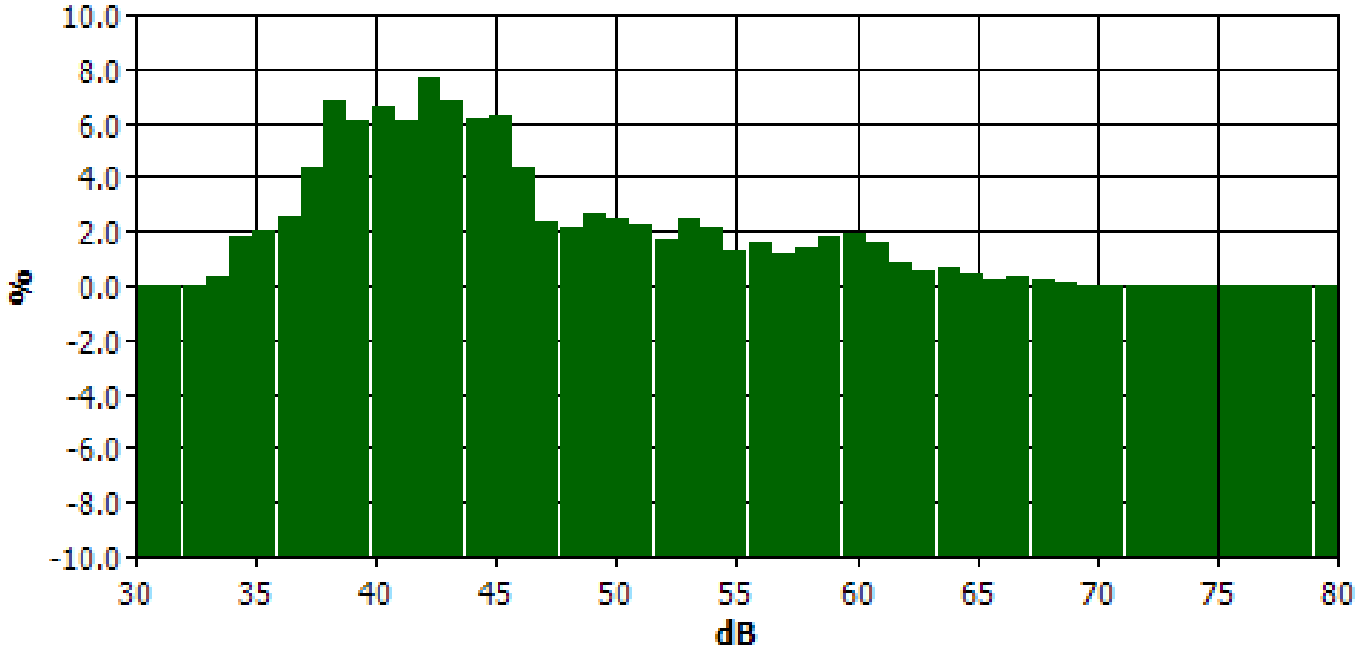
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK / EV103 - 792 /2020
Location	N 2 - Day time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Wednesday, December 02, 2020 13:00:00
Stop Time	Wednesday, December 02, 2020 14:00:00
User Name	JS
Comments	Boats movement , human activities , domestic animals .

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	53.7 dB	Dose	1	0 %
Lmin	1	33 dB	Lmax	1	70.6 dB
Lpk	1	81.3 dB	TWA	1	44.7 dB
L1	1	65.8 dB	L10	1	57.8 dB
L50	1	43.7 dB	L90	1	37.7 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



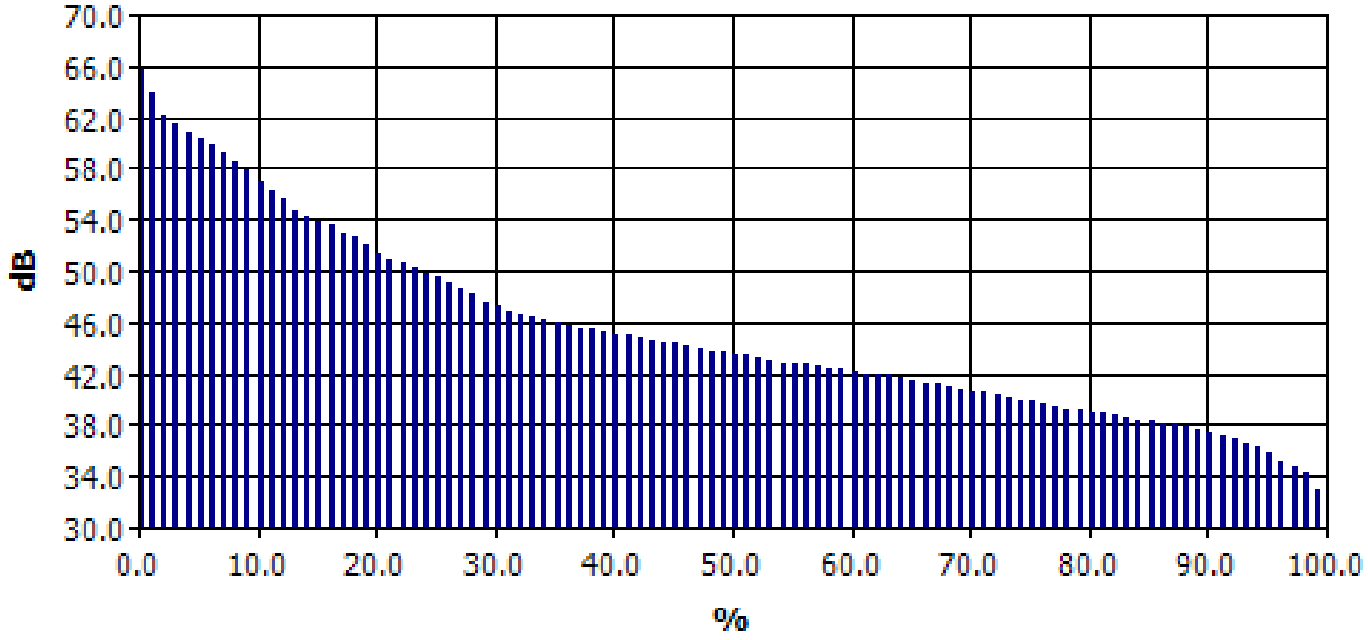
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.3
34.0	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.0	0.2	0.2	1.8
35.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.2	2.0
36.0	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	2.6
37.0	0.3	0.4	0.4	0.0	0.5	0.5	0.5	0.6	0.6	0.6	4.4
38.0	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	6.8
39.0	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	6.1
40.0	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.7	0.7	0.7	6.6
41.0	0.0	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	6.1
42.0	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.7	7.7
43.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	6.8
44.0	0.7	0.6	0.5	0.7	0.6	0.6	0.6	0.6	0.6	0.6	6.2
45.0	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	6.3
46.0	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	4.4
47.0	0.4	0.4	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	2.3
48.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.1

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
49.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	2.7
50.0	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4
51.0	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.2
52.0	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	1.7
53.0	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	2.4
54.0	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	2.1
55.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.3
56.0	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	1.6
57.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1
58.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	1.4
59.0	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.8
60.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.9
61.0	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	1.6
62.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
63.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.5
64.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6
65.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		65.8	63.9	62.2	61.4	60.8	60.3	59.8	59.2	58.6
10%	57.8	56.9	56.3	55.6	54.8	54.3	53.9	53.5	53.0	52.6
20%	52.0	51.4	51.0	50.6	50.2	49.8	49.5	49.1	48.6	48.2
30%	47.6	47.2	46.8	46.6	46.3	46.1	45.9	45.7	45.6	45.4
40%	45.3	45.1	45.0	44.8	44.6	44.4	44.3	44.1	44.0	43.8
50%	43.7	43.5	43.4	43.2	43.1	42.9	42.8	42.7	42.5	42.4
60%	42.3	42.2	42.0	41.9	41.8	41.6	41.5	41.3	41.2	41.0
70%	40.8	40.6	40.5	40.3	40.2	40.0	39.9	39.7	39.5	39.3
80%	39.2	39.0	38.9	38.7	38.6	38.4	38.3	38.2	38.0	37.8
90%	37.7	37.5	37.3	36.9	36.6	36.2	35.8	35.2	34.8	34.2
100%	32.9									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/2/2020 1:01:00 PM	60.1	77.8	62.7	57.3	61.6	58.9
12/2/2020 1:02:00 PM	61.3	78.5	63.8	59.2	62.3	60.4
12/2/2020 1:03:00 PM	60.1	78.7	63.4	57.2	61.4	58.7
12/2/2020	56.7	72.2	58.8	55.1	57.7	56.0

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/2/2020 1:05:00 PM	54.4	70.8	57.3	50.2	55.8	52.9
12/2/2020 1:06:00 PM	53.8	66.3	55.4	51.9	54.7	53.1
12/2/2020 1:07:00 PM	56.3	72.3	61.2	51.3	59.1	53.0
12/2/2020 1:08:00 PM	61.3	79.1	65.7	50.0	64.7	51.5
12/2/2020 1:09:00 PM	49.1	63.3	51.6	46.7	50.2	48.2
12/2/2020 1:10:00 PM	50.3	64.0	52.9	47.5	51.8	49.0
12/2/2020 1:11:00 PM	48.6	62.4	51.8	43.8	50.5	45.6
12/2/2020 1:12:00 PM	46.1	61.8	48.8	44.5	46.9	45.4
12/2/2020 1:13:00 PM	45.7	60.1	47.6	44.5	46.4	45.2
12/2/2020 1:14:00 PM	45.6	63.8	50.9	44.0	46.5	44.7
12/2/2020 1:15:00 PM	45.3	61.0	47.7	43.6	46.3	44.3
12/2/2020 1:16:00 PM	45.0	64.9	51.3	42.2	46.7	43.6
12/2/2020 1:17:00 PM	44.0	60.9	49.6	41.5	45.1	42.8
12/2/2020 1:18:00 PM	43.5	64.5	49.8	40.3	45.0	41.8
12/2/2020 1:19:00 PM	43.1	58.0	45.8	40.2	44.3	41.8
12/2/2020 1:20:00 PM	43.4	65.9	51.1	39.9	45.0	41.7
12/2/2020 1:21:00 PM	43.5	65.5	52.3	39.7	45.0	41.8
12/2/2020 1:22:00 PM	42.8	69.1	54.5	40.4	44.4	41.3
12/2/2020 1:23:00 PM	40.1	61.6	45.7	38.3	40.9	39.2
12/2/2020 1:24:00 PM	40.0	54.2	42.6	38.1	41.4	38.8
12/2/2020 1:25:00 PM	39.8	58.3	47.3	37.7	41.3	38.4
12/2/2020 1:26:00 PM	41.1	59.8	47.1	38.8	42.5	39.7
12/2/2020 1:27:00 PM	40.0	64.0	52.5	36.1	42.0	37.7
12/2/2020 1:28:00 PM	39.7	70.4	51.7	34.5	42.1	37.0
12/2/2020 1:29:00 PM	43.9	59.7	53.1	34.4	48.9	37.6
12/2/2020 1:30:00 PM	50.1	64.5	56.0	39.5	53.6	41.7
12/2/2020 1:31:00 PM	42.1	57.6	46.4	38.8	43.9	40.2
12/2/2020 1:32:00 PM	45.7	61.6	47.9	43.1	47.2	44.2
12/2/2020 1:33:00 PM	51.0	65.0	53.6	46.5	52.8	48.4
12/2/2020 1:34:00 PM	47.6	76.7	55.4	41.4	50.8	43.4
12/2/2020 1:35:00 PM	42.5	58.6	44.9	40.2	43.5	41.6
12/2/2020 1:36:00 PM	40.8	59.8	47.5	37.1	43.1	38.3
12/2/2020 1:37:00 PM	39.1	60.9	46.3	36.0	41.7	37.1
12/2/2020 1:38:00 PM	38.8	58.4	45.0	36.7	40.0	37.6
12/2/2020 1:39:00 PM	38.9	58.4	44.3	36.5	40.5	37.5
12/2/2020 1:40:00 PM	42.7	68.6	57.8	34.3	46.4	36.3
12/2/2020 1:41:00 PM	46.5	69.3	59.3	38.5	48.1	41.2
12/2/2020 1:42:00 PM	46.1	59.5	49.5	41.2	47.9	43.8
12/2/2020	55.6	72.3	64.0	46.4	59.3	48.3

Logged Data Table (cont'd)

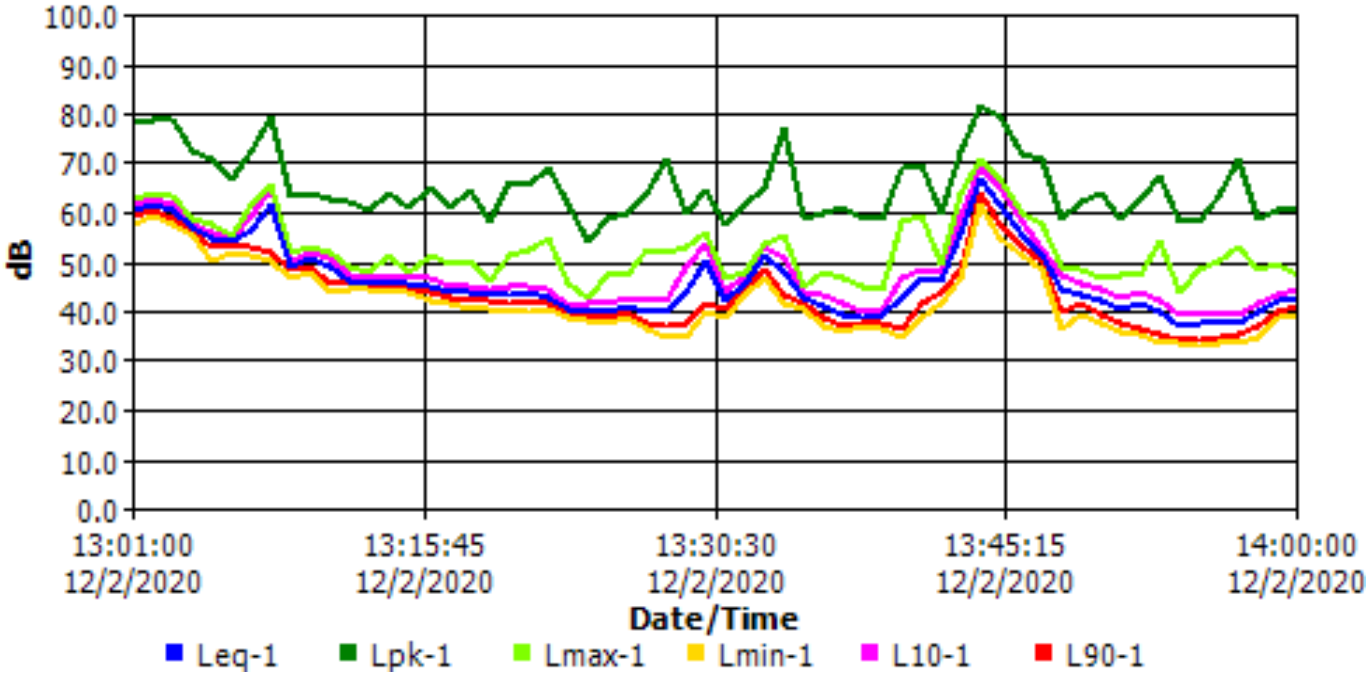
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/2/2020 1:44:00 PM	66.7	81.3	70.6	61.5	68.8	63.9
12/2/2020 1:45:00 PM	61.3	79.0	66.8	54.4	64.7	57.3
12/2/2020 1:46:00 PM	55.2	71.7	60.0	50.9	57.8	52.7
12/2/2020 1:47:00 PM	51.2	70.4	57.3	48.1	52.4	49.8
12/2/2020 1:48:00 PM	44.5	58.5	48.7	36.2	47.2	39.9
12/2/2020 1:49:00 PM	43.4	61.9	48.5	39.4	45.2	41.2
12/2/2020 1:50:00 PM	42.0	63.7	46.7	37.5	44.1	38.9
12/2/2020 1:51:00 PM	40.2	58.5	47.0	35.5	42.6	37.7
12/2/2020 1:52:00 PM	41.3	62.3	47.1	34.9	43.5	36.5
12/2/2020 1:53:00 PM	39.8	67.2	54.0	33.5	42.2	34.9
12/2/2020 1:54:00 PM	36.6	58.2	43.5	33.2	38.9	34.1
12/2/2020 1:55:00 PM	37.2	57.9	48.2	33.0	38.9	34.1
12/2/2020 1:56:00 PM	38.2	62.9	50.2	33.4	39.3	34.4
12/2/2020 1:57:00 PM	37.5	70.8	52.7	33.6	38.9	34.9
12/2/2020 1:58:00 PM	39.9	58.6	48.4	34.4	41.5	36.7
12/2/2020 1:59:00 PM	41.9	60.1	49.5	38.5	43.3	39.8
12/2/2020 2:00:00 PM	42.8	60.1	47.4	39.1	44.2	40.9

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	81.3 dB
Lmax	1	70.6 dB	Lmin	1	33 dB
Leq	1	53.7 dB	TWA	1	44.7 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

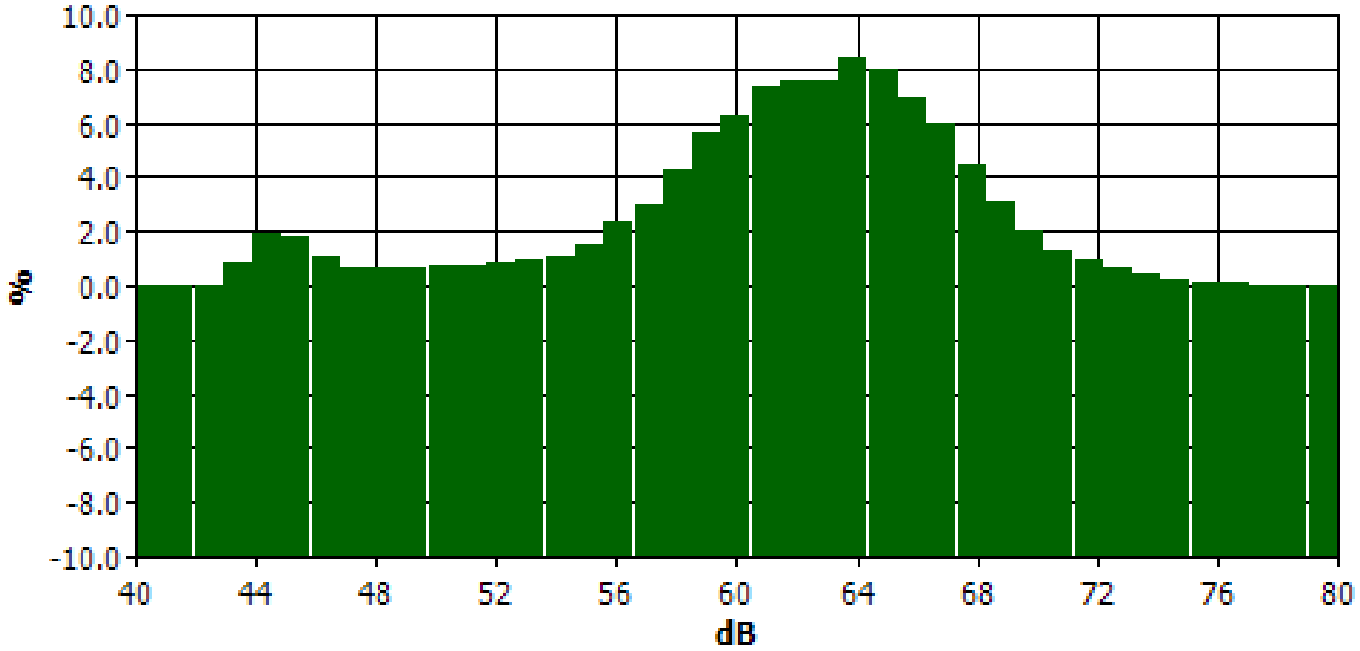
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK / EV103 - 792 / 2020
Location	N2 - Night time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Wednesday, December 02, 2020 21:00:00
Stop Time	Wednesday, December 02, 2020 22:00:00
User Name	JS
Comments	Domestic animals , genset , human activities , insects.

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	65.2 dB	Lmin	1	42.7 dB
Lmax	1	79.7 dB	Lpk	1	88 dB
Dose	1	0 %	TWA	1	56.2 dB
L1	1	73.7 dB	L10	1	68.6 dB
L50	1	62.9 dB	L90	1	52.8 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



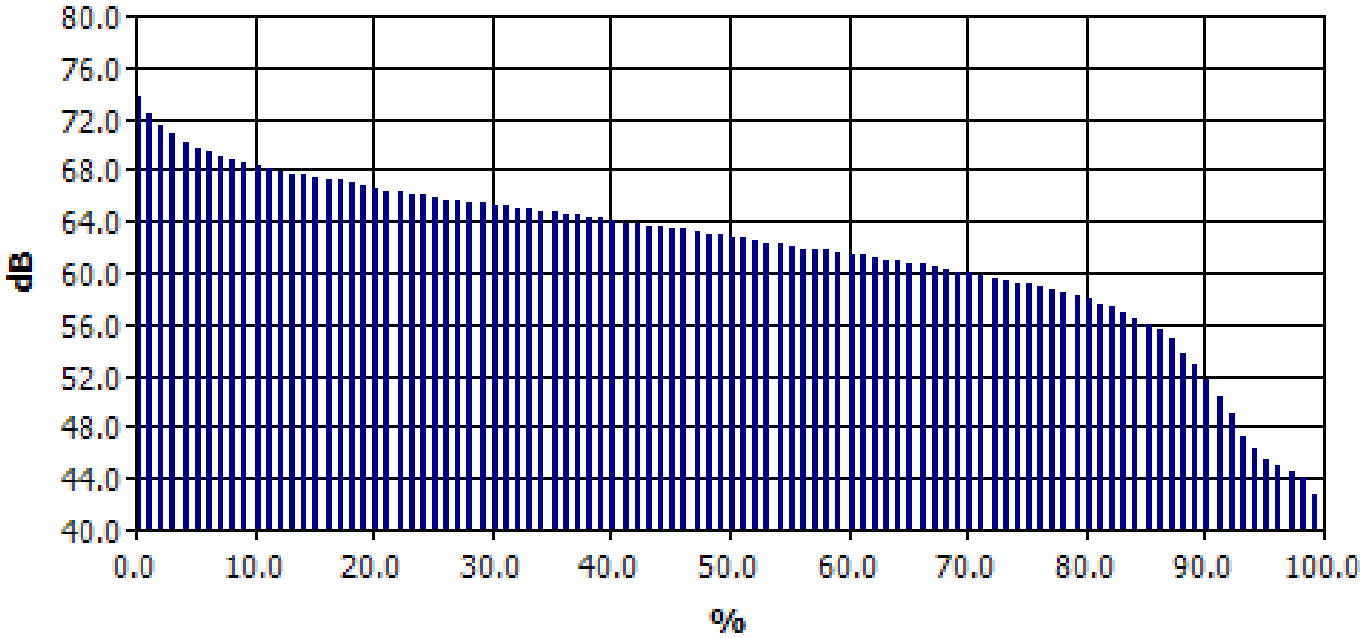
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
44.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3	0.3	1.9
45.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	1.8
46.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
47.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
48.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6
49.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
50.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
51.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
52.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
53.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
54.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
55.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	1.5
56.0	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	2.3
57.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.0
58.0	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	4.2

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
59.0	0.6	0.6	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	5.7
60.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	6.2
61.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	7.3
62.0	0.9	0.9	0.6	0.8	0.7	0.7	0.7	0.7	0.8	0.7	7.6
63.0	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	7.5
64.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	8.4
65.0	0.9	0.9	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.7	8.0
66.0	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	6.9
67.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	6.0
68.0	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.5
69.0	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	3.1
70.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.0
71.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.3
72.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
73.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6
74.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		73.7	72.3	71.4	70.7	70.2	69.7	69.4	69.1	68.8
10%	68.6	68.3	68.1	67.9	67.7	67.6	67.4	67.2	67.1	66.9
20%	66.7	66.6	66.4	66.3	66.1	66.0	65.9	65.7	65.6	65.5
30%	65.3	65.2	65.1	65.0	64.9	64.8	64.7	64.5	64.4	64.3
40%	64.2	64.1	63.9	63.8	63.7	63.5	63.4	63.3	63.1	63.0
50%	62.9	62.7	62.6	62.5	62.3	62.2	62.0	61.9	61.8	61.7
60%	61.6	61.4	61.3	61.1	61.0	60.9	60.7	60.6	60.4	60.2
70%	60.1	59.9	59.7	59.6	59.4	59.2	59.0	58.8	58.6	58.4
80%	58.2	57.9	57.6	57.2	56.9	56.5	56.0	55.5	54.8	53.8
90%	52.8	51.7	50.4	49.0	47.3	46.2	45.4	44.9	44.5	44.0
100%	42.6									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/2/2020 9:01:00 PM	59.8	78.4	66.2	44.2	62.2	56.3
12/2/2020 9:02:00 PM	56.7	79.2	70.6	43.9	61.6	44.6
12/2/2020 9:03:00 PM	59.5	76.6	66.9	45.1	62.5	50.3
12/2/2020 9:04:00 PM	60.1	78.6	68.1	44.3	62.9	46.5
12/2/2020 9:05:00 PM	62.2	81.9	72.5	52.0	64.9	58.7
12/2/2020 9:06:00 PM	62.6	80.2	69.3	44.2	65.8	46.8
12/2/2020 9:07:00 PM	57.3	78.7	69.9	44.3	61.9	45.9
12/2/2020	60.7	78.5	68.7	47.1	64.3	51.0

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/2/2020 9:09:00 PM	63.7	80.1	71.4	48.1	67.3	52.9
12/2/2020 9:10:00 PM	65.5	83.4	73.5	47.1	69.1	55.9
12/2/2020 9:11:00 PM	65.4	83.4	74.3	51.1	69.3	56.6
12/2/2020 9:12:00 PM	61.0	81.4	71.5	44.1	66.0	45.3
12/2/2020 9:13:00 PM	61.5	82.5	74.4	44.5	66.4	47.0
12/2/2020 9:14:00 PM	66.2	83.6	74.8	53.1	69.4	59.0
12/2/2020 9:15:00 PM	66.1	83.6	75.2	56.0	69.6	60.1
12/2/2020 9:16:00 PM	67.8	84.5	75.1	55.8	70.4	62.4
12/2/2020 9:17:00 PM	64.6	83.2	74.9	44.5	68.5	49.1
12/2/2020 9:18:00 PM	63.2	84.7	74.1	44.7	67.3	46.7
12/2/2020 9:19:00 PM	62.8	80.6	69.4	55.4	65.1	58.9
12/2/2020 9:20:00 PM	64.8	82.5	73.0	56.8	67.8	60.4
12/2/2020 9:21:00 PM	63.1	81.5	69.2	53.7	65.7	59.9
12/2/2020 9:22:00 PM	63.5	81.6	71.2	44.5	66.3	58.3
12/2/2020 9:23:00 PM	56.9	76.3	65.1	43.5	61.8	44.9
12/2/2020 9:24:00 PM	61.7	77.8	69.5	48.6	64.5	56.1
12/2/2020 9:25:00 PM	62.8	78.5	69.6	54.9	65.5	59.3
12/2/2020 9:26:00 PM	62.0	78.3	68.2	55.8	63.9	59.2
12/2/2020 9:27:00 PM	61.5	77.0	66.7	43.9	63.9	57.3
12/2/2020 9:28:00 PM	59.2	79.4	69.7	49.8	61.0	55.4
12/2/2020 9:29:00 PM	58.6	75.4	62.6	52.9	60.4	56.1
12/2/2020 9:30:00 PM	57.6	79.8	68.6	44.1	60.0	45.7
12/2/2020 9:31:00 PM	62.5	80.3	68.7	44.8	65.2	59.3
12/2/2020 9:32:00 PM	67.7	85.3	74.5	58.3	70.5	62.8
12/2/2020 9:33:00 PM	68.2	86.7	76.1	58.9	70.6	64.7
12/2/2020 9:34:00 PM	66.9	83.7	71.7	61.3	68.7	65.0
12/2/2020 9:35:00 PM	66.9	86.2	77.0	55.8	70.5	57.1
12/2/2020 9:36:00 PM	60.1	79.0	67.1	49.4	63.6	50.9
12/2/2020 9:37:00 PM	63.5	83.2	75.5	49.6	67.4	54.0
12/2/2020 9:38:00 PM	67.7	85.3	74.5	54.8	70.2	62.6
12/2/2020 9:39:00 PM	66.1	82.4	72.9	55.2	68.9	59.7
12/2/2020 9:40:00 PM	63.8	82.5	75.2	44.1	67.6	51.4
12/2/2020 9:41:00 PM	62.3	81.5	68.7	44.0	66.3	44.7
12/2/2020 9:42:00 PM	66.3	83.4	72.0	44.4	68.7	62.7
12/2/2020 9:43:00 PM	65.5	82.1	72.8	57.3	68.1	61.9
12/2/2020 9:44:00 PM	66.9	83.6	73.4	58.1	69.5	63.2
12/2/2020 9:45:00 PM	65.8	85.0	74.9	43.1	69.1	45.0
12/2/2020 9:46:00 PM	63.9	80.8	72.4	43.2	67.4	47.0
12/2/2020	69.9	86.5	77.1	52.6	74.1	61.5

Logged Data Table (cont'd)

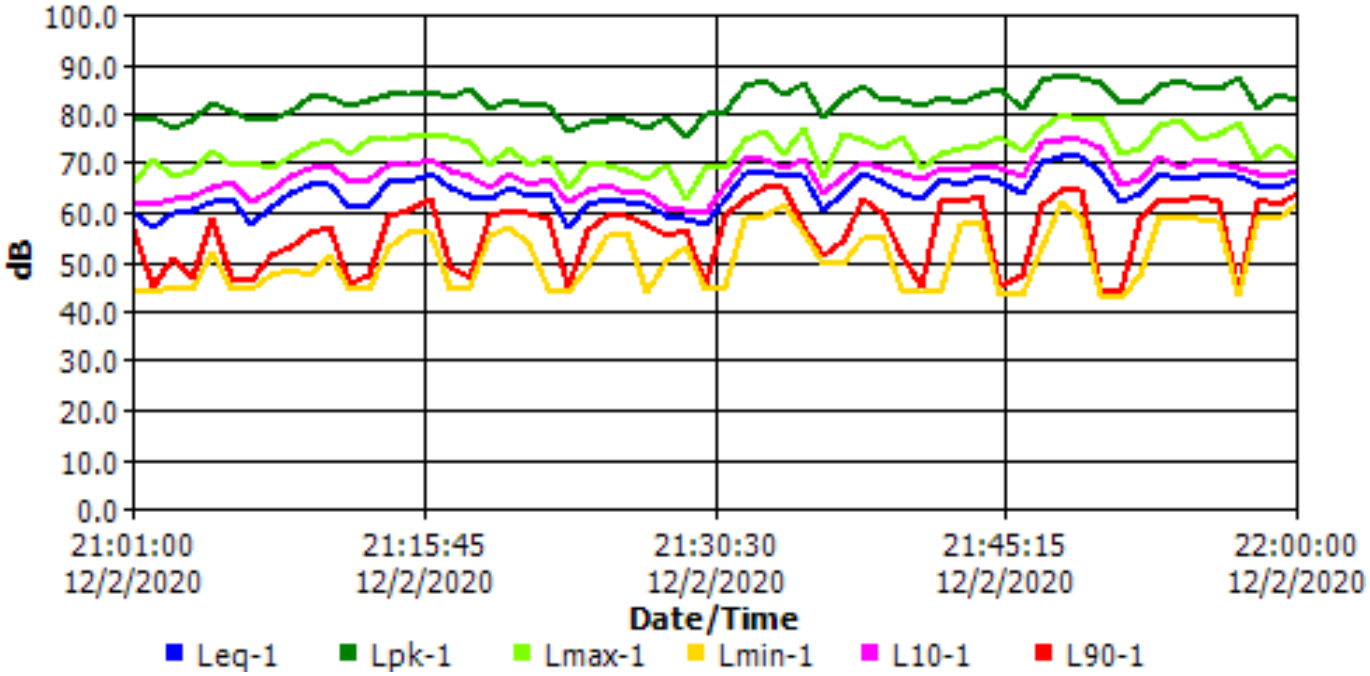
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/2/2020 9:48:00 PM	71.1	88.0	79.7	61.9	74.7	64.2
12/2/2020 9:49:00 PM	71.1	87.3	78.8	58.4	74.7	64.3
12/2/2020 9:50:00 PM	68.0	86.1	79.0	42.9	73.1	43.9
12/2/2020 9:51:00 PM	62.2	82.1	71.6	42.7	65.5	43.6
12/2/2020 9:52:00 PM	64.0	81.9	73.1	46.9	66.7	58.7
12/2/2020 9:53:00 PM	67.7	85.5	77.6	59.1	71.0	62.7
12/2/2020 9:54:00 PM	66.4	86.3	78.4	58.7	69.0	61.9
12/2/2020 9:55:00 PM	67.1	85.1	74.7	58.6	70.5	63.3
12/2/2020 9:56:00 PM	66.9	84.7	75.9	58.2	69.8	62.2
12/2/2020 9:57:00 PM	67.1	87.2	78.1	42.9	69.0	44.2
12/2/2020 9:58:00 PM	65.7	81.1	70.5	59.3	67.9	62.8
12/2/2020 9:59:00 PM	64.8	83.7	73.4	58.5	66.9	61.6
12/2/2020 10:00:00 PM	66.4	82.4	70.3	61.3	68.3	63.6

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	88 dB
Lmax	1	79.7 dB	Lmin	1	42.7 dB
Leq	1	65.2 dB	TWA	1	56.2 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

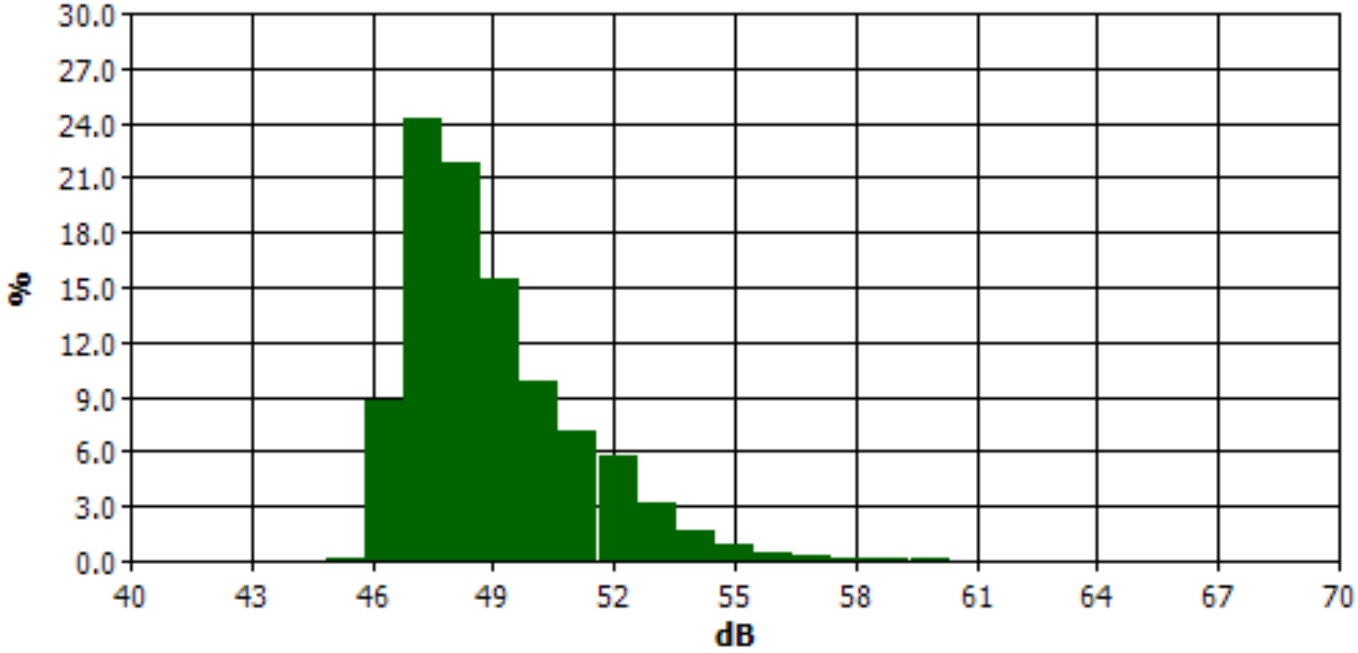
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK / EV103 - 792 / 2020
Location	N3 - Day time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Friday, December 04, 2020 09:00:00
Stop Time	Friday, December 04, 2020 10:00:00
User Name	JS
Comments	Vehicles movements , human activities , domestic animals.

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	50 dB	Dose	1	0 %
Lmin	1	45.4 dB	Lmax	1	66.3 dB
Lpk	1	80.6 dB	TWA	1	41 dB
L1	1	56.3 dB	L10	1	52.3 dB
L50	1	48.6 dB	L90	1	46.9 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



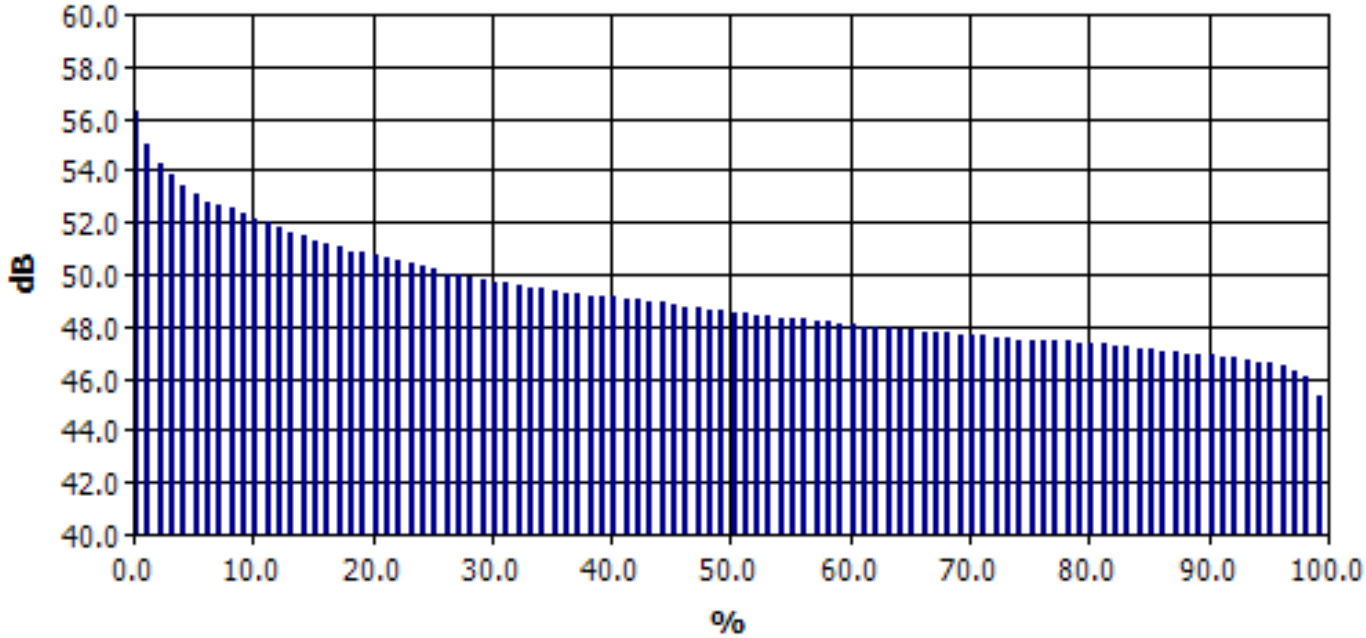
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
46.0	0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.3	1.6	2.1	8.7
47.0	2.4	2.6	1.7	2.3	2.4	2.5	2.6	2.5	2.6	2.6	24.2
48.0	2.6	2.5	2.4	2.3	2.2	2.1	2.1	1.9	1.9	1.9	21.8
49.0	1.8	1.7	1.6	1.6	1.5	1.5	1.5	1.5	1.4	1.4	15.4
50.0	1.4	1.3	0.8	1.1	0.9	0.9	0.9	0.9	0.8	0.8	9.8
51.0	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.6	7.1
52.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	5.7
53.0	0.5	0.5	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	3.1
54.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	1.6
55.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
56.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		56.3	55.0	54.3	53.8	53.4	53.1	52.8	52.7	52.5
10%	52.3	52.1	52.0	51.8	51.6	51.5	51.3	51.2	51.1	50.9
20%	50.8	50.7	50.6	50.5	50.4	50.3	50.2	50.0	50.0	49.9
30%	49.8	49.7	49.7	49.6	49.5	49.5	49.4	49.3	49.3	49.2
40%	49.1	49.1	49.0	49.0	48.9	48.9	48.8	48.7	48.7	48.6
50%	48.6	48.5	48.5	48.4	48.4	48.3	48.3	48.3	48.2	48.2
60%	48.1	48.1	48.0	48.0	48.0	47.9	47.9	47.8	47.8	47.8
70%	47.7	47.7	47.7	47.6	47.6	47.5	47.5	47.5	47.4	47.4
80%	47.3	47.3	47.3	47.2	47.2	47.1	47.1	47.0	47.0	46.9
90%	46.9	46.9	46.8	46.8	46.7	46.6	46.6	46.5	46.3	46.1
100%	45.3									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/4/2020 9:01:00 AM	50.8	73.6	59.0	47.4	53.0	48.4
12/4/2020 9:02:00 AM	49.1	66.2	54.4	46.8	50.6	47.5
12/4/2020 9:03:00 AM	48.7	66.6	55.4	46.6	50.7	47.2
12/4/2020 9:04:00 AM	47.8	65.6	55.4	45.6	50.0	46.4
12/4/2020 9:05:00 AM	49.4	68.1	55.1	46.3	52.6	47.0
12/4/2020 9:06:00 AM	48.5	65.8	54.0	46.3	50.1	46.9
12/4/2020 9:07:00 AM	48.5	66.4	52.2	46.7	50.3	47.4
12/4/2020 9:08:00 AM	49.9	67.1	55.0	46.0	51.6	47.6
12/4/2020 9:09:00 AM	49.1	74.1	59.1	46.2	51.1	47.1
12/4/2020 9:10:00 AM	54.1	76.7	65.2	46.6	56.5	47.9
12/4/2020 9:11:00 AM	51.6	74.2	61.9	46.2	55.7	47.0
12/4/2020	47.5	64.5	55.2	45.6	48.5	46.4

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/4/2020 9:13:00 AM	47.7	64.9	53.4	45.9	48.8	46.7
12/4/2020 9:14:00 AM	50.8	74.4	62.1	46.4	51.4	47.2
12/4/2020 9:15:00 AM	48.5	67.1	52.9	45.8	50.9	46.6
12/4/2020 9:16:00 AM	48.2	63.8	54.0	46.3	49.3	47.1
12/4/2020 9:17:00 AM	49.0	70.5	55.2	46.5	50.6	47.4
12/4/2020 9:18:00 AM	48.7	76.8	54.6	46.7	50.4	47.2
12/4/2020 9:19:00 AM	49.0	67.9	55.0	46.8	50.3	47.8
12/4/2020 9:20:00 AM	49.2	77.2	60.1	47.3	50.4	48.0
12/4/2020 9:21:00 AM	48.3	65.4	53.5	46.3	49.7	47.0
12/4/2020 9:22:00 AM	48.4	65.4	53.9	46.2	50.0	47.0
12/4/2020 9:23:00 AM	49.7	67.7	56.3	47.0	51.7	48.0
12/4/2020 9:24:00 AM	50.4	69.9	57.0	46.5	53.2	47.4
12/4/2020 9:25:00 AM	49.2	71.3	55.8	46.0	50.8	47.0
12/4/2020 9:26:00 AM	50.4	67.3	56.1	46.4	53.5	47.2
12/4/2020 9:27:00 AM	49.5	68.3	54.9	47.3	50.4	48.3
12/4/2020 9:28:00 AM	50.4	69.8	60.8	47.6	50.9	48.5
12/4/2020 9:29:00 AM	50.4	69.7	59.7	46.9	53.0	47.7
12/4/2020 9:30:00 AM	51.8	72.3	59.1	47.3	53.4	50.2
12/4/2020 9:31:00 AM	52.8	72.4	59.2	47.5	54.9	50.5
12/4/2020 9:32:00 AM	49.1	70.6	58.7	46.5	50.4	47.4
12/4/2020 9:33:00 AM	49.2	68.1	55.6	46.5	51.2	47.2
12/4/2020 9:34:00 AM	48.4	69.4	56.5	46.7	49.6	47.3
12/4/2020 9:35:00 AM	48.9	69.3	55.8	46.7	50.7	47.3
12/4/2020 9:36:00 AM	48.9	66.2	56.6	46.3	50.8	47.0
12/4/2020 9:37:00 AM	48.8	71.8	61.3	46.4	50.0	47.0
12/4/2020 9:38:00 AM	47.9	68.0	52.2	45.7	49.4	46.6
12/4/2020 9:39:00 AM	47.5	66.2	53.6	46.0	48.2	46.7
12/4/2020 9:40:00 AM	48.0	72.5	56.4	46.0	49.1	46.8
12/4/2020 9:41:00 AM	49.8	70.7	58.4	46.6	51.7	47.8
12/4/2020 9:42:00 AM	51.6	78.5	63.0	46.9	54.6	47.9
12/4/2020 9:43:00 AM	48.9	67.4	54.3	46.9	50.3	47.6
12/4/2020 9:44:00 AM	50.7	68.7	57.4	47.4	52.6	48.2
12/4/2020 9:45:00 AM	50.4	71.2	58.4	47.1	51.9	48.3
12/4/2020 9:46:00 AM	50.8	69.7	57.5	47.5	52.9	48.3
12/4/2020 9:47:00 AM	52.1	74.1	64.6	46.7	52.8	47.8
12/4/2020 9:48:00 AM	50.2	70.8	60.3	47.9	50.9	48.8
12/4/2020 9:49:00 AM	52.3	71.7	60.9	47.4	54.7	48.4
12/4/2020 9:50:00 AM	49.1	66.6	54.5	46.0	51.6	46.7
12/4/2020	49.5	80.6	60.7	46.2	51.2	47.1

Logged Data Table (cont'd)

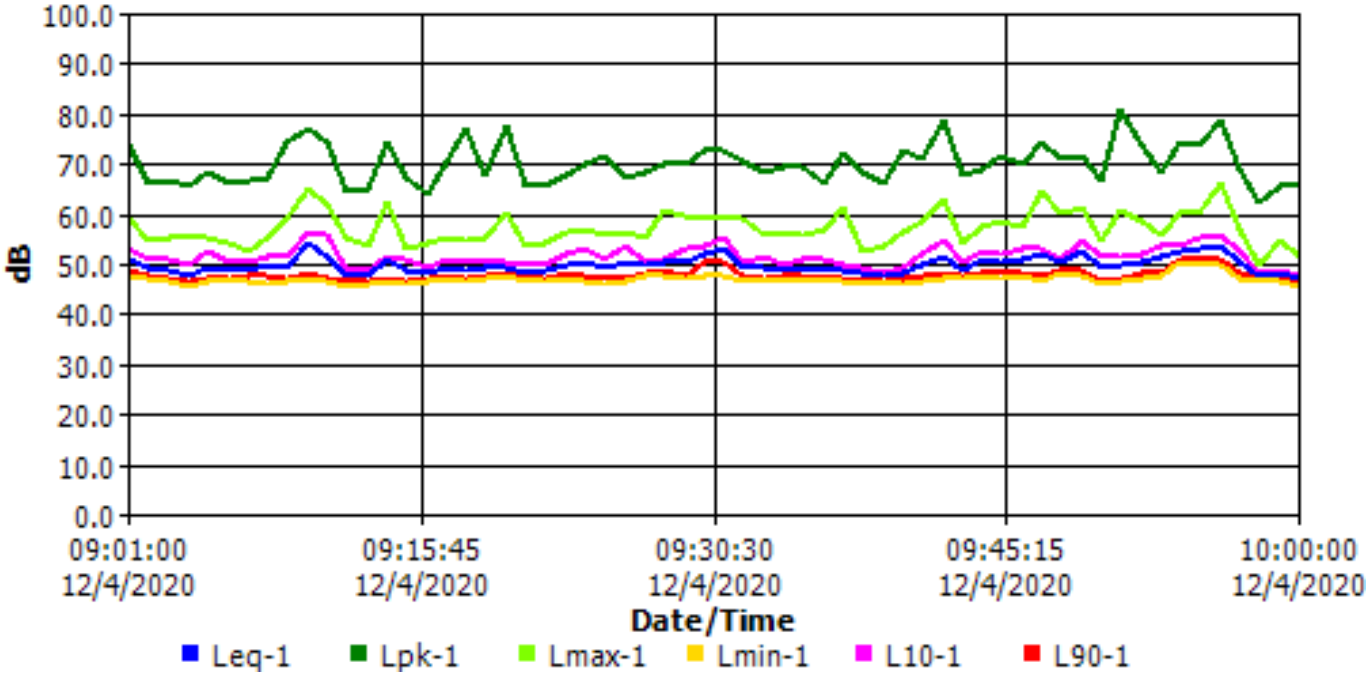
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/4/2020 9:52:00 AM	50.4	73.8	58.6	47.1	52.0	48.2
12/4/2020 9:53:00 AM	51.3	68.1	55.7	47.4	53.4	48.3
12/4/2020 9:54:00 AM	52.2	74.0	60.1	50.1	53.6	51.0
12/4/2020 9:55:00 AM	53.1	73.6	60.1	50.0	55.1	51.4
12/4/2020 9:56:00 AM	53.8	78.5	66.3	50.0	55.6	51.0
12/4/2020 9:57:00 AM	50.4	68.5	56.7	46.9	52.7	47.9
12/4/2020 9:58:00 AM	47.4	62.4	49.7	46.2	48.1	46.9
12/4/2020 9:59:00 AM	47.9	65.6	54.4	46.3	48.9	46.9
12/4/2020 10:00:00 AM	46.8	65.3	51.3	45.4	47.7	46.1

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	80.6 dB
Lmax	1	66.3 dB	Lmin	1	45.4 dB
Leq	1	50 dB	TWA	1	41 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

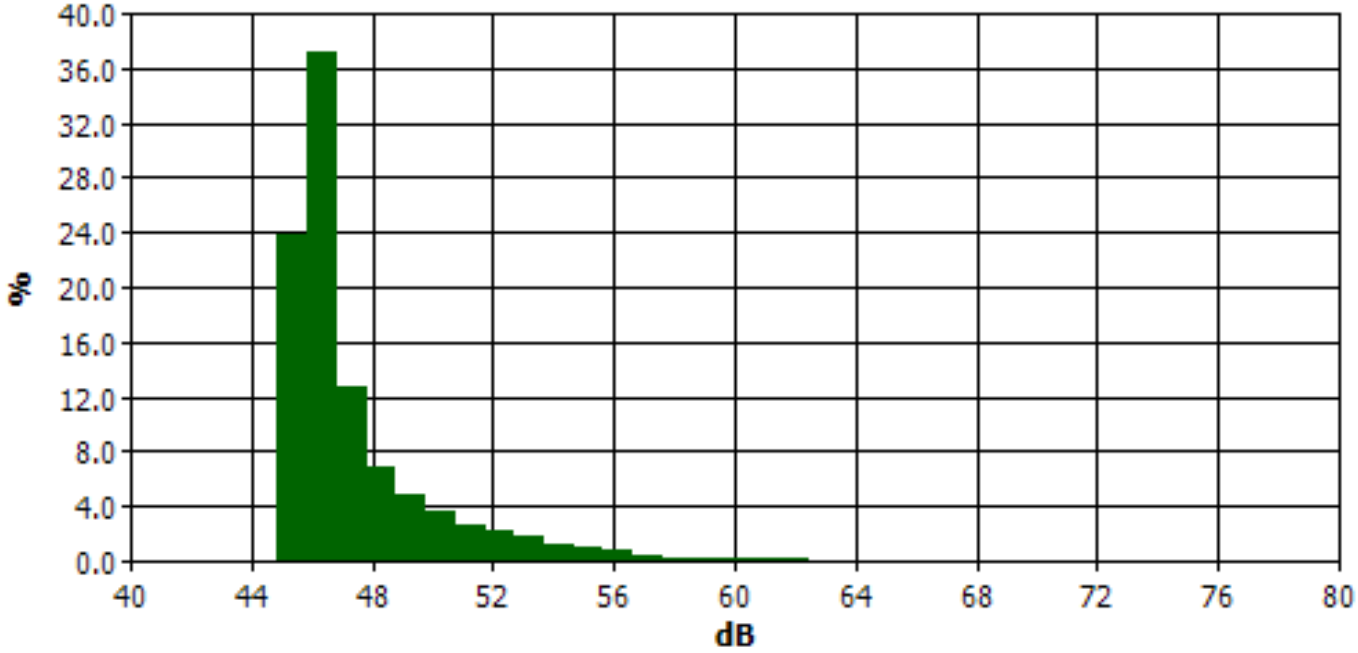
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK / EV103 - 792 / 2020
Location	N3 - Night time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Thursday, December 03, 2020 21:04:00
Stop Time	Thursday, December 03, 2020 22:04:00
User Name	JS
Comments	Vehicles movement , human activities , domestic animals , insects.

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	49.4 dB	Dose	1	0 %
Lmin	1	44.7 dB	Lmax	1	73 dB
Lpk	1	93 dB	TWA	1	40.4 dB
L1	1	57.6 dB	L10	1	51.2 dB
L50	1	46.4 dB	L90	1	45.6 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



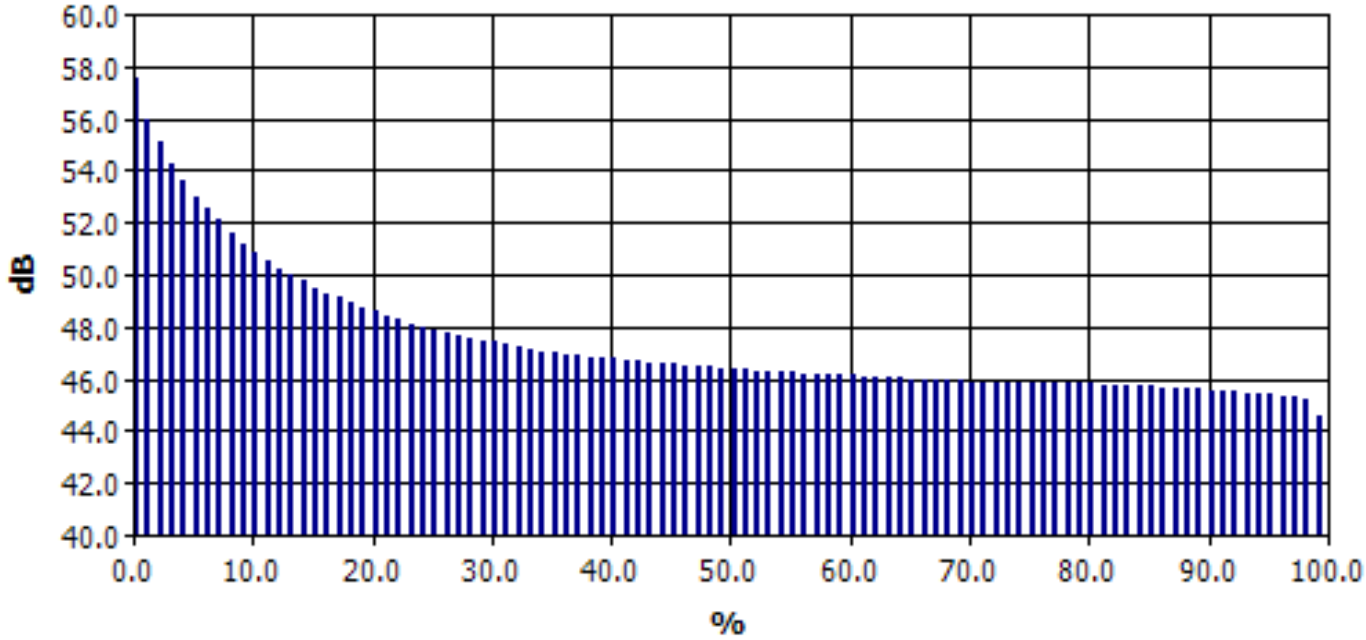
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
45.0	0.1	0.3	0.6	1.0	1.7	2.5	3.5	4.2	4.8	5.2	23.9
46.0	5.2	5.1	4.8	4.4	3.9	3.4	3.0	2.8	2.4	2.2	37.1
47.0	2.0	1.8	1.1	1.4	1.2	1.2	1.1	1.0	1.0	0.9	12.7
48.0	0.9	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	6.8
49.0	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	4.8
50.0	0.5	0.5	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	3.6
51.0	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	2.5
52.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.1
53.0	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	1.7
54.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.3
55.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1
56.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
57.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.5
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		57.6	56.0	55.1	54.3	53.6	53.0	52.5	52.1	51.6
10%	51.2	50.8	50.5	50.2	50.0	49.8	49.5	49.3	49.1	48.9
20%	48.7	48.6	48.4	48.3	48.1	48.0	47.9	47.8	47.7	47.6
30%	47.5	47.4	47.3	47.2	47.1	47.0	47.0	46.9	46.9	46.8
40%	46.8	46.8	46.7	46.7	46.6	46.6	46.6	46.5	46.5	46.5
50%	46.4	46.4	46.4	46.3	46.3	46.3	46.3	46.2	46.2	46.2
60%	46.2	46.2	46.1	46.1	46.1	46.1	46.0	46.0	46.0	46.0
70%	46.0	45.9	45.9	45.9	45.9	45.9	45.9	45.8	45.8	45.8
80%	45.8	45.8	45.7	45.7	45.7	45.7	45.7	45.6	45.6	45.6
90%	45.6	45.5	45.5	45.5	45.4	45.4	45.4	45.3	45.3	45.2
100%	44.6									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/3/2020 9:05:00 PM	51.7	93.0	69.0	46.3	51.5	46.9
12/3/2020 9:06:00 PM	50.4	81.2	58.7	46.2	53.8	46.9
12/3/2020 9:07:00 PM	50.7	76.2	62.3	46.8	52.8	47.6
12/3/2020 9:08:00 PM	56.4	87.4	72.4	45.1	55.3	46.4
12/3/2020 9:09:00 PM	51.4	83.0	65.1	45.0	54.4	46.1
12/3/2020 9:10:00 PM	51.7	88.8	72.2	45.0	52.2	45.9
12/3/2020 9:11:00 PM	53.1	76.2	62.4	46.1	55.8	48.2
12/3/2020	50.6	69.4	56.8	46.6	54.0	47.3

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/3/2020 9:13:00 PM	47.4	67.3	53.5	45.6	48.4	46.4
12/3/2020 9:14:00 PM	47.9	69.3	55.6	45.3	50.4	46.0
12/3/2020 9:15:00 PM	46.2	62.0	52.0	45.1	46.9	45.7
12/3/2020 9:16:00 PM	46.2	63.4	48.3	45.1	46.8	45.8
12/3/2020 9:17:00 PM	46.9	68.0	51.9	45.0	48.5	45.9
12/3/2020 9:18:00 PM	49.3	72.0	58.8	45.4	52.3	46.1
12/3/2020 9:19:00 PM	49.5	68.3	55.5	45.6	51.1	47.3
12/3/2020 9:20:00 PM	51.9	71.3	58.8	45.6	55.1	46.5
12/3/2020 9:21:00 PM	54.0	71.5	60.6	45.6	56.8	46.6
12/3/2020 9:22:00 PM	50.0	72.1	58.5	45.2	54.3	46.0
12/3/2020 9:23:00 PM	52.1	76.5	62.4	45.5	56.7	46.3
12/3/2020 9:24:00 PM	51.0	71.3	60.1	45.4	55.6	46.5
12/3/2020 9:25:00 PM	47.3	70.3	57.4	44.9	48.6	45.7
12/3/2020 9:26:00 PM	47.3	68.4	53.7	44.8	50.1	45.5
12/3/2020 9:27:00 PM	47.5	68.7	54.6	45.0	49.5	45.6
12/3/2020 9:28:00 PM	54.3	82.9	66.5	45.7	56.0	47.9
12/3/2020 9:29:00 PM	48.4	69.5	53.4	45.4	50.3	46.6
12/3/2020 9:30:00 PM	49.0	72.8	60.1	44.8	50.6	46.1
12/3/2020 9:31:00 PM	46.8	73.0	57.9	45.1	48.3	45.7
12/3/2020 9:32:00 PM	46.1	63.1	50.2	44.9	46.8	45.6
12/3/2020 9:33:00 PM	47.5	66.2	54.3	45.0	49.8	45.8
12/3/2020 9:34:00 PM	47.8	77.6	61.4	45.2	49.9	46.1
12/3/2020 9:35:00 PM	47.2	68.2	55.8	45.4	48.3	46.0
12/3/2020 9:36:00 PM	46.5	68.6	52.9	45.1	47.0	45.8
12/3/2020 9:37:00 PM	46.5	68.2	52.3	45.0	47.1	45.9
12/3/2020 9:38:00 PM	49.7	82.8	67.5	45.3	48.8	45.9
12/3/2020 9:39:00 PM	54.5	75.5	63.8	45.8	59.0	46.9
12/3/2020 9:40:00 PM	46.4	62.6	49.5	45.5	47.0	46.1
12/3/2020 9:41:00 PM	46.5	68.2	53.4	45.5	47.0	46.0
12/3/2020 9:42:00 PM	46.2	66.0	49.1	45.4	46.9	45.9
12/3/2020 9:43:00 PM	47.1	65.2	53.5	45.4	48.3	46.0
12/3/2020 9:44:00 PM	46.3	62.6	50.1	45.1	47.1	45.7
12/3/2020 9:45:00 PM	46.1	65.8	52.2	45.0	46.7	45.6
12/3/2020 9:46:00 PM	48.8	70.7	57.4	45.0	52.5	45.7
12/3/2020 9:47:00 PM	47.5	66.4	54.0	45.1	49.5	45.7
12/3/2020 9:48:00 PM	46.7	66.6	53.6	44.9	47.3	45.5
12/3/2020 9:49:00 PM	47.2	65.3	53.5	45.4	48.1	46.2
12/3/2020 9:50:00 PM	45.8	61.7	48.5	44.7	46.4	45.4
12/3/2020	46.1	62.4	48.6	44.9	46.9	45.5

Logged Data Table (cont'd)

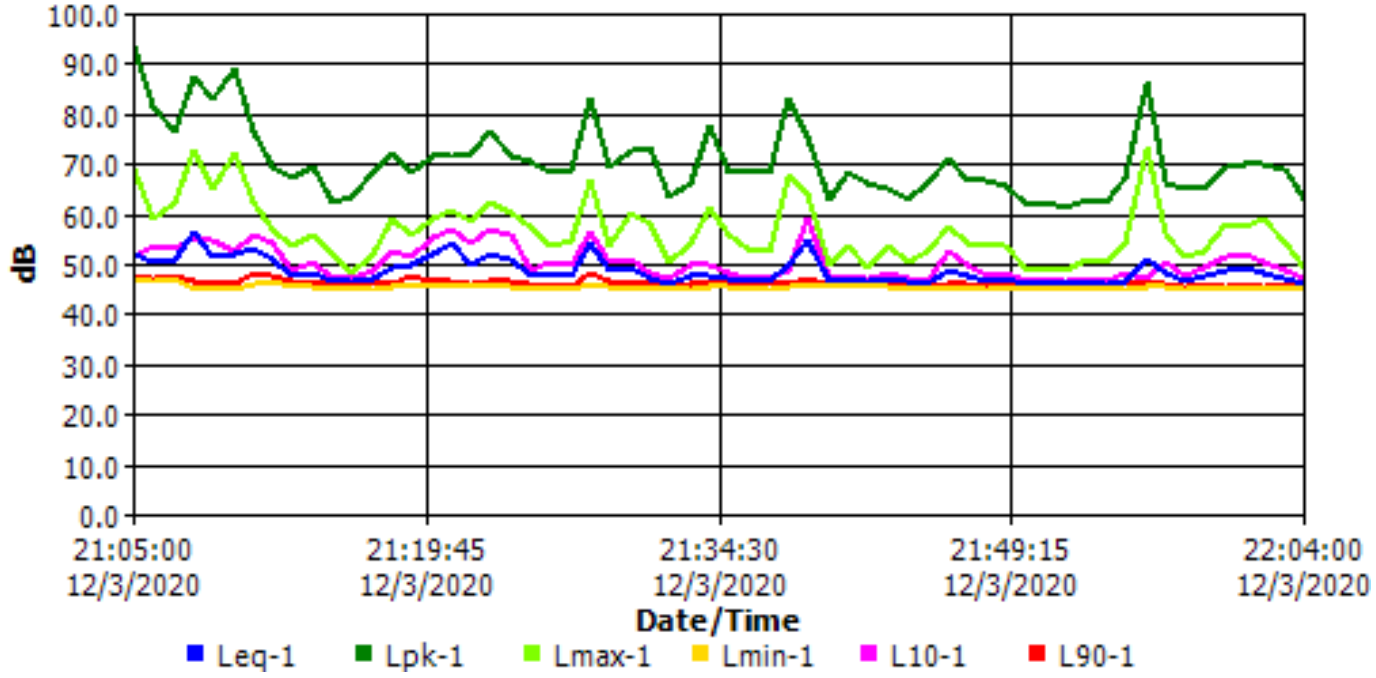
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/3/2020 9:52:00 PM	45.8	61.1	48.9	45.0	46.4	45.5
12/3/2020 9:53:00 PM	46.0	62.7	50.7	45.0	46.8	45.5
12/3/2020 9:54:00 PM	46.1	62.4	50.3	45.1	46.6	45.7
12/3/2020 9:55:00 PM	46.7	66.9	53.9	45.1	48.2	45.7
12/3/2020 9:56:00 PM	50.8	86.2	73.0	45.2	47.2	45.8
12/3/2020 9:57:00 PM	48.0	66.0	55.8	45.3	50.2	46.1
12/3/2020 9:58:00 PM	46.5	64.8	51.2	44.9	47.7	45.6
12/3/2020 9:59:00 PM	47.5	65.1	52.5	45.5	49.4	46.0
12/3/2020 10:00:00 PM	48.8	69.5	58.0	45.0	51.6	45.5
12/3/2020 10:01:00 PM	49.0	70.1	57.6	45.1	51.9	45.7
12/3/2020 10:02:00 PM	48.3	69.8	58.7	44.9	50.2	45.6
12/3/2020 10:03:00 PM	47.2	68.6	54.3	45.0	48.7	45.7
12/3/2020 10:04:00 PM	46.0	62.9	49.2	44.7	47.1	45.2

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	93 dB
Lmax	1	73 dB	Lmin	1	44.7 dB
Leq	1	49.4 dB	TWA	1	40.4 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

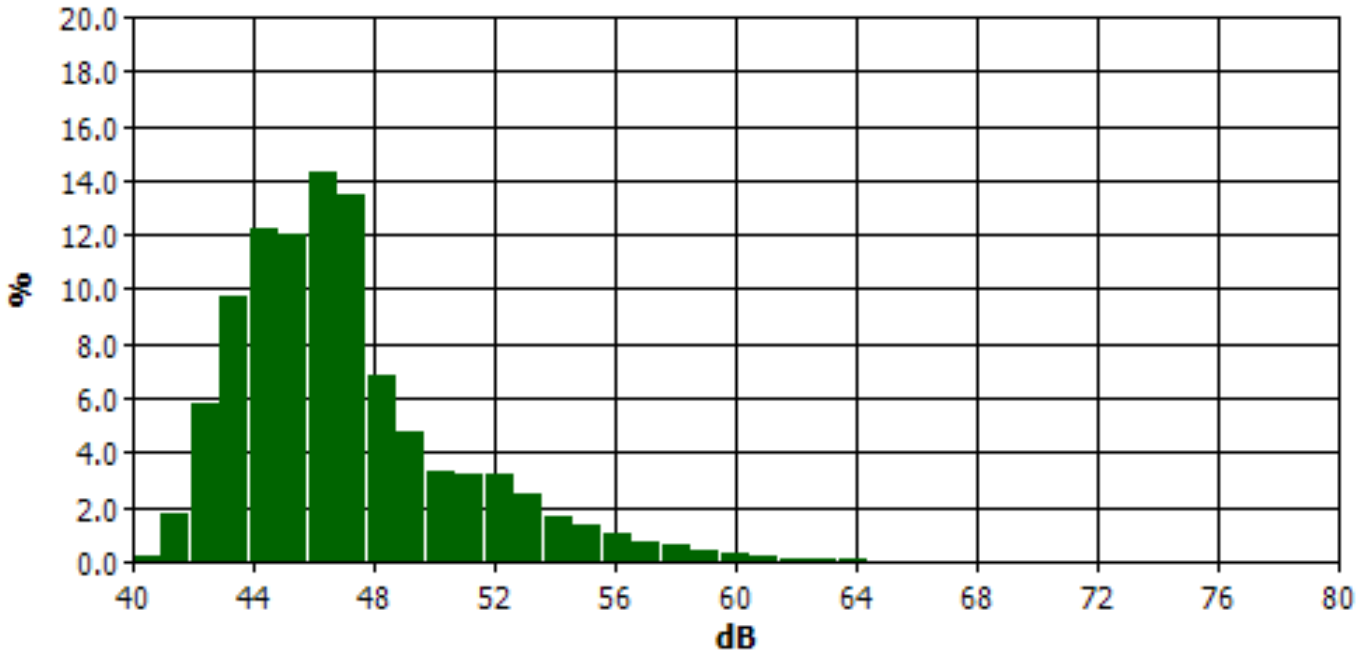
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK/ EV103 - 792 / 2020
Location	N4 - Day time
Device Serial Number	BJK090002
Start Time	Sunday, December 06, 2020 10:36:20
Stop Time	Sunday, December 06, 2020 11:36:20
User Name	JS
Comments	Human activities , domestic animals , boats movement , insects.

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	50.2 dB	Dose	1	0 %
Lmin	1	40.2 dB	Lmax	1	78.4 dB
Lpk	1	94.3 dB	TWA	1	41.1 dB
L1	1	59.7 dB	L10	1	52.6 dB
L50	1	46.5 dB	L90	1	43.1 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



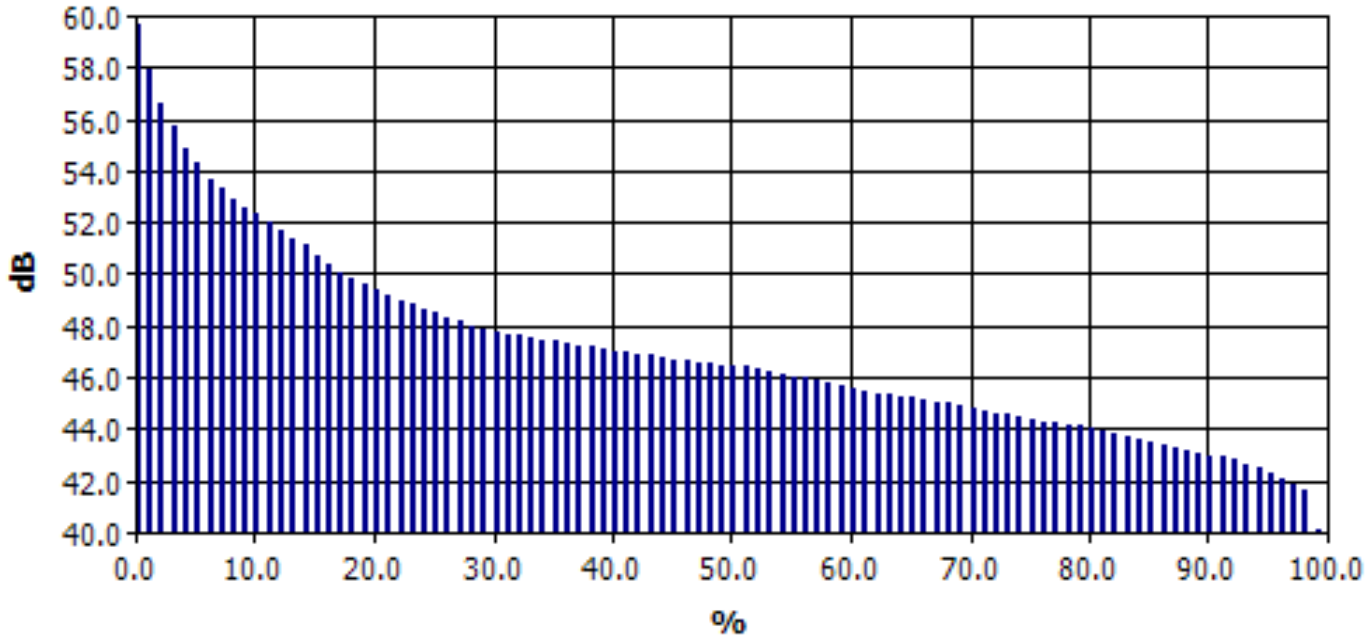
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
41.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	1.7
42.0	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.8	5.8
43.0	0.8	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	9.8
44.0	1.3	1.1	1.0	1.2	1.2	1.3	1.3	1.3	1.3	1.3	12.2
45.0	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	12.0
46.0	1.1	1.2	1.2	1.3	1.3	1.5	1.6	1.6	1.7	1.8	14.3
47.0	1.8	1.8	1.1	1.5	1.5	1.4	1.2	1.1	1.0	1.0	13.5
48.0	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	6.8
49.0	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	4.8
50.0	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	3.3
51.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	3.2
52.0	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.2
53.0	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	2.5
54.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	1.7
55.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.3
56.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
57.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
58.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.6
59.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		59.7	57.9	56.6	55.7	54.9	54.3	53.7	53.3	52.9
10%	52.6	52.3	52.0	51.7	51.4	51.1	50.7	50.4	50.1	49.8
20%	49.6	49.4	49.2	49.0	48.8	48.6	48.5	48.3	48.2	48.0
30%	47.9	47.8	47.7	47.6	47.5	47.4	47.4	47.3	47.2	47.2
40%	47.1	47.0	47.0	46.9	46.9	46.8	46.7	46.7	46.6	46.6
50%	46.5	46.4	46.4	46.3	46.2	46.1	46.0	46.0	45.9	45.8
60%	45.7	45.6	45.5	45.4	45.4	45.3	45.2	45.1	45.0	45.0
70%	44.9	44.8	44.7	44.6	44.6	44.5	44.4	44.3	44.3	44.2
80%	44.1	44.0	43.9	43.8	43.7	43.6	43.5	43.4	43.3	43.2
90%	43.1	43.0	42.9	42.8	42.6	42.5	42.3	42.1	41.9	41.6
100%	40.1									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/6/2020 10:37:20 AM	52.8	79.6	61.9	50.1	54.4	51.4
12/6/2020 10:38:20 AM	50.6	79.9	65.0	42.0	53.5	43.4
12/6/2020 10:39:20 AM	44.8	59.6	48.7	42.1	46.3	43.4
12/6/2020 10:40:20 AM	43.7	62.0	48.9	40.5	45.7	41.9
12/6/2020 10:41:20 AM	43.6	59.5	49.0	40.2	45.7	41.5
12/6/2020 10:42:20 AM	46.1	63.5	54.1	40.7	49.4	42.7
12/6/2020 10:43:20 AM	44.7	60.7	49.1	40.7	46.5	42.3
12/6/2020 10:44:20 AM	46.3	62.9	51.4	43.3	47.8	44.8

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/6/2020 10:46:20 AM	46.5	63.1	51.2	43.5	48.5	44.6
12/6/2020 10:47:20 AM	46.9	63.5	53.2	44.8	48.2	45.7
12/6/2020 10:48:20 AM	45.4	61.1	52.0	43.1	46.3	44.3
12/6/2020 10:49:20 AM	45.9	61.7	50.3	43.6	47.3	44.7
12/6/2020 10:50:20 AM	49.5	66.5	55.9	43.9	52.6	45.4
12/6/2020 10:51:20 AM	46.1	63.3	49.5	43.6	47.8	44.6
12/6/2020 10:52:20 AM	44.2	59.6	48.1	41.7	45.3	43.0
12/6/2020 10:53:20 AM	56.9	80.5	71.9	41.7	59.7	43.9
12/6/2020 10:54:20 AM	45.7	65.3	57.3	40.5	48.7	42.2
12/6/2020 10:55:20 AM	46.4	66.2	56.6	40.5	49.6	42.4
12/6/2020 10:56:20 AM	53.7	73.7	66.2	42.5	58.8	44.6
12/6/2020 10:57:20 AM	55.7	79.0	72.5	40.2	53.2	42.2
12/6/2020 10:58:20 AM	46.0	68.7	54.1	40.8	48.4	42.5
12/6/2020 10:59:20 AM	47.1	65.1	55.2	41.1	49.8	43.1
12/6/2020 11:00:20 AM	49.3	68.1	58.7	42.1	52.9	43.9
12/6/2020 11:01:20 AM	47.1	75.2	63.5	41.1	49.3	43.1
12/6/2020 11:02:20 AM	49.6	68.4	60.3	40.9	53.4	43.1
12/6/2020 11:03:20 AM	47.0	71.7	59.5	42.0	49.1	43.9
12/6/2020 11:04:20 AM	46.4	68.3	58.8	41.3	49.4	42.7
12/6/2020 11:05:20 AM	46.0	64.8	55.0	40.8	48.5	42.8
12/6/2020 11:06:20 AM	47.2	71.3	61.3	41.7	49.6	43.3
12/6/2020 11:07:20 AM	45.3	66.6	58.3	40.2	46.7	42.2
12/6/2020 11:08:20 AM	45.6	68.6	57.4	40.6	47.1	42.9
12/6/2020 11:09:20 AM	46.0	69.2	56.8	40.4	48.4	42.2
12/6/2020 11:10:20 AM	48.4	67.9	60.4	42.0	51.0	43.7
12/6/2020 11:11:20 AM	45.4	62.0	52.4	40.9	48.7	42.4
12/6/2020 11:12:20 AM	46.4	67.1	57.3	40.9	49.1	42.5
12/6/2020 11:13:20 AM	47.7	76.0	64.9	41.9	49.1	43.8
12/6/2020 11:14:20 AM	46.9	65.3	58.5	40.8	49.4	43.1
12/6/2020 11:15:20 AM	47.2	65.1	56.0	42.2	50.6	43.8
12/6/2020 11:16:20 AM	46.6	64.1	53.7	42.1	48.9	43.7
12/6/2020 11:17:20 AM	50.2	71.0	58.1	44.0	52.9	45.6
12/6/2020 11:18:20 AM	48.9	64.5	58.3	42.2	52.0	44.2
12/6/2020 11:19:20 AM	47.0	71.7	56.6	40.5	49.3	42.8
12/6/2020 11:20:20 AM	53.3	85.0	66.4	44.6	55.2	46.9
12/6/2020 11:21:20 AM	51.1	85.9	67.9	45.8	53.1	46.6
12/6/2020 11:22:20 AM	54.7	94.3	78.4	45.3	50.1	46.2
12/6/2020 11:23:20 AM	50.1	75.3	66.2	45.6	52.5	46.7
12/6/2020	50.7	76.3	63.2	46.5	53.1	47.3

Logged Data Table (cont'd)

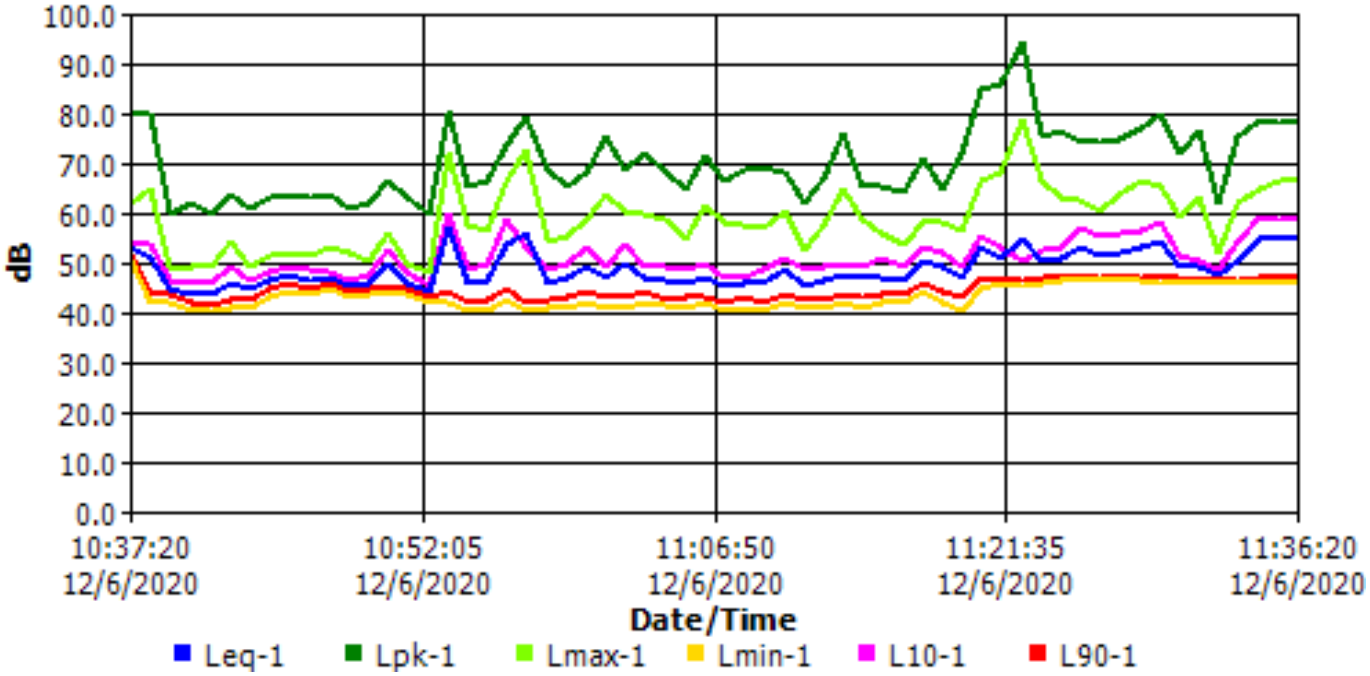
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/6/2020 11:25:20 AM	53.1	73.9	62.5	46.4	56.7	47.1
12/6/2020 11:26:20 AM	51.5	74.4	60.5	46.6	55.5	47.2
12/6/2020 11:27:20 AM	52.2	74.7	63.8	46.6	55.9	47.4
12/6/2020 11:28:20 AM	52.9	77.0	66.2	46.3	56.5	47.2
12/6/2020 11:29:20 AM	54.1	79.9	65.5	46.1	57.8	47.5
12/6/2020 11:30:20 AM	49.2	71.8	58.9	46.2	51.5	47.0
12/6/2020 11:31:20 AM	49.2	76.4	63.3	45.9	50.3	46.6
12/6/2020 11:32:20 AM	47.3	61.8	51.9	45.9	48.6	46.6
12/6/2020 11:33:20 AM	50.5	75.3	61.8	45.7	54.2	46.6
12/6/2020 11:34:20 AM	54.9	78.8	65.0	45.7	59.0	46.8
12/6/2020 11:35:20 AM	55.0	78.3	66.5	45.6	58.8	46.8
12/6/2020 11:36:20 AM	54.6	78.6	66.7	45.9	59.1	47.2

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	94.3 dB
Lmax	1	78.4 dB	Lmin	1	40.2 dB
Leq	1	50.2 dB	TWA	1	41.1 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

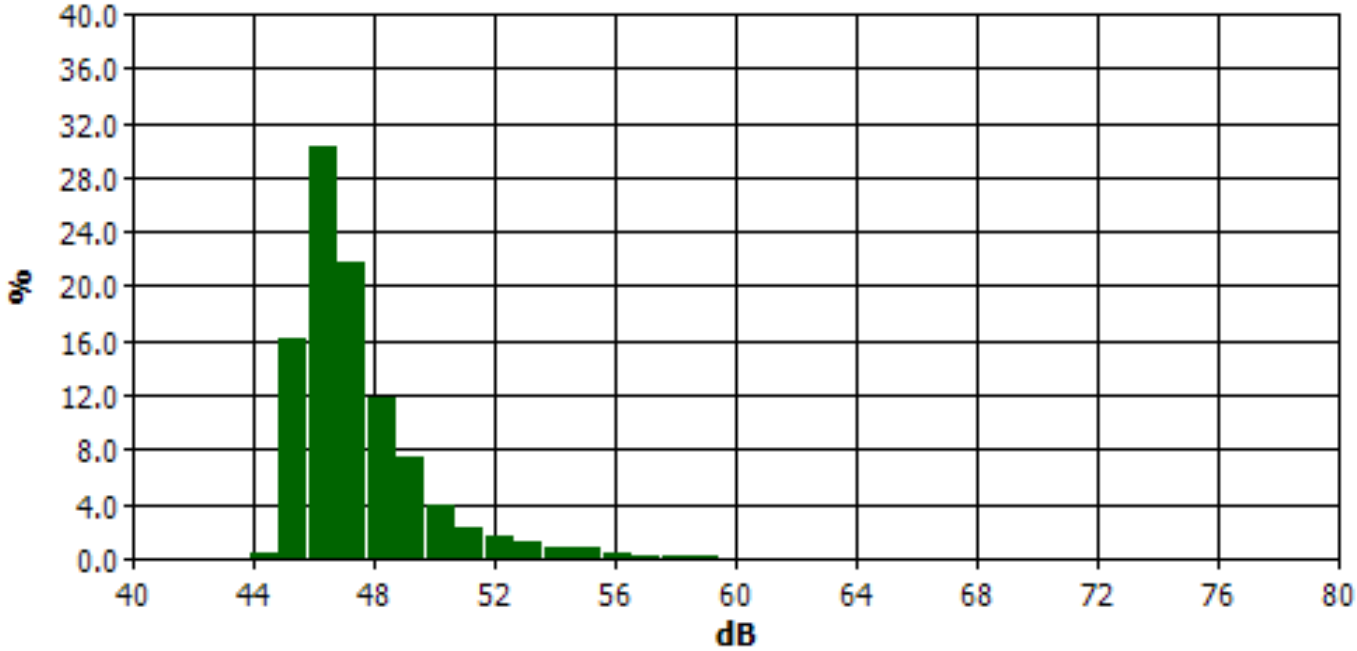
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK/ EV103 - 792 /2020
Location	N4 - Night time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Sunday, December 06, 2020 21:11:19
Stop Time	Sunday, December 06, 2020 22:11:19
User Name	JS
Comments	Domestic animals , insects , human activities .

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	48.9 dB	Dose	1	0 %
Lmin	1	44.3 dB	Lmax	1	74.1 dB
Lpk	1	91.1 dB	TWA	1	39.9 dB
L1	1	56.8 dB	L10	1	50.3 dB
L50	1	46.9 dB	L90	1	45.6 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



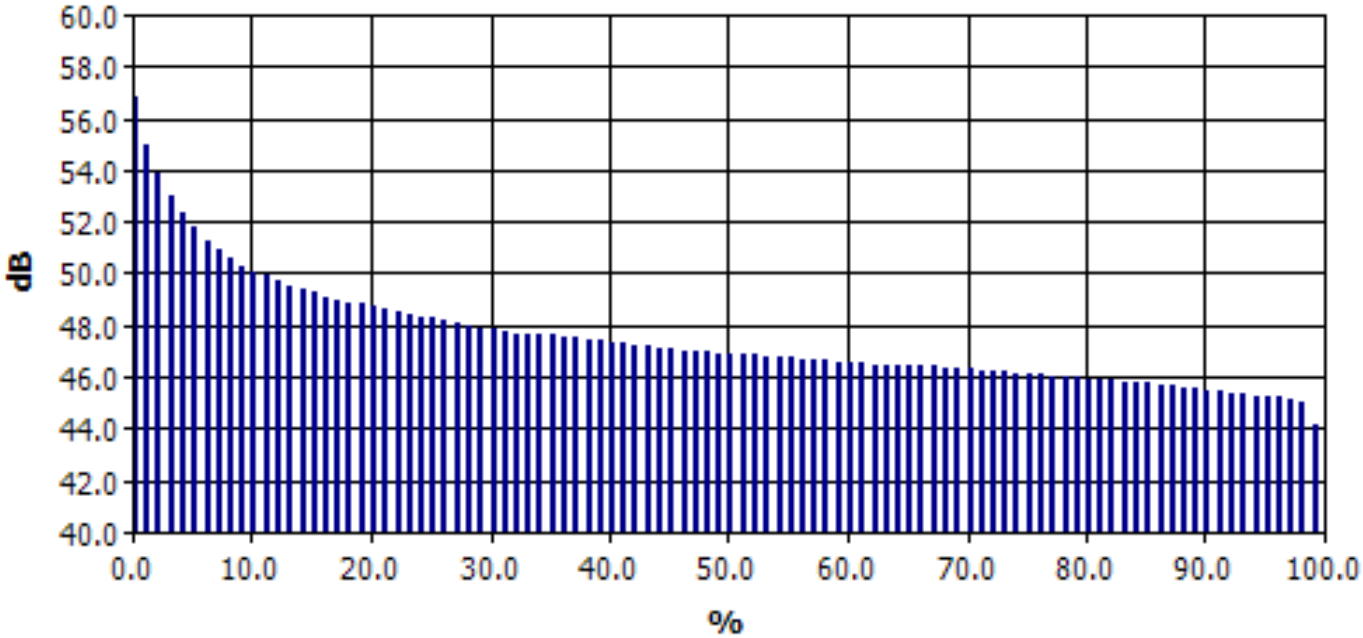
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4
45.0	0.4	0.6	1.0	1.3	1.6	1.8	2.1	2.3	2.5	2.7	16.2
46.0	2.8	2.9	2.9	3.0	3.1	3.2	3.1	3.1	3.1	3.1	30.3
47.0	3.2	3.1	1.8	2.4	2.2	2.0	1.9	1.8	1.7	1.5	21.7
48.0	1.4	1.3	1.3	1.2	1.2	1.1	1.2	1.1	1.1	1.0	11.8
49.0	1.0	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	7.4
50.0	0.6	0.6	0.3	0.5	0.4	0.4	0.4	0.3	0.3	0.3	4.0
51.0	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.3
52.0	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	1.6
53.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
54.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
55.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
56.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		56.8	55.0	53.9	53.0	52.3	51.8	51.3	50.9	50.6
10%	50.3	50.0	49.9	49.7	49.5	49.4	49.3	49.1	49.0	48.9
20%	48.8	48.7	48.6	48.5	48.4	48.3	48.3	48.2	48.1	48.0
30%	47.9	47.9	47.8	47.7	47.7	47.6	47.6	47.5	47.5	47.4
40%	47.4	47.3	47.3	47.2	47.2	47.1	47.1	47.0	47.0	47.0
50%	46.9	46.9	46.9	46.9	46.8	46.8	46.8	46.7	46.7	46.7
60%	46.6	46.6	46.6	46.5	46.5	46.5	46.4	46.4	46.4	46.3
70%	46.3	46.3	46.2	46.2	46.2	46.1	46.1	46.1	46.0	46.0
80%	46.0	45.9	45.9	45.9	45.8	45.8	45.8	45.7	45.7	45.6
90%	45.6	45.5	45.5	45.4	45.4	45.3	45.3	45.2	45.1	45.0
100%	44.2									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/6/2020 9:12:19 PM	53.0	91.0	74.1	45.5	54.1	46.7
12/6/2020 9:13:19 PM	49.4	68.5	56.6	45.8	51.7	46.7
12/6/2020 9:14:19 PM	49.0	68.4	56.8	46.5	50.8	47.2
12/6/2020 9:15:19 PM	49.8	68.1	58.0	45.7	52.2	47.2
12/6/2020 9:16:19 PM	52.9	86.1	67.2	45.1	55.6	46.5
12/6/2020 9:17:19 PM	47.6	75.0	58.6	44.9	49.5	45.6
12/6/2020 9:18:19 PM	48.8	81.3	65.0	44.5	50.7	45.3
12/6/2020	48.9	65.8	56.6	45.2	52.0	46.1

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/6/2020 9:20:19 PM	47.8	61.8	49.9	46.2	48.6	47.1
12/6/2020 9:21:19 PM	49.6	68.7	56.5	47.8	50.8	48.6
12/6/2020 9:22:19 PM	49.8	79.7	65.0	47.7	50.3	48.5
12/6/2020 9:23:19 PM	49.8	75.9	57.9	45.9	51.6	47.1
12/6/2020 9:24:19 PM	48.0	80.6	61.6	45.1	49.2	46.1
12/6/2020 9:25:19 PM	47.4	67.3	57.4	44.9	49.5	45.6
12/6/2020 9:26:19 PM	46.6	68.4	51.5	45.1	47.5	45.9
12/6/2020 9:27:19 PM	51.7	85.8	65.7	45.4	54.1	46.7
12/6/2020 9:28:19 PM	47.3	79.1	61.5	44.9	47.6	45.9
12/6/2020 9:29:19 PM	51.7	85.5	65.9	45.7	54.6	46.7
12/6/2020 9:30:19 PM	49.6	84.0	65.8	45.5	51.4	46.2
12/6/2020 9:31:19 PM	48.9	74.8	59.8	45.6	50.4	46.6
12/6/2020 9:32:19 PM	48.8	69.9	59.0	45.5	51.2	46.3
12/6/2020 9:33:19 PM	46.9	63.0	51.6	44.5	48.8	45.4
12/6/2020 9:34:19 PM	46.6	68.9	56.1	44.4	48.1	45.3
12/6/2020 9:35:19 PM	46.2	62.6	49.4	44.4	47.2	45.4
12/6/2020 9:36:19 PM	49.1	68.9	59.9	45.2	50.6	46.2
12/6/2020 9:37:19 PM	49.0	69.0	60.0	45.2	51.2	45.9
12/6/2020 9:38:19 PM	46.4	62.7	53.8	44.7	47.6	45.5
12/6/2020 9:39:19 PM	45.8	60.3	48.1	44.6	46.6	45.4
12/6/2020 9:40:19 PM	47.0	72.3	60.3	44.8	47.7	45.5
12/6/2020 9:41:19 PM	47.1	65.4	53.5	44.7	48.9	45.5
12/6/2020 9:42:19 PM	49.0	71.0	57.7	45.8	51.4	46.6
12/6/2020 9:43:19 PM	49.4	80.2	63.8	45.7	50.0	46.5
12/6/2020 9:44:19 PM	48.7	66.5	57.0	46.4	50.6	47.0
12/6/2020 9:45:19 PM	48.2	69.3	55.1	46.1	49.6	46.8
12/6/2020 9:46:19 PM	47.8	62.0	51.6	45.8	49.5	46.8
12/6/2020 9:47:19 PM	50.2	82.0	64.6	46.0	52.1	46.6
12/6/2020 9:48:19 PM	47.8	62.8	51.2	46.0	49.3	46.8
12/6/2020 9:49:19 PM	46.9	65.7	52.2	45.3	47.8	46.1
12/6/2020 9:50:19 PM	48.4	85.0	67.3	45.6	48.3	46.4
12/6/2020 9:51:19 PM	47.8	77.9	61.9	45.7	48.3	46.4
12/6/2020 9:52:19 PM	48.6	65.9	54.2	45.9	51.1	46.8
12/6/2020 9:53:19 PM	49.0	78.9	61.7	46.0	50.2	47.0
12/6/2020 9:54:19 PM	50.5	84.5	62.9	46.4	52.7	47.1
12/6/2020 9:55:19 PM	51.5	78.1	60.9	46.5	55.4	47.2
12/6/2020 9:56:19 PM	47.8	67.6	53.0	45.9	49.3	46.7
12/6/2020 9:57:19 PM	47.6	74.9	60.4	45.4	48.7	46.3
12/6/2020	47.8	75.1	61.5	45.3	48.8	45.9

Logged Data Table (cont'd)

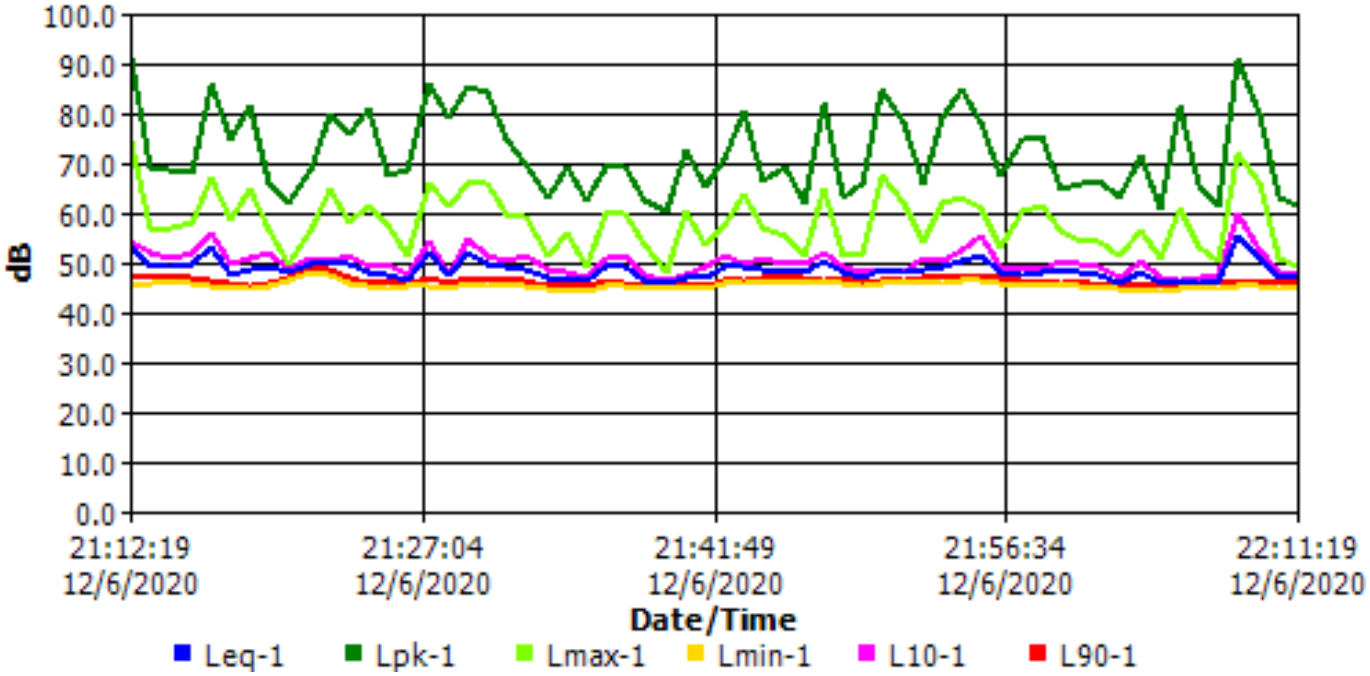
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/6/2020 9:59:19 PM	47.8	64.6	56.5	45.4	50.3	46.0
12/6/2020 10:00:19 PM	48.1	65.7	54.3	45.3	49.9	46.3
12/6/2020 10:01:19 PM	47.4	66.4	54.2	44.7	49.3	45.4
12/6/2020 10:02:19 PM	46.1	62.8	51.6	44.5	47.2	45.3
12/6/2020 10:03:19 PM	48.0	71.4	56.5	44.3	50.2	45.4
12/6/2020 10:04:19 PM	46.1	60.6	50.7	44.3	47.0	45.3
12/6/2020 10:05:19 PM	46.4	81.3	60.6	44.5	46.6	45.2
12/6/2020 10:06:19 PM	46.1	65.1	52.9	44.8	46.7	45.6
12/6/2020 10:07:19 PM	46.5	61.5	50.2	44.9	47.4	45.8
12/6/2020 10:08:19 PM	55.4	91.1	71.8	45.3	59.7	46.1
12/6/2020 10:09:19 PM	50.6	80.0	65.8	45.2	52.3	46.1
12/6/2020 10:10:19 PM	46.8	62.9	50.9	45.0	47.8	45.8
12/6/2020 10:11:19 PM	46.8	61.4	49.3	45.3	47.7	46.1

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	91.1 dB
Lmax	1	74.1 dB	Lmin	1	44.3 dB
Leq	1	48.9 dB	TWA	1	39.9 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

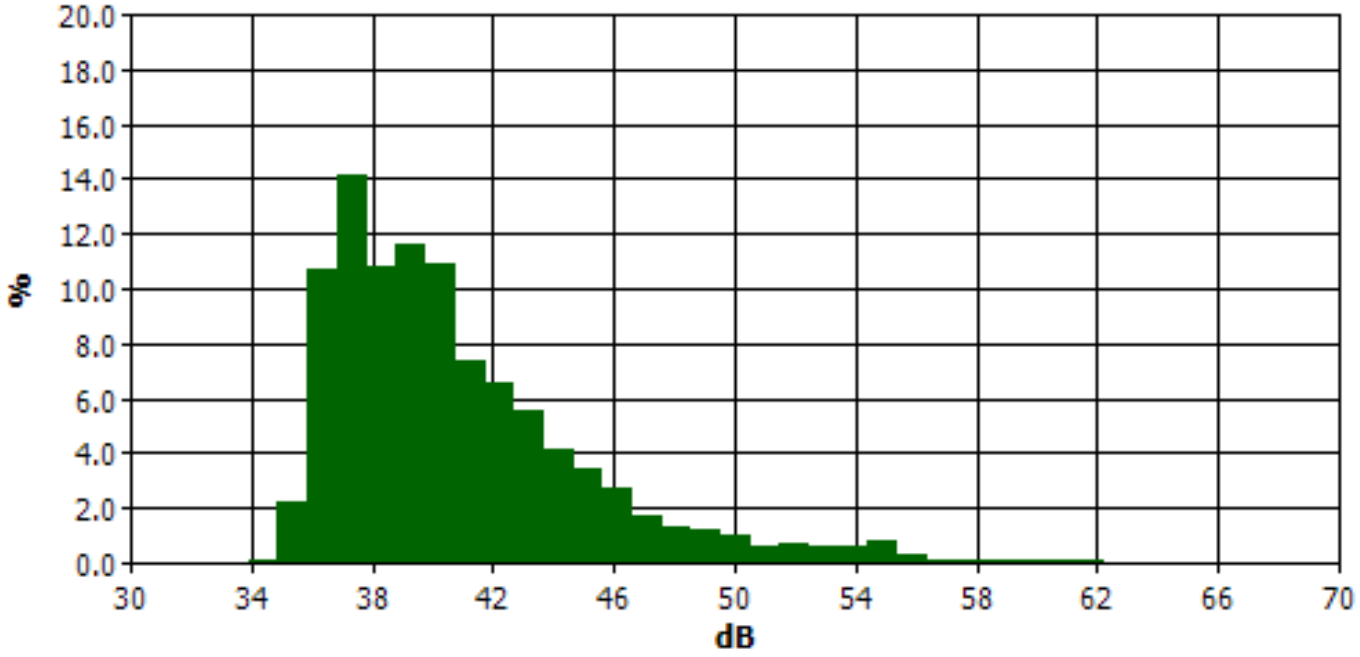
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK / EV103 - 792 /2020
Location	N 5 - Day time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Friday, December 04, 2020 16:00:00
Stop Time	Friday, December 04, 2020 17:00:00
User Name	JS
Comments	Domestic animals , human activities , boats movement , vehicles movement .

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lmin	1	34.2 dB
Lmax	1	68.9 dB	Lpk	1	84.4 dB
Leq	1	45.1 dB	TWA	1	36.1 dB
UR%	1	0.1 %	L1	1	55.8 dB
L10	1	46.7 dB	L50	1	39.9 dB
L90	1	36.6 dB	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF			

Statistics Chart



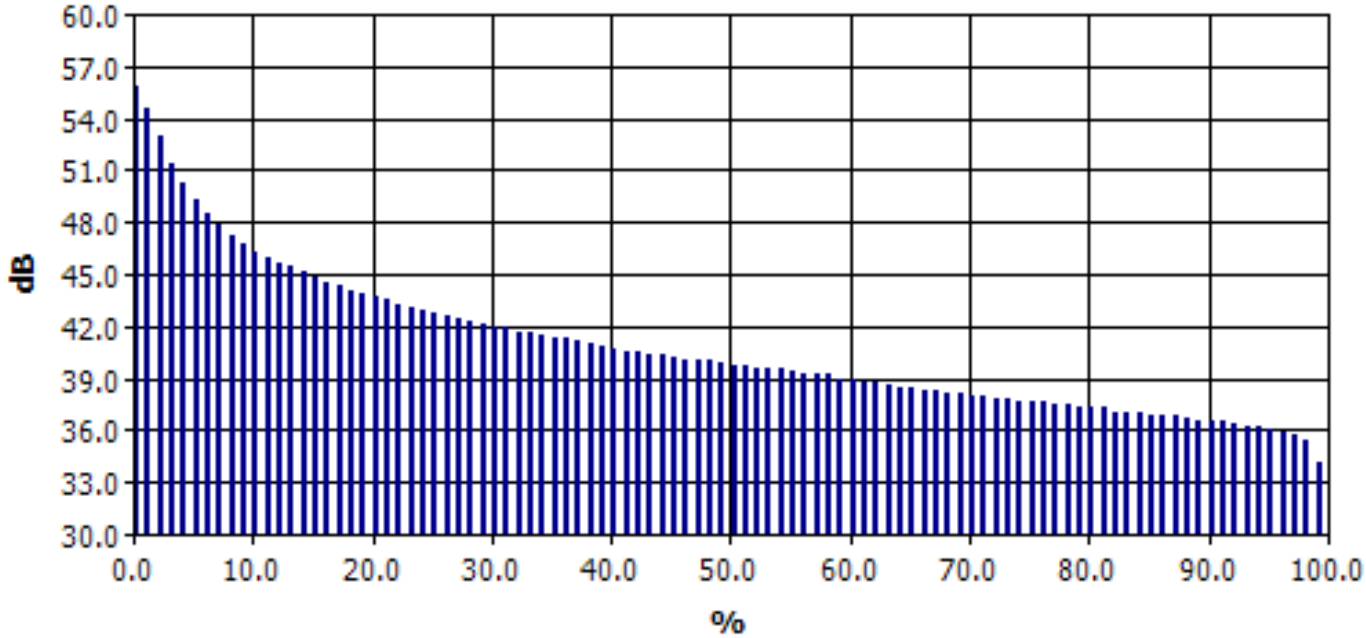
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
35.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.0	0.6	2.2
36.0	0.7	0.8	0.8	0.9	1.0	1.1	1.3	1.3	1.4	1.5	10.7
37.0	1.5	1.5	1.5	0.0	1.5	1.6	1.7	1.6	1.6	1.6	14.1
38.0	1.1	1.4	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	10.8
39.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.3	1.3	11.6
40.0	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1.0	1.0	1.0	10.9
41.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	7.4
42.0	0.7	0.7	0.6	0.6	0.6	0.7	0.6	0.7	0.6	0.6	6.6
43.0	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	5.5
44.0	0.5	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.2
45.0	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	3.5
46.0	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	2.8

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
47.0	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	1.7
48.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	1.4
49.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
50.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
51.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.6
52.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
53.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.6
54.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6
55.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.8
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		55.8	54.6	52.9	51.4	50.2	49.3	48.5	47.8	47.2
10%	46.7	46.3	46.0	45.7	45.4	45.1	44.8	44.6	44.3	44.1
20%	43.9	43.7	43.5	43.3	43.1	42.9	42.8	42.6	42.5	42.3
30%	42.1	42.0	41.9	41.7	41.6	41.5	41.4	41.3	41.1	41.0
40%	40.8	40.7	40.6	40.5	40.4	40.3	40.2	40.1	40.0	40.0
50%	39.9	39.8	39.7	39.6	39.6	39.5	39.4	39.3	39.2	39.2
60%	39.0	38.9	38.8	38.7	38.6	38.5	38.4	38.3	38.3	38.2
70%	38.1	38.0	37.9	37.8	37.8	37.7	37.6	37.6	37.5	37.5
80%	37.4	37.3	37.3	37.1	37.0	37.0	36.9	36.8	36.8	36.7
90%	36.6	36.6	36.5	36.4	36.3	36.2	36.1	35.9	35.8	35.5
100%	34.1									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/4/2020 4:01:00 PM	37.6	54.8	40.6	35.3	38.9	36.7
12/4/2020 4:02:00 PM	37.5	52.6	39.7	36.1	38.2	36.8
12/4/2020 4:03:00 PM	38.7	56.9	44.9	36.1	40.8	37.0
12/4/2020 4:04:00 PM	42.6	62.9	52.7	37.0	45.7	37.9
12/4/2020 4:05:00 PM	41.0	58.2	47.6	36.9	43.7	37.8
12/4/2020 4:06:00 PM	42.6	64.1	52.6	38.2	45.3	39.1
12/4/2020	41.4	58.4	46.5	38.6	44.2	39.4

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/4/2020 4:08:00 PM	42.0	61.3	48.6	37.5	44.6	38.4
12/4/2020 4:09:00 PM	44.0	60.7	47.0	39.5	45.9	41.2
12/4/2020 4:10:00 PM	40.7	59.7	47.3	38.5	41.3	39.6
12/4/2020 4:11:00 PM	45.8	71.8	60.0	38.2	47.4	39.1
12/4/2020 4:12:00 PM	45.4	73.9	61.6	36.9	44.3	38.5
12/4/2020 4:13:00 PM	40.5	61.6	48.1	36.4	43.0	38.0
12/4/2020 4:14:00 PM	40.1	67.8	47.7	35.9	42.9	37.0
12/4/2020 4:15:00 PM	39.8	61.4	49.1	36.2	42.1	37.2
12/4/2020 4:16:00 PM	41.0	59.5	46.4	36.5	43.9	37.7
12/4/2020 4:17:00 PM	37.9	65.8	43.0	35.4	39.7	36.6
12/4/2020 4:18:00 PM	37.7	60.6	43.5	35.5	39.0	36.3
12/4/2020 4:19:00 PM	37.8	57.1	40.5	35.1	39.6	36.1
12/4/2020 4:20:00 PM	37.1	56.6	42.9	35.2	37.7	36.2
12/4/2020 4:21:00 PM	36.6	63.1	42.7	35.2	37.5	36.0
12/4/2020 4:22:00 PM	38.5	56.7	46.2	35.7	41.3	36.5
12/4/2020 4:23:00 PM	38.7	61.8	47.9	36.1	41.0	36.8
12/4/2020 4:24:00 PM	47.1	70.8	57.8	37.0	50.9	38.4
12/4/2020 4:25:00 PM	43.9	73.9	55.6	36.4	47.0	37.8
12/4/2020 4:26:00 PM	37.9	59.2	43.3	36.2	38.9	37.0
12/4/2020 4:27:00 PM	39.6	58.7	43.3	36.4	40.8	37.8
12/4/2020 4:28:00 PM	40.3	57.6	42.9	38.9	41.5	39.6
12/4/2020 4:29:00 PM	40.3	61.7	50.4	38.2	40.8	39.3
12/4/2020 4:30:00 PM	44.6	84.4	66.6	37.8	44.2	38.8
12/4/2020 4:31:00 PM	42.6	65.5	52.7	35.4	45.7	37.3
12/4/2020 4:32:00 PM	41.8	65.7	53.0	35.1	45.8	36.3
12/4/2020 4:33:00 PM	53.9	78.1	68.9	35.4	58.8	36.8
12/4/2020 4:34:00 PM	53.8	76.3	66.7	34.4	59.4	36.9
12/4/2020 4:35:00 PM	40.9	62.8	50.9	34.5	44.6	35.8
12/4/2020 4:36:00 PM	44.8	67.8	54.1	34.8	48.7	37.2
12/4/2020 4:37:00 PM	43.6	67.4	53.0	34.9	47.9	36.4
12/4/2020 4:38:00 PM	44.5	68.2	58.6	35.5	47.4	37.9
12/4/2020 4:39:00 PM	51.0	72.9	63.6	38.0	55.9	39.9
12/4/2020 4:40:00 PM	45.2	63.0	50.5	39.0	48.3	40.6
12/4/2020 4:41:00 PM	48.8	64.5	52.6	44.0	50.8	45.7
12/4/2020 4:42:00 PM	45.1	67.0	53.8	40.2	47.1	42.4
12/4/2020 4:43:00 PM	40.8	61.6	47.2	37.7	42.9	38.8
12/4/2020 4:44:00 PM	38.1	59.2	47.0	35.7	39.0	37.1
12/4/2020 4:45:00 PM	37.2	74.5	52.2	34.2	37.8	35.7
12/4/2020	39.5	71.3	50.0	34.2	43.6	35.5

Logged Data Table (cont'd)

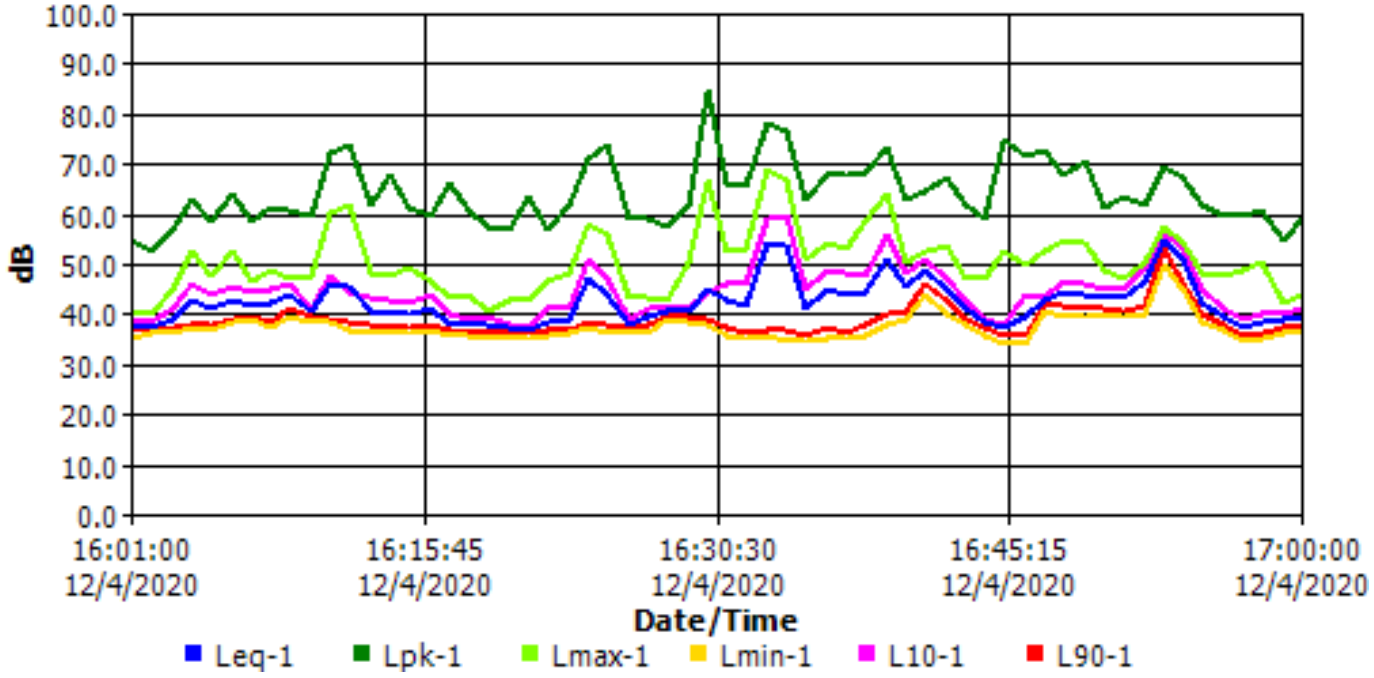
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/4/2020 4:47:00 PM	42.8	72.4	52.7	40.7	43.3	41.5
12/4/2020 4:48:00 PM	44.3	67.6	54.6	39.2	46.5	41.5
12/4/2020 4:49:00 PM	43.8	70.5	54.2	39.2	45.8	41.2
12/4/2020 4:50:00 PM	43.2	61.2	48.4	40.0	44.9	41.3
12/4/2020 4:51:00 PM	43.2	63.3	46.9	39.5	45.1	40.7
12/4/2020 4:52:00 PM	46.6	61.9	50.2	39.7	49.0	41.5
12/4/2020 4:53:00 PM	54.8	69.3	57.1	49.6	56.0	53.0
12/4/2020 4:54:00 PM	50.8	67.2	54.3	44.8	53.2	46.0
12/4/2020 4:55:00 PM	42.2	61.5	48.0	38.5	44.6	39.7
12/4/2020 4:56:00 PM	39.6	59.7	47.4	36.8	40.9	37.7
12/4/2020 4:57:00 PM	37.4	59.3	48.9	34.5	38.8	35.6
12/4/2020 4:58:00 PM	38.4	60.8	50.5	35.3	39.8	36.3
12/4/2020 4:59:00 PM	38.6	54.8	41.9	35.9	40.2	37.1
12/4/2020 5:00:00 PM	39.1	58.9	44.0	36.2	41.2	37.2

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	84.4 dB
Lmax	1	68.9 dB	Lmin	1	34.2 dB
Leq	1	45.1 dB	TWA	1	36.1 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

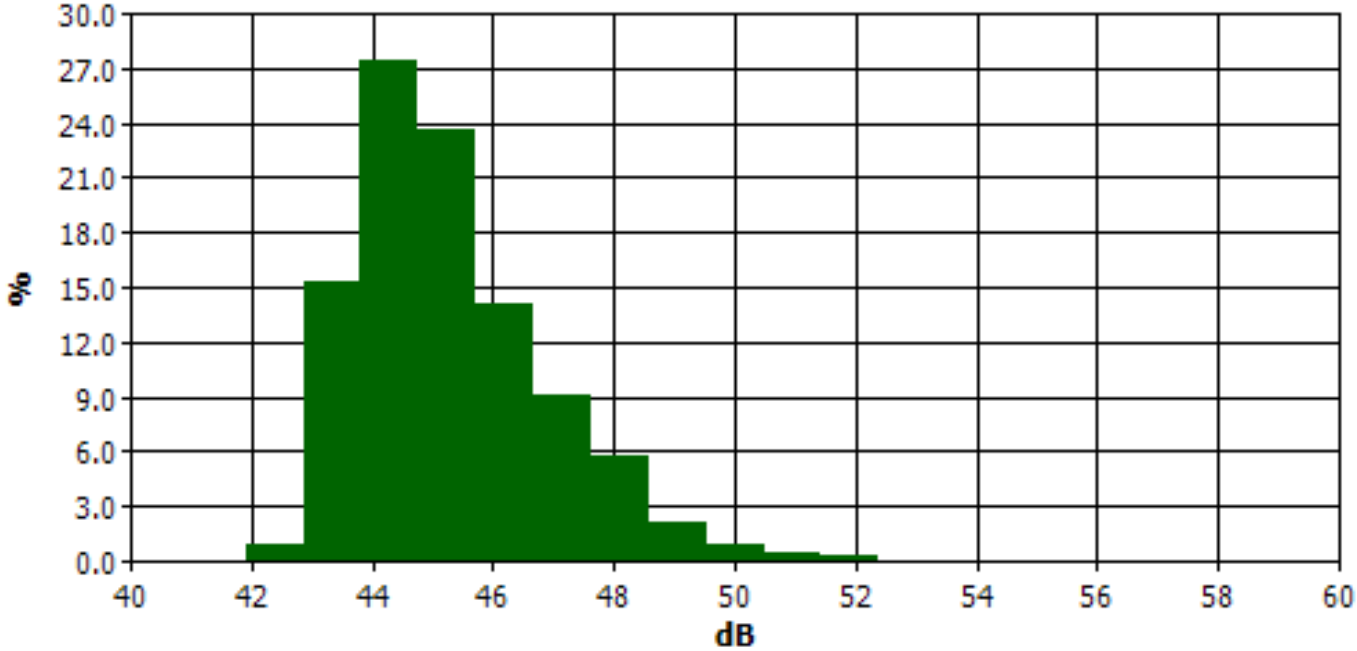
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK / EV103 - 792 / 2020
Location	N5 - Night time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Friday, December 04, 2020 21:00:00
Stop Time	Friday, December 04, 2020 22:00:00
User Name	JS
Comments	Vehicles movement ,domestic animals , insects,human activities .

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	45.8 dB	Dose	1	0 %
Lmin	1	42.1 dB	Lmax	1	54.7 dB
Lpk	1	76.2 dB	TWA	1	36.8 dB
L1	1	50.4 dB	L10	1	47.8 dB
L50	1	45.1 dB	L90	1	43.6 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



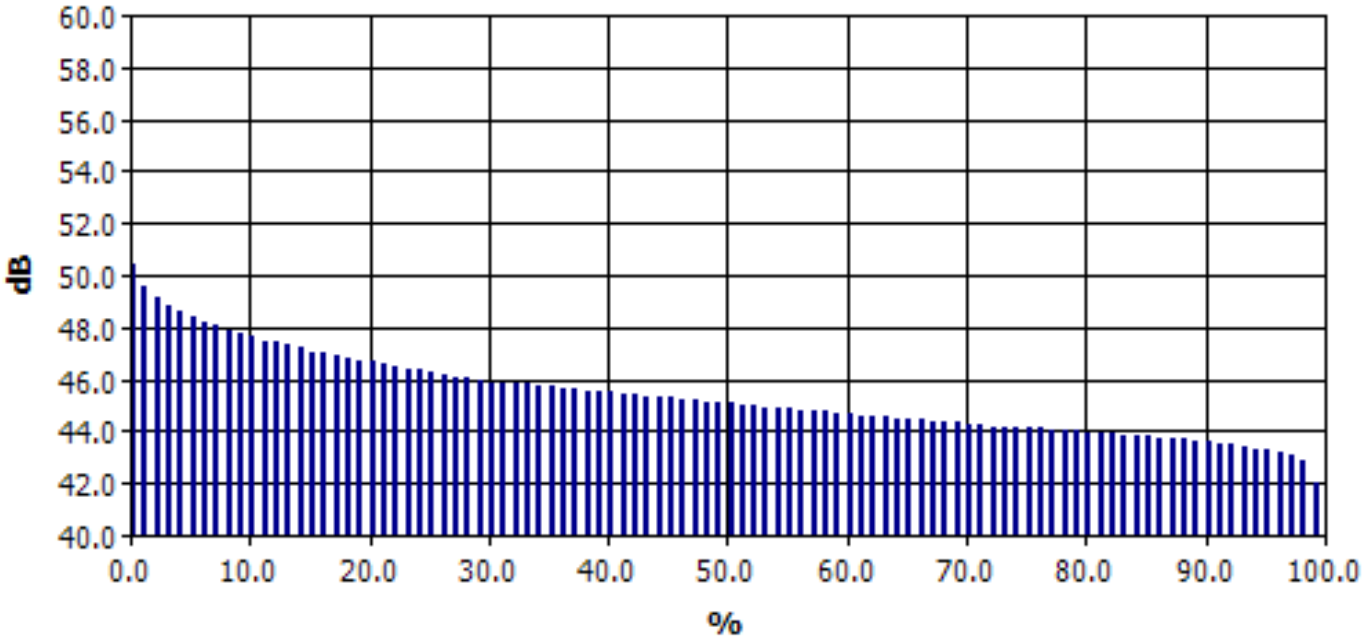
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.9
43.0	0.4	0.6	0.8	1.0	1.2	1.5	1.9	2.3	2.6	2.9	15.4
44.0	3.1	2.8	2.3	2.7	2.7	2.8	2.7	2.8	2.8	2.7	27.4
45.0	2.6	2.5	2.5	2.5	2.5	2.5	2.3	2.3	2.1	1.9	23.7
46.0	1.7	1.6	1.5	1.4	1.3	1.3	1.3	1.3	1.2	1.3	14.1
47.0	1.4	1.3	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	9.0
48.0	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.4	5.8
49.0	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	2.1
50.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
51.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		50.4	49.6	49.1	48.8	48.6	48.4	48.2	48.1	47.9
10%	47.8	47.7	47.5	47.4	47.3	47.2	47.0	47.0	46.9	46.8
20%	46.7	46.7	46.6	46.5	46.4	46.4	46.3	46.2	46.1	46.1
30%	46.0	45.9	45.9	45.8	45.8	45.7	45.7	45.6	45.6	45.5
40%	45.5	45.5	45.4	45.4	45.3	45.3	45.3	45.2	45.2	45.1
50%	45.1	45.1	45.0	45.0	44.9	44.9	44.9	44.8	44.8	44.8
60%	44.7	44.7	44.6	44.6	44.6	44.5	44.5	44.5	44.4	44.4
70%	44.4	44.3	44.3	44.2	44.2	44.2	44.1	44.1	44.0	44.0
80%	44.0	43.9	43.9	43.9	43.8	43.8	43.8	43.7	43.7	43.7
90%	43.6	43.6	43.5	43.5	43.4	43.3	43.3	43.2	43.1	42.9
100%	42.0									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/4/2020 9:01:00 PM	46.0	71.6	53.4	43.1	48.1	44.0
12/4/2020 9:02:00 PM	45.7	70.4	52.9	42.6	48.0	43.6
12/4/2020 9:03:00 PM	45.5	72.4	53.1	42.6	47.5	43.6
12/4/2020 9:04:00 PM	45.4	73.6	52.8	42.3	47.6	43.4
12/4/2020 9:05:00 PM	44.7	67.7	52.3	42.2	46.5	43.1
12/4/2020 9:06:00 PM	44.7	72.2	51.4	42.3	46.7	43.1
12/4/2020 9:07:00 PM	44.9	71.9	52.3	42.3	46.8	43.4
12/4/2020 9:08:00 PM	46.0	76.2	52.2	43.5	47.6	44.5
12/4/2020 9:09:00 PM	46.9	70.6	54.7	43.9	47.9	45.4
12/4/2020 9:10:00 PM	48.2	72.9	53.7	45.5	50.1	46.5
12/4/2020 9:11:00 PM	48.0	69.9	53.6	45.8	48.9	46.8
12/4/2020 9:12:00 PM	48.4	73.4	52.6	46.8	49.3	47.7
12/4/2020 9:13:00 PM	49.1	70.2	53.6	47.1	50.5	48.0
12/4/2020 9:14:00 PM	48.4	73.6	53.2	46.0	49.1	47.7
12/4/2020 9:15:00 PM	47.5	71.4	52.5	45.7	48.5	46.6
12/4/2020	47.4	70.3	52.7	45.8	48.4	46.7

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/4/2020 9:17:00 PM	47.3	72.2	52.6	46.2	48.2	46.8
12/4/2020 9:18:00 PM	46.8	68.8	52.8	45.2	47.9	45.9
12/4/2020 9:19:00 PM	46.2	70.6	51.4	44.5	47.1	45.4
12/4/2020 9:20:00 PM	45.9	69.8	51.2	43.6	46.9	44.8
12/4/2020 9:21:00 PM	46.4	68.5	52.5	44.1	48.2	45.1
12/4/2020 9:22:00 PM	47.4	68.0	52.1	44.3	49.8	45.3
12/4/2020 9:23:00 PM	45.2	66.8	51.8	43.6	46.2	44.4
12/4/2020 9:24:00 PM	44.5	68.6	51.8	42.7	46.0	43.4
12/4/2020 9:25:00 PM	44.6	68.7	53.1	42.6	45.8	43.4
12/4/2020 9:26:00 PM	44.5	66.4	50.4	42.7	45.7	43.5
12/4/2020 9:27:00 PM	45.1	69.2	51.7	43.3	46.3	44.0
12/4/2020 9:28:00 PM	45.5	70.0	52.3	43.2	46.5	44.0
12/4/2020 9:29:00 PM	45.7	68.4	53.8	43.5	46.7	44.4
12/4/2020 9:30:00 PM	46.1	73.1	51.6	43.8	47.2	45.0
12/4/2020 9:31:00 PM	46.1	68.0	52.3	43.7	47.0	45.1
12/4/2020 9:32:00 PM	46.5	71.7	52.0	43.7	47.2	45.5
12/4/2020 9:33:00 PM	46.5	68.5	53.5	44.8	47.1	45.6
12/4/2020 9:34:00 PM	45.5	70.0	51.9	43.5	46.7	44.4
12/4/2020 9:35:00 PM	45.4	67.9	50.9	43.5	46.3	44.2
12/4/2020 9:36:00 PM	46.1	73.1	52.6	43.5	47.6	44.6
12/4/2020 9:37:00 PM	45.0	73.2	51.0	43.1	46.1	43.9
12/4/2020 9:38:00 PM	44.7	72.4	51.7	42.9	45.7	43.7
12/4/2020 9:39:00 PM	44.6	67.9	51.4	43.1	45.4	43.8
12/4/2020 9:40:00 PM	44.8	70.1	50.6	43.1	45.9	44.0
12/4/2020 9:41:00 PM	45.3	67.5	52.7	43.2	46.7	44.2
12/4/2020 9:42:00 PM	45.1	70.3	53.6	43.2	46.1	44.0
12/4/2020 9:43:00 PM	44.9	71.6	50.9	43.3	45.9	44.0
12/4/2020 9:44:00 PM	44.9	70.3	52.6	43.0	45.9	44.0
12/4/2020 9:45:00 PM	45.6	68.3	52.5	43.9	46.4	44.6
12/4/2020 9:46:00 PM	45.6	68.6	52.2	43.5	46.6	44.7
12/4/2020 9:47:00 PM	45.4	72.9	49.6	43.7	46.2	44.3
12/4/2020 9:48:00 PM	45.4	70.2	51.4	43.5	46.3	44.4
12/4/2020 9:49:00 PM	45.5	69.4	53.4	43.2	46.4	44.5
12/4/2020 9:50:00 PM	45.6	69.5	53.4	44.3	46.4	44.9
12/4/2020 9:51:00 PM	44.7	69.3	52.3	42.4	46.1	43.3
12/4/2020 9:52:00 PM	44.4	73.0	52.8	42.4	45.8	43.2
12/4/2020 9:53:00 PM	44.2	70.5	53.0	42.1	45.3	43.0
12/4/2020 9:54:00 PM	44.6	73.4	53.2	43.0	45.7	43.6
12/4/2020	44.7	70.9	52.8	42.6	45.7	43.7

Logged Data Table (cont'd)

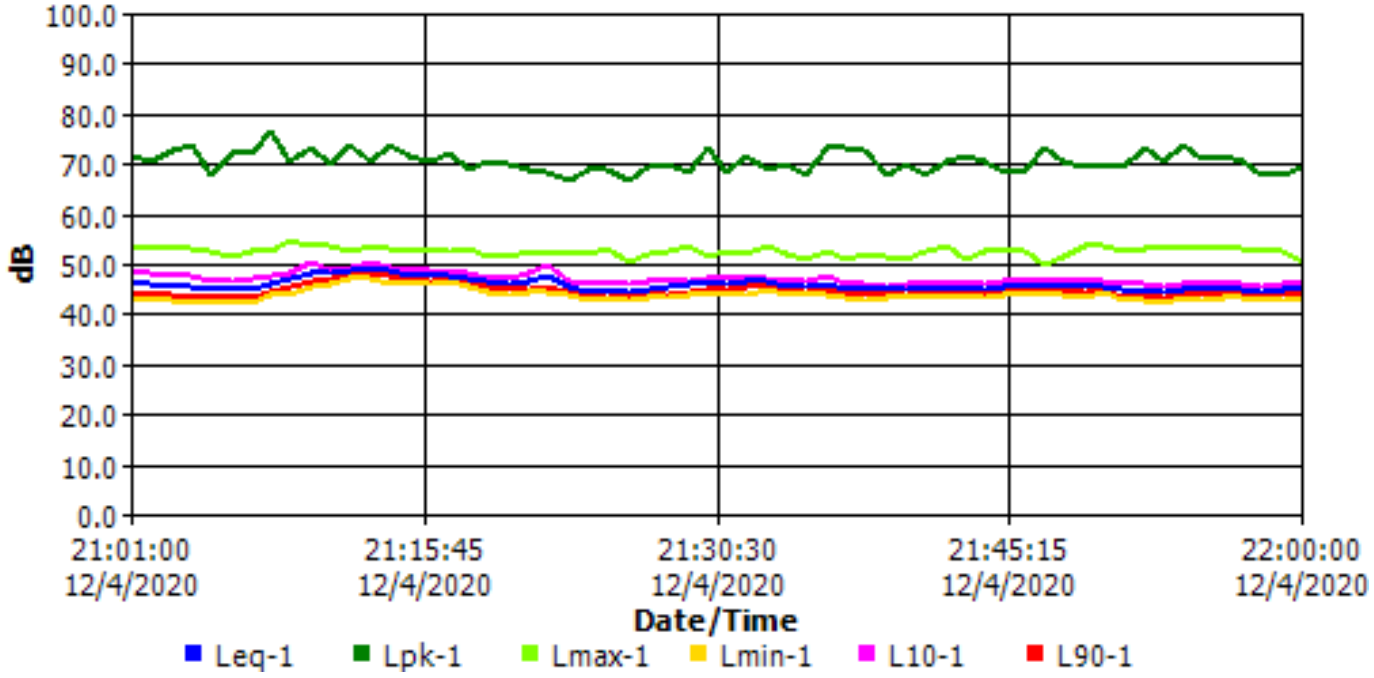
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/4/2020 9:56:00 PM	44.6	71.2	52.8	43.0	45.8	43.7
12/4/2020 9:57:00 PM	44.7	70.3	53.1	43.0	46.0	43.5
12/4/2020 9:58:00 PM	44.5	67.8	52.4	42.9	45.5	43.7
12/4/2020 9:59:00 PM	44.7	67.9	52.5	42.9	45.8	43.8
12/4/2020 10:00:00 PM	45.1	69.5	50.5	43.3	46.1	44.1

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	76.2 dB
Lmax	1	54.7 dB	Lmin	1	42.1 dB
Leq	1	45.8 dB	TWA	1	36.8 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

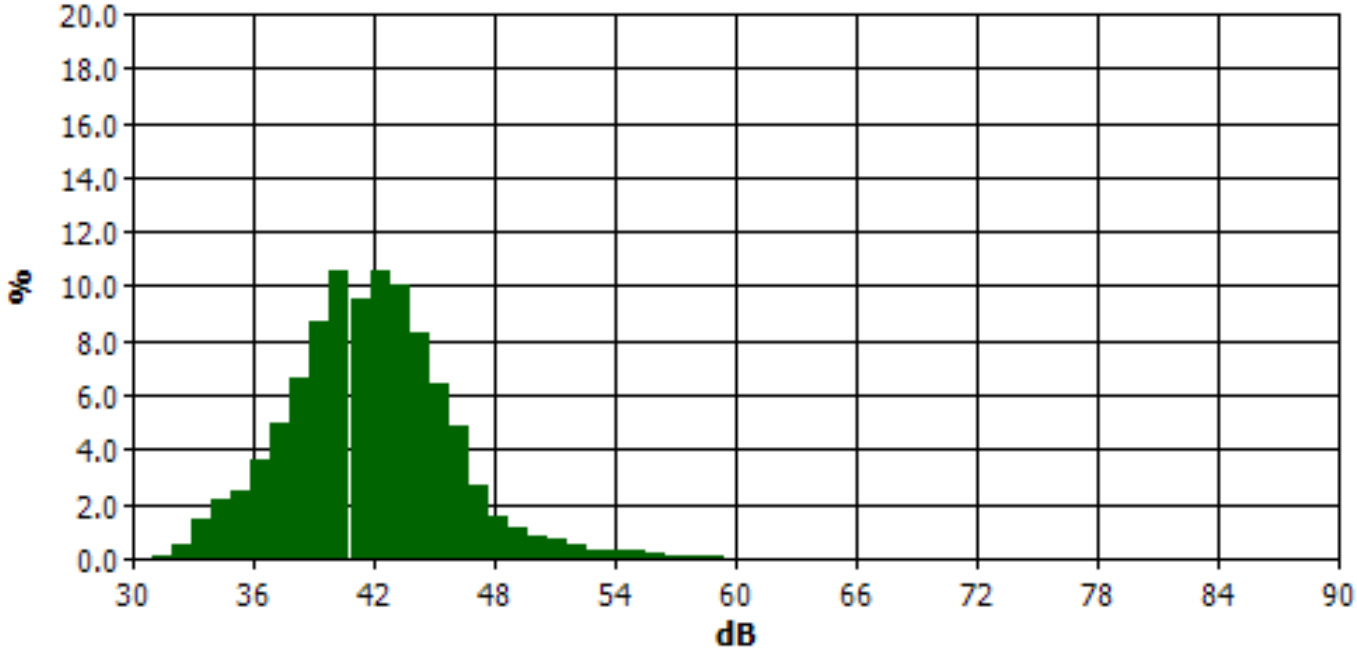
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK/EV103 - 792 / 2020
Location	N6 - Day time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Monday, December 07, 2020 14:00:00
Stop Time	Monday, December 07, 2020 15:00:00
User Name	JS
Comments	Human activities , domestic animals , boat movement , vehicles movement .

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	49.1 dB	Dose	1	0 %
Lmin	1	31.4 dB	Lmax	1	85.7 dB
Lpk	1	98.9 dB	TWA	1	40.1 dB
L1	1	54.7 dB	L10	1	46.6 dB
L50	1	41.8 dB	L90	1	36.8 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



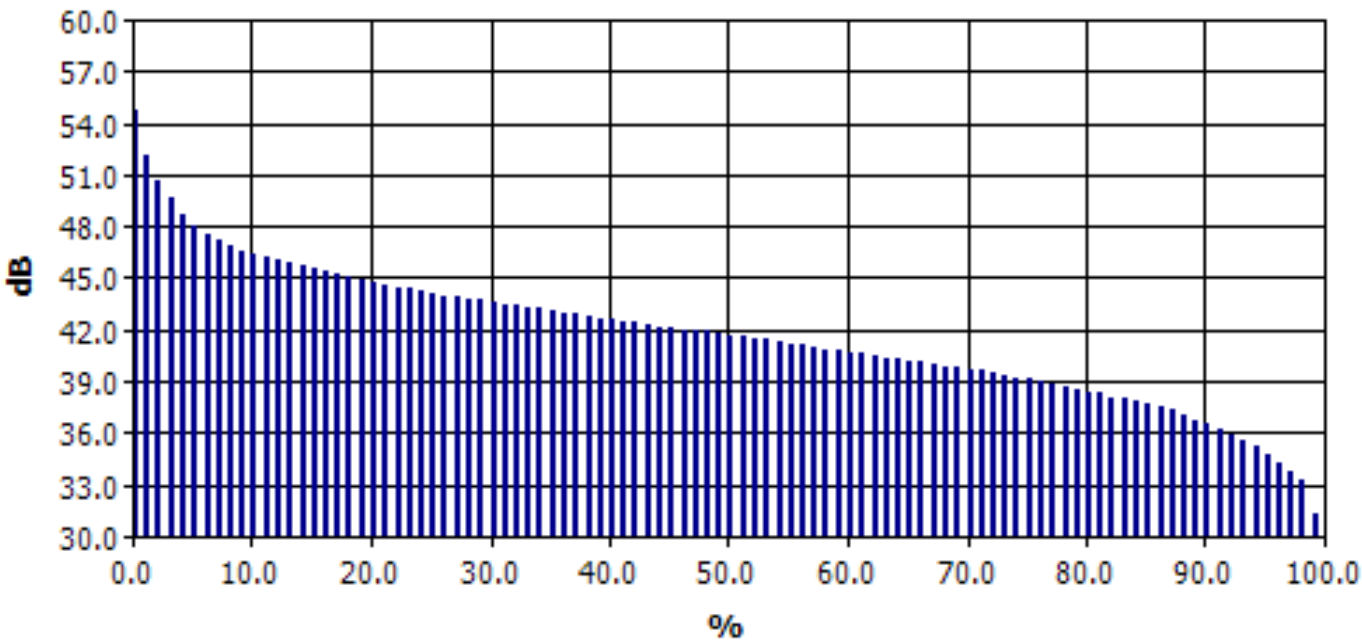
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
32.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.5
33.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.0	1.5
34.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.0	0.2	0.3	2.1
35.0	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.3	2.5
36.0	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	3.6
37.0	0.4	0.5	0.5	0.0	0.5	0.5	0.6	0.6	0.7	0.7	5.0
38.0	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	6.6
39.0	0.8	0.8	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.9	8.7
40.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	10.6
41.0	0.0	1.0	1.0	1.1	1.1	1.0	1.1	1.1	1.1	1.1	9.5
42.0	1.1	1.1	1.1	1.1	1.0	1.1	1.0	1.0	1.0	1.0	10.6
43.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	10.1
44.0	1.1	0.9	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.7	8.2
45.0	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	6.4
46.0	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	4.9
47.0	0.4	0.4	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	2.7
48.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	1.5

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
49.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
50.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
51.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
52.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.5
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
84.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
86.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		54.7	52.1	50.6	49.6	48.7	48.1	47.6	47.2	46.9
10%	46.6	46.4	46.2	46.0	45.9	45.7	45.5	45.4	45.2	45.0
20%	44.9	44.8	44.6	44.5	44.4	44.3	44.1	44.0	43.9	43.8
30%	43.7	43.6	43.5	43.4	43.3	43.2	43.1	43.0	42.9	42.8
40%	42.7	42.6	42.5	42.4	42.3	42.2	42.1	42.0	42.0	41.9
50%	41.8	41.7	41.6	41.5	41.4	41.3	41.2	41.1	41.0	40.8
60%	40.8	40.7	40.6	40.5	40.4	40.3	40.2	40.1	40.0	39.9
70%	39.8	39.7	39.6	39.5	39.4	39.2	39.1	39.0	38.9	38.7
80%	38.6	38.4	38.3	38.1	38.0	37.8	37.7	37.5	37.3	37.0
90%	36.8	36.5	36.2	35.9	35.5	35.2	34.8	34.3	33.7	33.2
100%	31.3									

Logged Data Table

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/7/2020 2:01:00 PM	42.4	59.9	47.5	36.2	45.1	39.3
12/7/2020 2:02:00 PM	43.3	64.2	46.4	39.0	44.8	41.2
12/7/2020 2:03:00 PM	50.8	78.4	60.0	36.5	56.0	40.5
12/7/2020 2:04:00 PM	45.6	82.0	65.5	32.3	45.5	34.7
12/7/2020 2:05:00 PM	40.4	57.6	44.7	32.7	42.5	36.7
12/7/2020 2:06:00 PM	40.5	57.0	46.7	34.8	42.8	37.5
12/7/2020 2:07:00 PM	40.4	58.4	47.6	35.0	42.7	37.6
12/7/2020 2:08:00 PM	41.2	59.0	46.9	33.8	43.4	38.2
12/7/2020 2:09:00 PM	42.1	58.6	47.5	36.1	43.9	39.2
12/7/2020 2:10:00 PM	43.7	69.3	53.8	38.2	46.5	39.8
12/7/2020 2:11:00 PM	39.8	67.4	54.8	31.5	43.1	33.9
12/7/2020 2:12:00 PM	44.7	77.0	63.3	34.0	42.1	36.8
12/7/2020 2:13:00 PM	44.0	71.9	58.3	33.3	45.8	37.8
12/7/2020 2:14:00 PM	45.3	70.6	57.2	34.2	48.9	38.6
12/7/2020 2:15:00 PM	43.2	66.2	56.1	34.4	45.6	37.8
12/7/2020 2:16:00 PM	42.1	65.6	51.0	35.6	44.2	38.7
12/7/2020 2:17:00 PM	48.6	72.8	60.2	34.8	53.0	38.3
12/7/2020 2:18:00 PM	50.0	71.9	58.9	39.1	53.8	42.5
12/7/2020 2:19:00 PM	45.7	71.5	59.0	35.9	48.9	38.4
12/7/2020 2:20:00 PM	43.6	72.1	60.9	35.2	44.6	38.3
12/7/2020 2:21:00 PM	42.3	68.2	57.5	32.4	43.5	34.2
12/7/2020 2:22:00 PM	39.1	69.1	52.2	32.9	40.9	34.4
12/7/2020 2:23:00 PM	43.9	82.7	65.1	33.0	44.6	34.7
12/7/2020 2:24:00 PM	43.3	74.7	59.8	31.4	46.4	34.3
12/7/2020 2:25:00 PM	42.7	68.6	52.8	32.9	46.9	35.2
12/7/2020 2:26:00 PM	46.0	77.8	63.6	33.5	49.3	35.7
12/7/2020 2:27:00 PM	46.3	73.1	61.3	36.7	49.0	39.0
12/7/2020 2:28:00 PM	45.6	71.1	57.6	36.7	48.7	40.0
12/7/2020 2:29:00 PM	44.6	75.1	59.9	36.8	47.1	38.7
12/7/2020 2:30:00 PM	46.0	68.7	59.2	36.9	48.7	40.1
12/7/2020 2:31:00 PM	43.7	65.5	52.1	36.0	46.3	37.9
12/7/2020 2:32:00 PM	43.1	67.8	55.9	37.5	45.4	39.7
12/7/2020 2:33:00 PM	44.2	74.0	61.2	37.0	45.7	39.6
12/7/2020 2:34:00 PM	41.9	65.9	51.4	36.9	44.0	38.6
12/7/2020 2:35:00 PM	43.6	59.9	47.7	36.0	46.3	38.9
12/7/2020 2:36:00 PM	43.1	60.9	48.7	34.8	46.0	37.6
12/7/2020 2:37:00 PM	43.5	59.6	48.3	36.6	46.2	39.7
12/7/2020 2:38:00 PM	42.1	64.5	53.6	35.1	43.9	38.3
12/7/2020	42.8	62.7	54.1	34.6	44.9	37.6

Logged Data Table (cont'd)

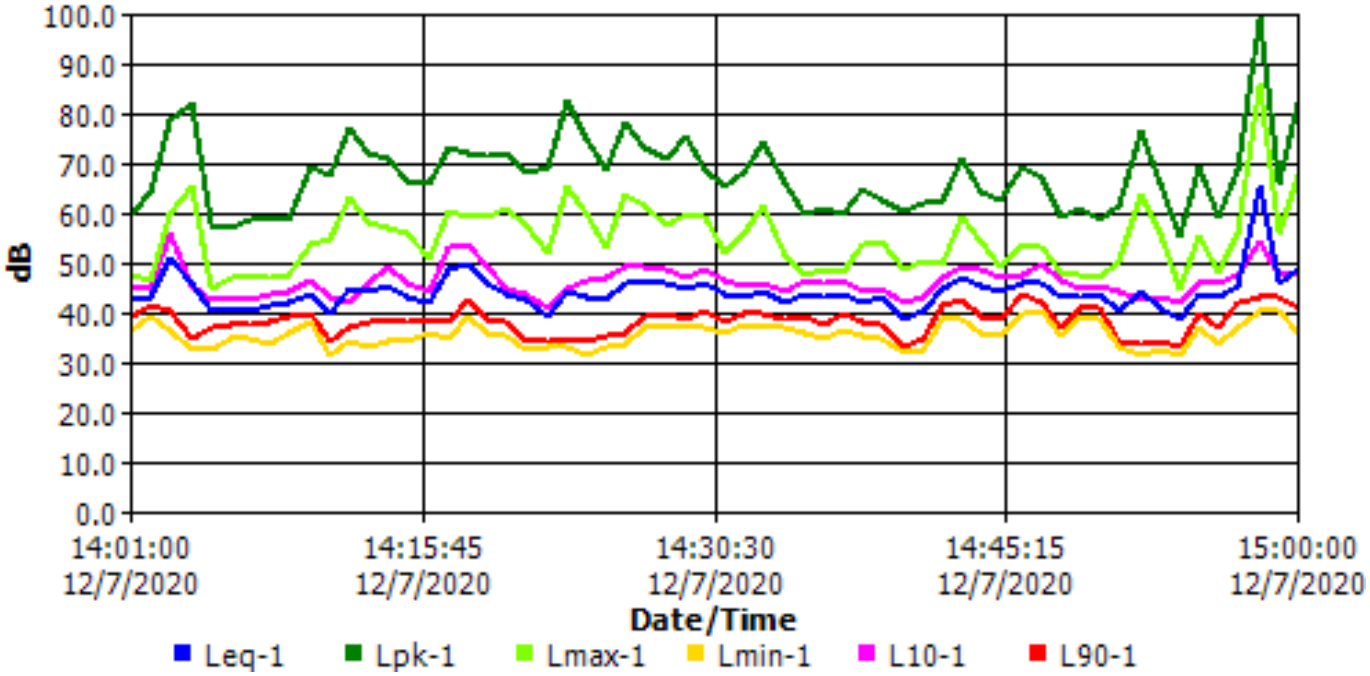
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/7/2020 2:40:00 PM	38.8	60.4	48.4	31.8	41.7	33.0
12/7/2020 2:41:00 PM	40.5	62.2	50.4	32.4	43.2	34.6
12/7/2020 2:42:00 PM	44.6	62.4	49.8	38.7	47.2	41.3
12/7/2020 2:43:00 PM	46.9	70.6	59.4	38.6	49.2	42.3
12/7/2020 2:44:00 PM	45.2	64.3	53.9	35.9	48.6	39.0
12/7/2020 2:45:00 PM	44.3	62.3	48.9	35.4	47.1	38.8
12/7/2020 2:46:00 PM	45.8	69.2	53.7	39.5	47.5	43.7
12/7/2020 2:47:00 PM	46.1	67.2	53.3	40.1	49.6	41.8
12/7/2020 2:48:00 PM	43.2	58.9	48.0	35.1	46.2	37.1
12/7/2020 2:49:00 PM	43.1	60.6	47.5	39.2	44.8	40.8
12/7/2020 2:50:00 PM	43.4	58.7	47.1	38.5	45.2	40.9
12/7/2020 2:51:00 PM	40.5	61.5	50.1	32.9	44.4	34.3
12/7/2020 2:52:00 PM	44.4	76.5	63.6	31.4	42.3	33.8
12/7/2020 2:53:00 PM	40.9	65.9	55.8	32.5	43.1	34.4
12/7/2020 2:54:00 PM	38.6	55.1	44.8	31.5	41.8	33.0
12/7/2020 2:55:00 PM	43.4	69.3	55.1	36.7	45.6	39.9
12/7/2020 2:56:00 PM	42.8	58.9	48.2	33.4	45.9	36.8
12/7/2020 2:57:00 PM	45.4	68.7	56.0	37.1	47.5	42.1
12/7/2020 2:58:00 PM	65.2	98.9	85.7	40.1	54.0	43.2
12/7/2020 2:59:00 PM	45.8	66.0	55.7	40.1	47.6	43.2
12/7/2020 3:00:00 PM	48.8	82.6	67.7	35.9	47.9	40.9

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	98.9 dB
Lmax	1	85.7 dB	Lmin	1	31.4 dB
Leq	1	49.1 dB	TWA	1	40.1 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

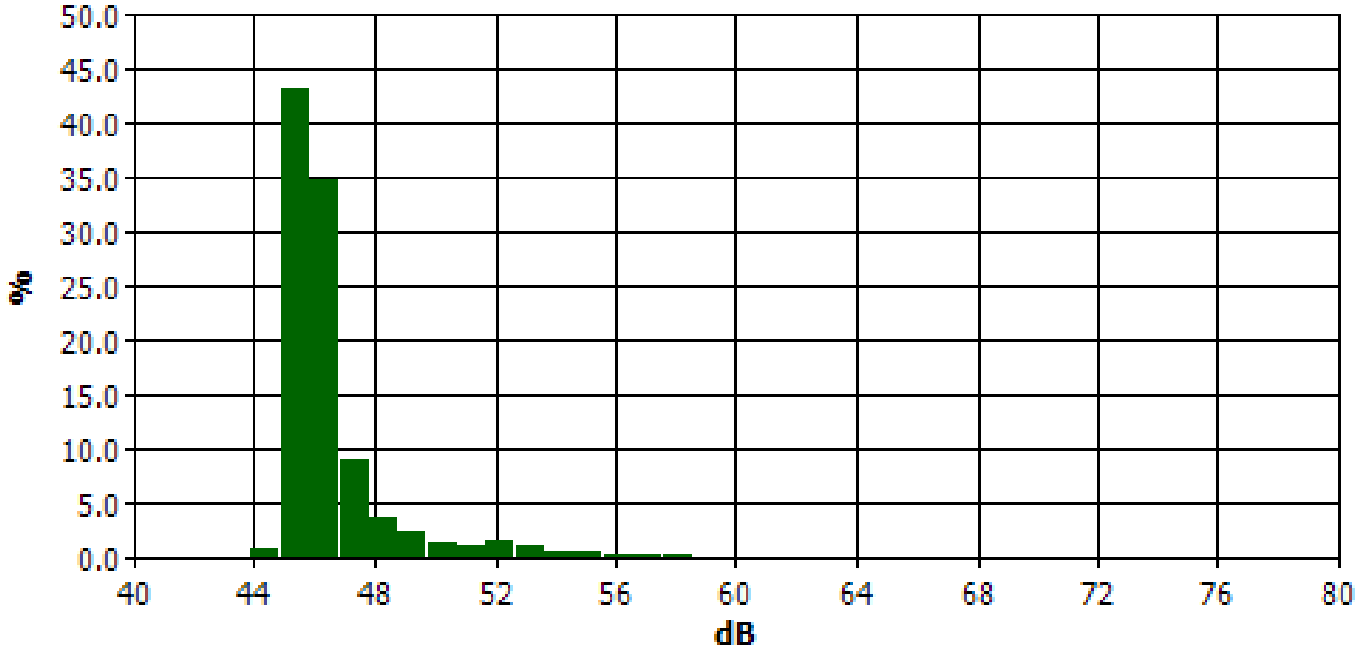
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK/ EV103 - 792 /2020
Location	N6 - Night time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Monday, December 07, 2020 21:00:15
Stop Time	Monday, December 07, 2020 22:00:15
User Name	JS
Comments	Human activities ,domestic aniamals , insects .

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	47.8 dB	Dose	1	0 %
Lmin	1	44.3 dB	Lmax	1	70.4 dB
Lpk	1	85.8 dB	TWA	1	38.8 dB
L1	1	55.6 dB	L10	1	48.5 dB
L50	1	46 dB	L90	1	45.3 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



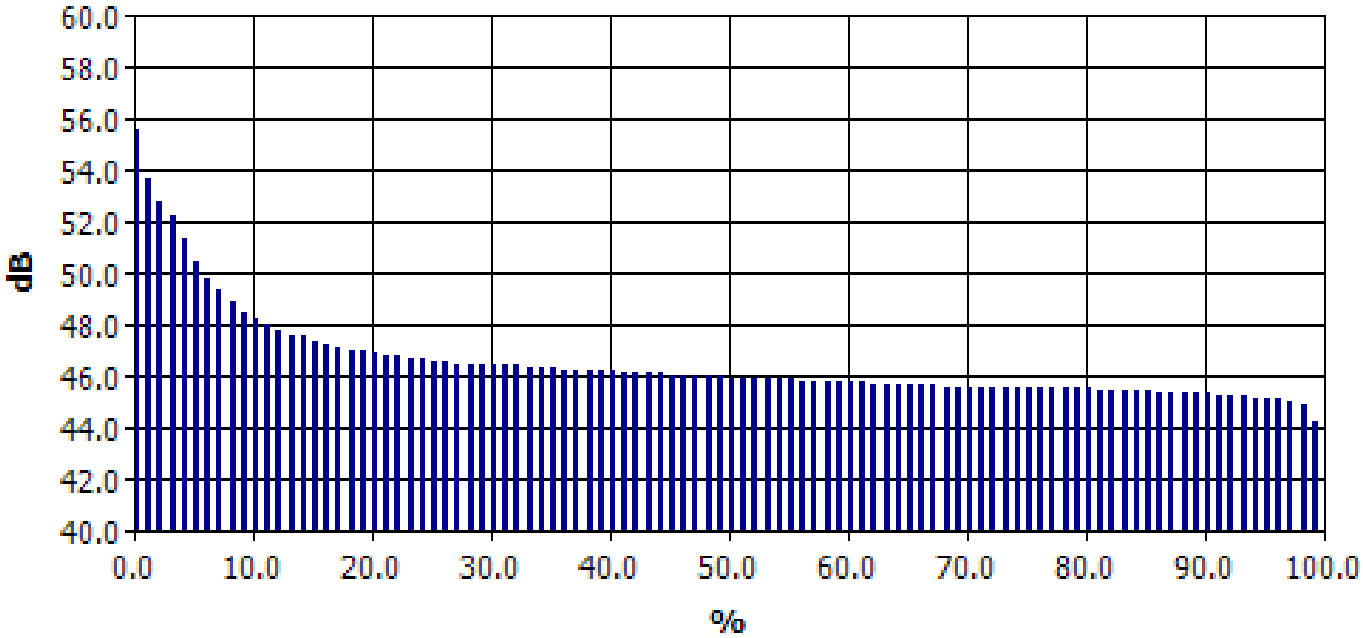
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.7
45.0	0.8	1.5	2.3	3.4	4.5	5.6	6.2	6.6	6.3	6.0	43.1
46.0	5.7	5.1	4.5	4.0	3.5	3.1	2.6	2.3	2.0	1.8	34.7
47.0	1.5	1.4	0.8	1.0	0.9	0.8	0.7	0.6	0.6	0.5	8.9
48.0	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	3.6
49.0	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.3
50.0	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	1.4
51.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
52.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	1.5
53.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1
54.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.5
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		55.6	53.7	52.8	52.2	51.3	50.4	49.8	49.3	48.9
10%	48.5	48.2	48.0	47.8	47.6	47.5	47.3	47.2	47.1	47.0
20%	47.0	46.9	46.8	46.8	46.7	46.7	46.6	46.6	46.5	46.5
30%	46.5	46.4	46.4	46.4	46.3	46.3	46.3	46.2	46.2	46.2
40%	46.2	46.2	46.1	46.1	46.1	46.1	46.0	46.0	46.0	46.0
50%	46.0	45.9	45.9	45.9	45.9	45.9	45.9	45.8	45.8	45.8
60%	45.8	45.8	45.8	45.7	45.7	45.7	45.7	45.7	45.7	45.6
70%	45.6	45.6	45.6	45.6	45.6	45.6	45.5	45.5	45.5	45.5
80%	45.5	45.5	45.4	45.4	45.4	45.4	45.4	45.3	45.3	45.3
90%	45.3	45.3	45.2	45.2	45.2	45.1	45.1	45.1	45.0	44.9
100%	44.2									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/7/2020 9:01:15 PM	46.9	73.9	56.3	45.0	47.9	45.8
12/7/2020 9:02:15 PM	47.4	68.1	54.6	44.8	48.9	45.8
12/7/2020 9:03:15 PM	46.9	64.4	50.6	45.0	48.7	45.8
12/7/2020 9:04:15 PM	45.9	63.3	49.3	44.9	46.6	45.5
12/7/2020 9:05:15 PM	47.0	66.5	57.2	44.9	48.4	45.6
12/7/2020 9:06:15 PM	46.6	66.5	53.9	44.9	47.1	45.6
12/7/2020 9:07:15 PM	46.1	65.1	53.8	45.1	46.4	45.6
12/7/2020	47.4	67.4	55.1	45.0	49.4	45.9

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/7/2020 9:09:15 PM	46.3	62.4	49.9	45.0	47.1	45.7
12/7/2020 9:10:15 PM	46.3	66.6	52.4	45.2	47.0	45.8
12/7/2020 9:11:15 PM	49.2	85.8	69.2	45.0	50.0	45.8
12/7/2020 9:12:15 PM	49.9	77.5	69.5	45.8	49.6	46.5
12/7/2020 9:13:15 PM	49.4	77.9	69.8	45.0	47.5	46.0
12/7/2020 9:14:15 PM	46.4	71.5	56.5	45.1	47.0	45.8
12/7/2020 9:15:15 PM	51.0	78.5	70.4	45.0	46.6	45.6
12/7/2020 9:16:15 PM	50.6	72.7	59.7	45.0	54.8	45.8
12/7/2020 9:17:15 PM	46.2	65.6	53.4	44.8	46.8	45.4
12/7/2020 9:18:15 PM	48.6	74.8	64.7	44.9	48.2	45.6
12/7/2020 9:19:15 PM	47.7	74.1	63.2	44.8	46.7	45.5
12/7/2020 9:20:15 PM	46.2	67.7	52.7	44.6	47.3	45.4
12/7/2020 9:21:15 PM	45.8	63.5	50.0	44.5	46.5	45.3
12/7/2020 9:22:15 PM	45.4	59.4	46.9	44.3	45.9	45.1
12/7/2020 9:23:15 PM	45.5	62.1	48.5	44.5	45.9	45.2
12/7/2020 9:24:15 PM	45.8	64.0	50.3	44.6	46.4	45.3
12/7/2020 9:25:15 PM	46.9	76.1	61.2	44.6	47.0	45.3
12/7/2020 9:26:15 PM	46.9	76.3	61.4	44.5	47.1	45.4
12/7/2020 9:27:15 PM	46.9	74.9	61.2	44.9	47.5	45.7
12/7/2020 9:28:15 PM	46.1	68.9	54.3	44.7	46.5	45.5
12/7/2020 9:29:15 PM	45.6	59.6	46.8	44.8	46.1	45.4
12/7/2020 9:30:15 PM	45.7	59.0	46.6	44.8	46.1	45.5
12/7/2020 9:31:15 PM	51.1	75.0	60.6	44.5	53.9	45.4
12/7/2020 9:32:15 PM	52.2	83.5	64.9	44.9	53.8	46.6
12/7/2020 9:33:15 PM	47.7	71.8	57.8	45.1	49.6	45.9
12/7/2020 9:34:15 PM	47.2	68.0	55.5	45.2	48.9	45.8
12/7/2020 9:35:15 PM	48.7	73.3	62.8	45.2	50.4	45.9
12/7/2020 9:36:15 PM	46.8	67.9	54.5	45.2	48.1	45.8
12/7/2020 9:37:15 PM	47.3	70.4	57.1	44.9	48.8	45.8
12/7/2020 9:38:15 PM	46.9	68.4	56.1	45.6	47.6	46.3
12/7/2020 9:39:15 PM	47.9	71.5	58.0	45.2	49.5	46.1
12/7/2020 9:40:15 PM	49.9	71.6	61.6	45.4	53.0	46.1
12/7/2020 9:41:15 PM	47.2	67.6	54.9	45.3	48.5	46.1
12/7/2020 9:42:15 PM	52.3	79.2	63.4	45.2	55.8	46.8
12/7/2020 9:43:15 PM	51.9	84.5	66.7	45.1	55.1	46.4
12/7/2020 9:44:15 PM	48.7	84.7	66.4	45.3	50.4	46.1
12/7/2020 9:45:15 PM	47.9	72.0	56.2	44.9	49.2	46.2
12/7/2020 9:46:15 PM	50.1	68.3	59.5	45.2	54.5	46.0
12/7/2020	45.6	63.7	49.7	44.5	46.3	45.1

Logged Data Table (cont'd)

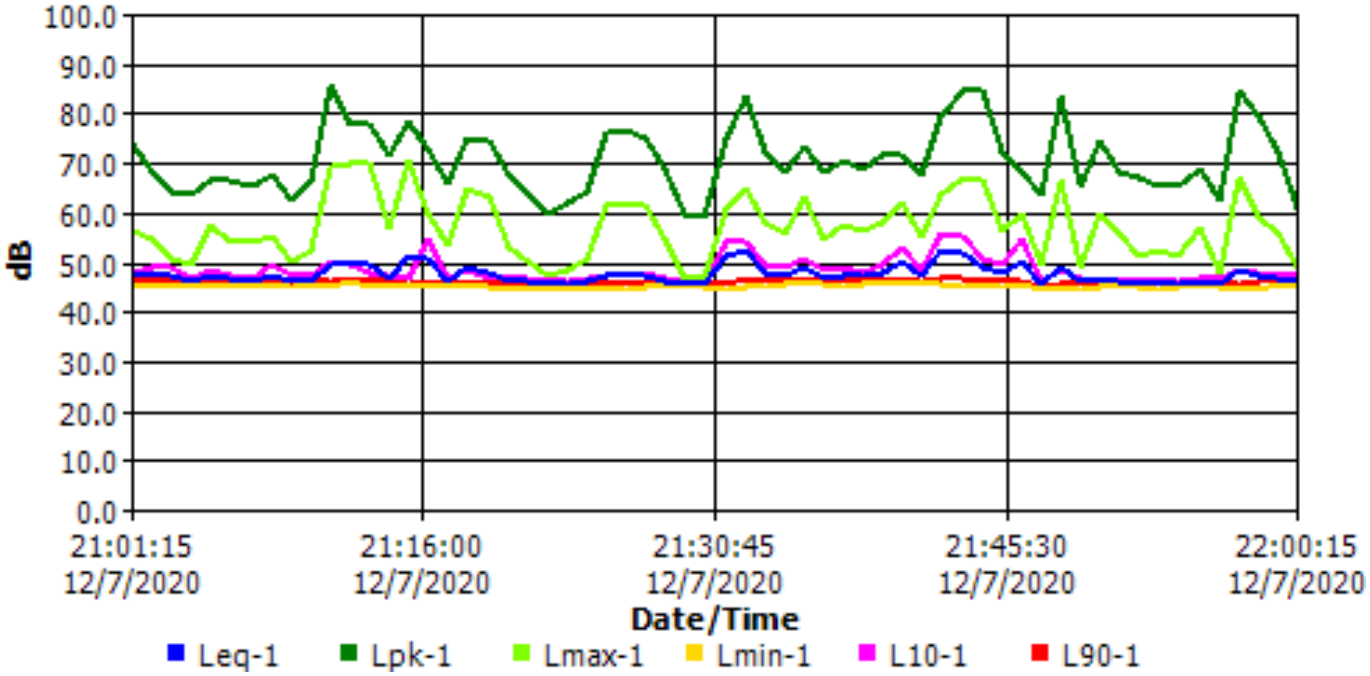
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/7/2020 9:48:15 PM	48.7	83.3	66.2	44.5	48.4	45.2
12/7/2020 9:49:15 PM	45.8	65.1	48.8	44.5	46.5	45.3
12/7/2020 9:50:15 PM	45.9	74.1	59.7	44.7	46.0	45.4
12/7/2020 9:51:15 PM	45.8	68.3	55.4	44.8	46.2	45.3
12/7/2020 9:52:15 PM	45.6	66.7	51.2	44.7	46.0	45.2
12/7/2020 9:53:15 PM	45.6	65.1	52.2	44.6	46.0	45.3
12/7/2020 9:54:15 PM	45.7	65.5	51.1	44.7	46.2	45.5
12/7/2020 9:55:15 PM	46.1	68.9	56.8	45.0	46.7	45.5
12/7/2020 9:56:15 PM	45.7	62.6	47.8	44.8	46.4	45.3
12/7/2020 9:57:15 PM	48.4	84.2	67.2	44.6	48.3	45.5
12/7/2020 9:58:15 PM	46.9	79.5	59.1	44.6	47.5	45.9
12/7/2020 9:59:15 PM	46.6	72.2	55.9	45.3	47.3	46.0
12/7/2020 10:00:15 PM	46.3	60.5	48.7	45.1	47.0	45.8

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	85.8 dB
Lmax	1	70.4 dB	Lmin	1	44.3 dB
Leq	1	47.8 dB	TWA	1	38.8 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

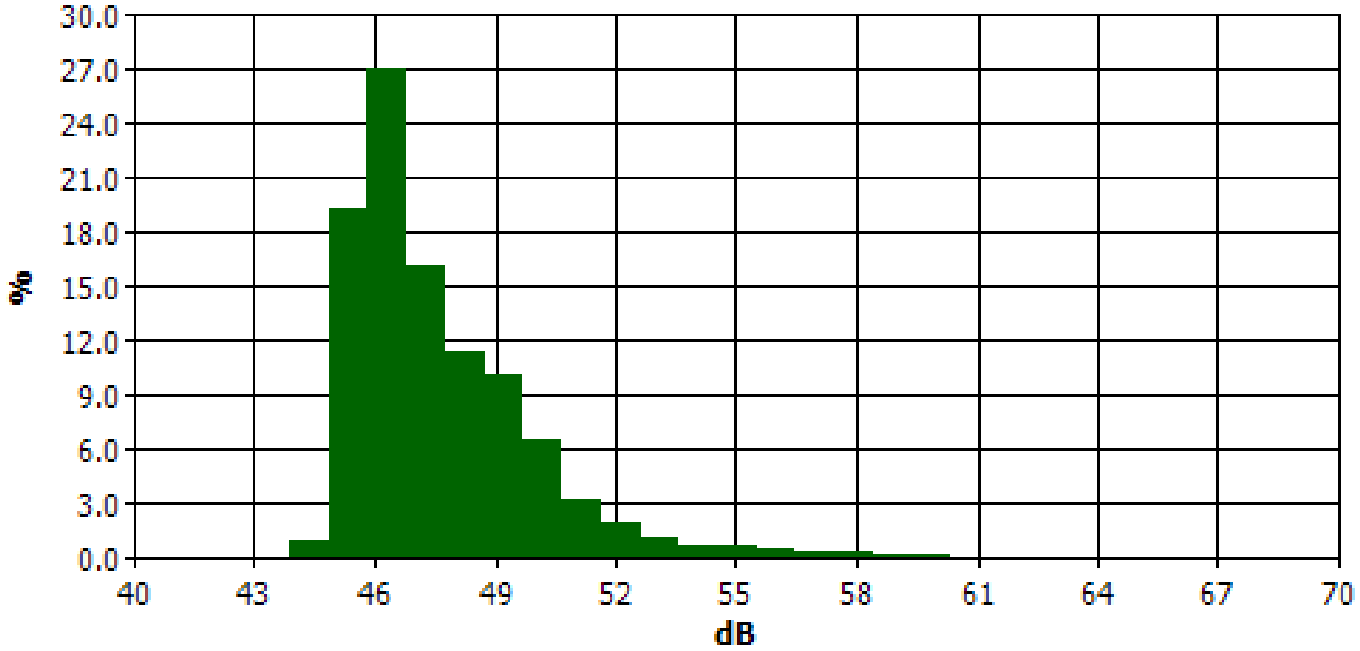
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK / EV103 - 792 /2020
Location	N7 - Day time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Tuesday, December 08, 2020 14:15:32
Stop Time	Tuesday, December 08, 2020 15:15:32
User Name	JS
Comments	Human activities , domestic animals , Vehicles movement , boat movement.

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	48.8 dB	Dose	1	0 %
Lmin	1	44.3 dB	Lmax	1	69.7 dB
Lpk	1	88.2 dB	TWA	1	39.8 dB
L1	1	56.8 dB	L10	1	50.6 dB
L50	1	47 dB	L90	1	45.4 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



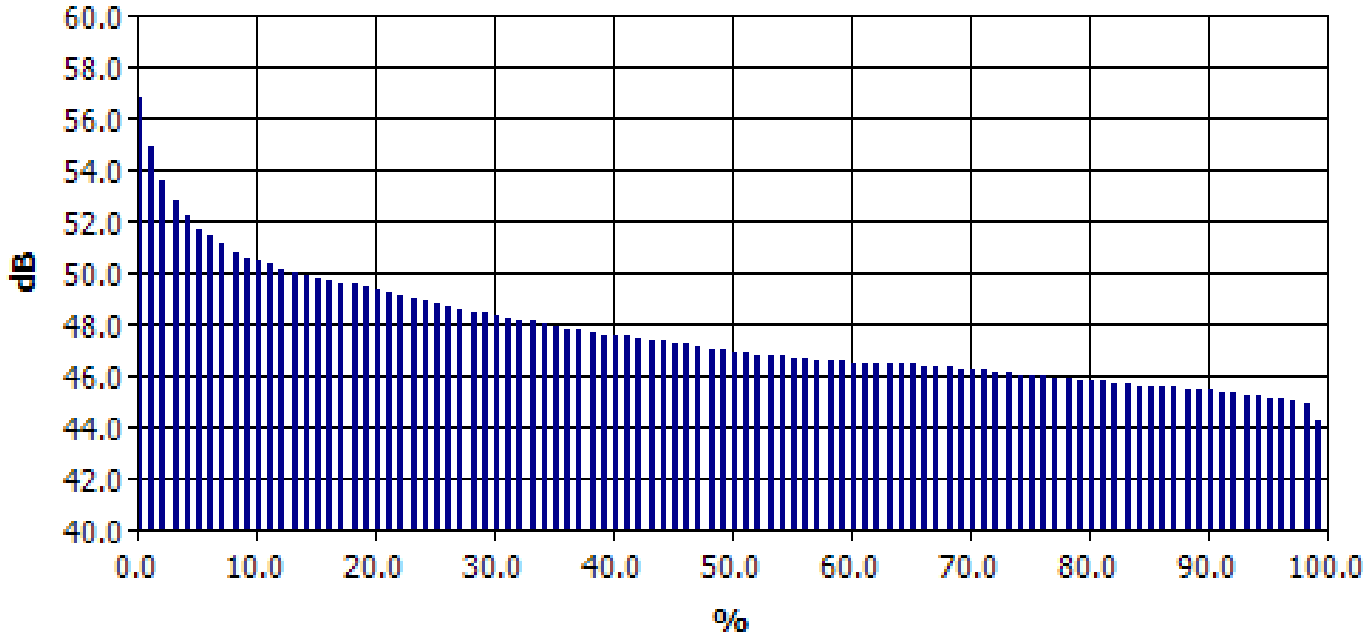
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.9
45.0	0.8	1.2	1.7	2.0	2.2	2.3	2.2	2.2	2.3	2.3	19.2
46.0	2.4	2.5	2.6	2.9	3.0	3.0	3.0	2.8	2.5	2.4	27.0
47.0	2.3	2.2	1.3	1.7	1.7	1.5	1.5	1.3	1.4	1.3	16.1
48.0	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.1	11.4
49.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	10.0
50.0	0.9	0.9	0.5	0.7	0.6	0.6	0.6	0.5	0.5	0.5	6.4
51.0	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	3.1
52.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	1.8
53.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
54.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
55.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6
56.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		56.8	54.9	53.5	52.8	52.2	51.7	51.4	51.1	50.8
10%	50.6	50.4	50.3	50.1	50.0	49.9	49.8	49.7	49.6	49.5
20%	49.4	49.3	49.2	49.1	49.0	48.9	48.8	48.7	48.6	48.5
30%	48.4	48.3	48.2	48.1	48.1	48.0	47.9	47.8	47.8	47.7
40%	47.6	47.5	47.5	47.4	47.3	47.3	47.2	47.2	47.1	47.0
50%	47.0	46.9	46.9	46.8	46.8	46.8	46.7	46.7	46.6	46.6
60%	46.6	46.5	46.5	46.5	46.4	46.4	46.4	46.3	46.3	46.3
70%	46.2	46.2	46.2	46.1	46.1	46.0	46.0	46.0	45.9	45.9
80%	45.8	45.8	45.8	45.7	45.7	45.6	45.6	45.5	45.5	45.4
90%	45.4	45.4	45.3	45.3	45.2	45.2	45.1	45.1	45.0	44.9
100%	44.2									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/8/2020 2:16:32 PM	50.8	82.2	64.8	44.9	54.0	46.0
12/8/2020 2:17:32 PM	47.9	69.1	57.5	44.4	50.9	45.2
12/8/2020 2:18:32 PM	46.7	66.7	51.9	44.5	49.0	45.1
12/8/2020 2:19:32 PM	46.7	68.9	54.8	44.3	48.4	45.1
12/8/2020 2:20:32 PM	47.3	73.6	62.3	44.5	48.6	45.2
12/8/2020 2:21:32 PM	46.8	69.6	57.3	44.5	48.2	45.4
12/8/2020 2:22:32 PM	47.2	81.6	55.8	45.0	48.9	45.7
12/8/2020 2:23:32 PM	46.9	68.2	55.8	44.9	48.3	45.5
12/8/2020 2:24:32 PM	47.6	65.8	54.4	45.1	50.5	45.8
12/8/2020 2:25:32 PM	49.3	65.9	55.7	46.4	50.5	47.8
12/8/2020 2:26:32 PM	50.4	76.4	59.0	45.9	52.5	47.4
12/8/2020	51.2	76.9	60.5	47.5	53.5	48.8

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/8/2020 2:28:32 PM	49.4	73.2	54.6	46.9	50.5	48.2
12/8/2020 2:29:32 PM	51.1	79.5	61.2	47.8	52.6	48.9
12/8/2020 2:30:32 PM	50.5	78.2	59.0	47.4	51.9	48.8
12/8/2020 2:31:32 PM	49.4	67.1	52.8	46.5	50.8	47.4
12/8/2020 2:32:32 PM	50.5	87.0	62.7	46.7	52.1	47.8
12/8/2020 2:33:32 PM	50.4	78.7	61.4	47.0	52.1	48.0
12/8/2020 2:34:32 PM	48.9	79.9	61.0	46.7	50.1	47.5
12/8/2020 2:35:32 PM	49.4	81.8	63.3	44.8	51.3	46.2
12/8/2020 2:36:32 PM	48.1	76.9	57.4	45.2	49.8	46.2
12/8/2020 2:37:32 PM	50.1	79.4	58.5	45.5	52.5	46.9
12/8/2020 2:38:32 PM	50.4	82.9	64.0	45.5	52.8	46.7
12/8/2020 2:39:32 PM	48.3	74.5	57.3	45.2	50.1	46.5
12/8/2020 2:40:32 PM	47.6	74.2	54.2	45.1	49.6	46.0
12/8/2020 2:41:32 PM	47.0	72.5	52.6	45.1	48.5	45.8
12/8/2020 2:42:32 PM	47.7	66.5	54.2	45.0	49.6	46.0
12/8/2020 2:43:32 PM	46.8	65.3	54.4	45.1	48.2	45.8
12/8/2020 2:44:32 PM	52.6	76.9	67.0	45.8	56.2	46.6
12/8/2020 2:45:32 PM	49.9	69.1	58.7	45.1	53.7	45.9
12/8/2020 2:46:32 PM	48.0	66.7	55.4	45.0	50.5	46.0
12/8/2020 2:47:32 PM	48.6	67.5	56.3	45.4	50.7	46.3
12/8/2020 2:48:32 PM	49.0	68.3	56.7	45.6	52.2	46.3
12/8/2020 2:49:32 PM	49.6	76.8	61.9	45.6	51.5	46.5
12/8/2020 2:50:32 PM	49.9	70.3	60.6	45.7	51.9	46.6
12/8/2020 2:51:32 PM	48.2	69.6	54.7	46.0	49.7	46.7
12/8/2020 2:52:32 PM	47.5	66.6	52.8	45.5	49.2	46.2
12/8/2020 2:53:32 PM	47.3	68.4	54.8	45.4	48.8	46.2
12/8/2020 2:54:32 PM	48.0	66.5	54.2	45.4	50.9	46.0
12/8/2020 2:55:32 PM	47.5	64.5	52.3	45.1	48.9	46.2
12/8/2020 2:56:32 PM	47.5	67.5	53.9	45.4	49.7	46.0
12/8/2020 2:57:32 PM	47.8	80.4	58.4	45.2	49.4	46.3
12/8/2020 2:58:32 PM	50.7	77.6	63.0	46.1	53.6	46.7
12/8/2020 2:59:32 PM	50.4	73.8	59.1	46.3	53.9	46.9
12/8/2020 3:00:32 PM	51.0	77.7	61.4	45.9	54.2	46.5
12/8/2020 3:01:32 PM	46.5	70.5	53.0	45.4	47.0	46.2
12/8/2020 3:02:32 PM	47.4	70.1	56.0	45.7	48.2	46.5
12/8/2020 3:03:32 PM	50.8	70.3	59.8	46.3	55.0	46.9
12/8/2020 3:04:32 PM	46.7	68.2	52.0	45.8	47.2	46.3
12/8/2020 3:05:32 PM	47.3	71.6	57.0	45.6	48.5	46.3
12/8/2020	45.7	61.2	47.2	44.6	46.7	45.3

Logged Data Table (cont'd)

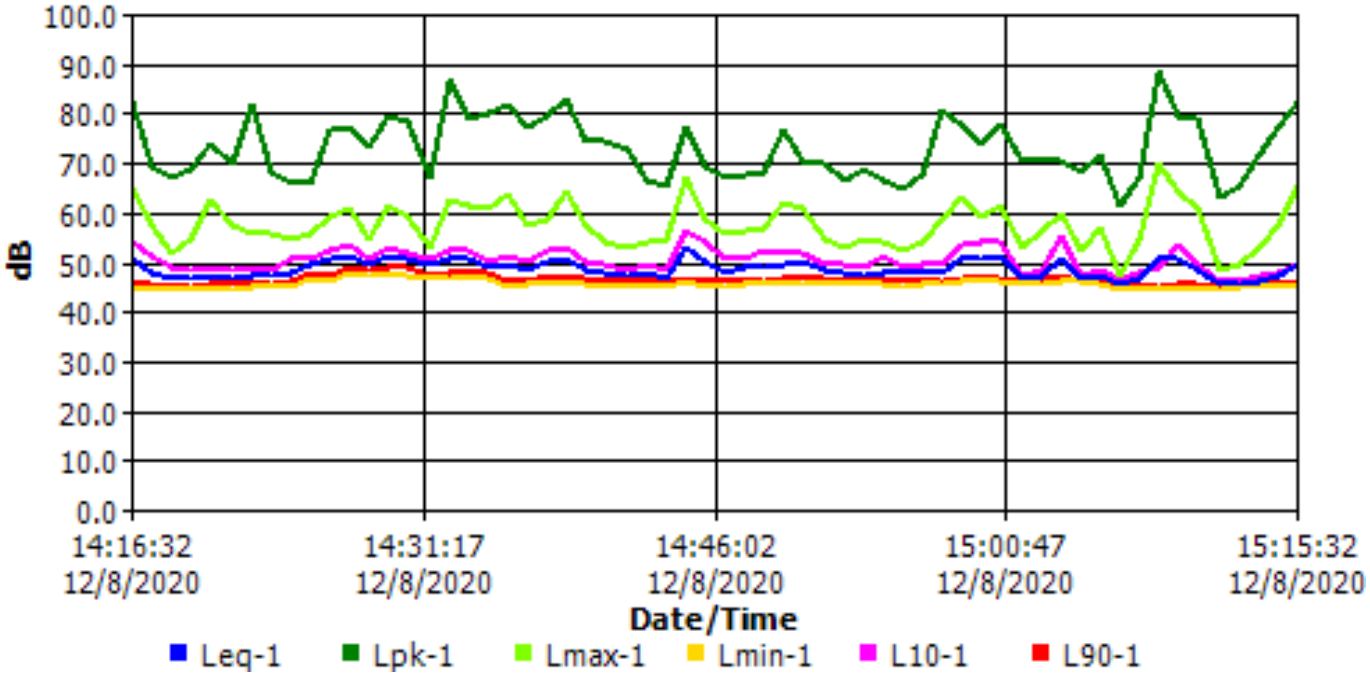
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/8/2020 3:07:32 PM	46.6	66.8	54.4	44.6	48.0	45.2
12/8/2020 3:08:32 PM	50.3	88.2	69.7	44.5	49.0	45.0
12/8/2020 3:09:32 PM	50.4	79.3	64.4	44.6	53.4	45.2
12/8/2020 3:10:32 PM	48.2	78.6	60.8	44.6	49.3	45.3
12/8/2020 3:11:32 PM	45.4	63.1	48.2	44.6	45.9	45.1
12/8/2020 3:12:32 PM	45.4	65.1	49.3	44.7	45.9	45.2
12/8/2020 3:13:32 PM	46.2	71.5	52.7	44.8	47.2	45.4
12/8/2020 3:14:32 PM	47.2	77.0	57.2	44.8	47.6	45.4
12/8/2020 3:15:32 PM	49.7	82.0	65.1	45.0	49.7	45.7

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	88.2 dB
Lmax	1	69.7 dB	Lmin	1	44.3 dB
Leq	1	48.8 dB	TWA	1	39.8 dB
Exchange Rate	1	3 dB	Int Threshold	1	80 dB
Log Rate	1	60 s	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Logged Data Chart



Session Report

12/9/2020

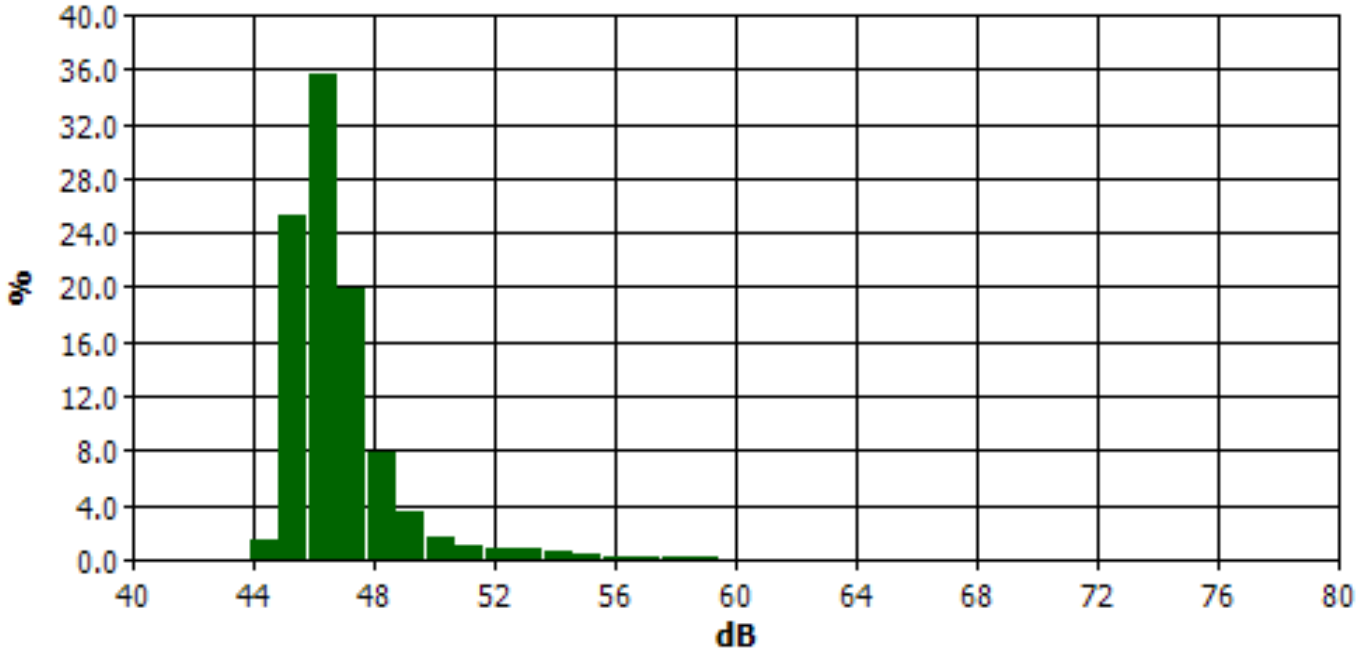
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK/ EV103 - 792 /2020
Location	N7 - Night time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Tuesday, December 08, 2020 21:03:21
Stop Time	Tuesday, December 08, 2020 22:03:21
User Name	JS
Comments	Human activities , domestic animals , insects ,genset .

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	48 dB	Dose	1	0 %
Lmin	1	44.1 dB	Lmax	1	73.3 dB
Lpk	1	91.6 dB	TWA	1	39 dB
L1	1	56.2 dB	L10	1	48.8 dB
L50	1	46.5 dB	L90	1	45.3 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



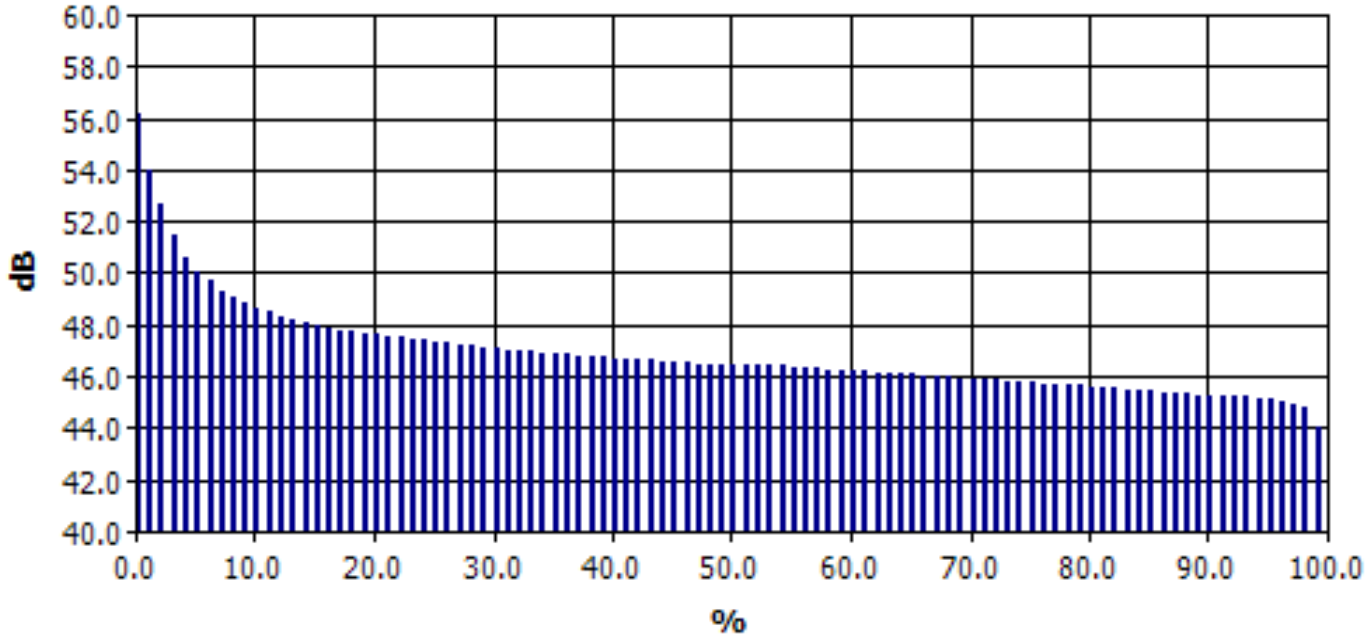
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.7	1.4
45.0	1.0	1.3	1.7	2.1	2.6	3.0	3.2	3.3	3.4	3.6	25.2
46.0	3.6	3.6	3.6	3.7	3.7	3.6	3.6	3.5	3.4	3.3	35.6
47.0	3.1	3.0	1.8	2.3	2.1	1.9	1.7	1.5	1.4	1.3	19.9
48.0	1.2	1.1	1.0	0.9	0.8	0.8	0.6	0.6	0.5	0.5	7.9
49.0	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.4
50.0	0.3	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	1.8
51.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
52.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
53.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
54.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.5
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		56.2	54.0	52.7	51.5	50.6	50.0	49.7	49.3	49.1
10%	48.8	48.6	48.5	48.3	48.2	48.1	48.0	47.9	47.8	47.8
20%	47.7	47.6	47.5	47.5	47.4	47.4	47.3	47.3	47.2	47.2
30%	47.1	47.1	47.0	47.0	47.0	46.9	46.9	46.9	46.8	46.8
40%	46.8	46.7	46.7	46.7	46.7	46.6	46.6	46.6	46.5	46.5
50%	46.5	46.5	46.4	46.4	46.4	46.4	46.3	46.3	46.3	46.2
60%	46.2	46.2	46.2	46.1	46.1	46.1	46.1	46.0	46.0	46.0
70%	45.9	45.9	45.9	45.9	45.8	45.8	45.8	45.7	45.7	45.7
80%	45.7	45.6	45.6	45.6	45.5	45.5	45.5	45.4	45.4	45.4
90%	45.3	45.3	45.3	45.2	45.2	45.1	45.1	45.0	44.9	44.8
100%	44.0									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/8/2020 9:04:21 PM	49.6	77.9	62.1	44.7	52.3	45.6
12/8/2020 9:05:21 PM	50.4	84.0	65.7	45.7	54.0	46.5
12/8/2020 9:06:21 PM	48.8	78.4	63.2	45.4	50.0	46.2
12/8/2020 9:07:21 PM	48.5	72.3	61.6	44.9	51.8	45.5
12/8/2020 9:08:21 PM	46.2	64.4	50.5	44.5	47.3	45.3
12/8/2020 9:09:21 PM	47.8	77.7	64.7	44.6	48.4	45.4
12/8/2020	45.5	67.0	52.4	44.4	46.0	45.0

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/8/2020 9:11:21 PM	47.2	72.7	62.8	44.6	47.5	45.4
12/8/2020 9:12:21 PM	49.2	68.9	58.6	44.7	53.0	45.6
12/8/2020 9:13:21 PM	49.0	73.8	63.3	45.0	49.1	45.7
12/8/2020 9:14:21 PM	45.7	58.9	46.8	44.8	46.2	45.4
12/8/2020 9:15:21 PM	46.8	71.2	55.9	45.2	47.6	46.0
12/8/2020 9:16:21 PM	46.6	62.1	49.8	45.2	47.6	45.9
12/8/2020 9:17:21 PM	46.1	63.1	53.6	44.9	46.6	45.7
12/8/2020 9:18:21 PM	46.5	61.1	50.2	45.3	47.3	45.9
12/8/2020 9:19:21 PM	46.1	60.5	47.9	45.0	46.8	45.7
12/8/2020 9:20:21 PM	46.0	59.6	48.2	44.8	46.7	45.6
12/8/2020 9:21:21 PM	46.6	62.5	49.7	45.0	47.7	45.8
12/8/2020 9:22:21 PM	48.3	78.5	60.0	45.5	50.2	46.5
12/8/2020 9:23:21 PM	49.5	81.6	64.6	45.5	51.4	46.5
12/8/2020 9:24:21 PM	47.8	77.2	60.5	45.6	48.9	46.5
12/8/2020 9:25:21 PM	47.2	72.3	57.9	45.3	48.1	46.2
12/8/2020 9:26:21 PM	49.5	74.1	62.9	44.9	50.4	46.0
12/8/2020 9:27:21 PM	49.1	73.2	64.0	45.8	50.0	46.7
12/8/2020 9:28:21 PM	48.3	68.1	57.4	46.1	49.6	47.0
12/8/2020 9:29:21 PM	48.0	74.5	59.2	45.8	48.7	46.8
12/8/2020 9:30:21 PM	50.8	82.5	65.0	45.7	53.2	46.6
12/8/2020 9:31:21 PM	51.5	91.6	73.3	45.3	50.7	46.2
12/8/2020 9:32:21 PM	48.4	77.4	63.1	44.9	50.4	45.9
12/8/2020 9:33:21 PM	49.6	85.0	65.6	44.8	51.1	45.9
12/8/2020 9:34:21 PM	46.5	75.3	54.9	44.7	47.4	45.6
12/8/2020 9:35:21 PM	46.9	70.0	56.4	44.9	48.6	45.5
12/8/2020 9:36:21 PM	46.8	70.1	56.4	44.6	48.1	45.4
12/8/2020 9:37:21 PM	47.0	66.9	55.0	44.4	49.2	45.4
12/8/2020 9:38:21 PM	47.2	76.3	61.1	44.6	48.7	45.5
12/8/2020 9:39:21 PM	47.3	71.1	58.3	44.8	48.8	45.6
12/8/2020 9:40:21 PM	47.2	64.9	53.4	44.8	49.0	45.5
12/8/2020 9:41:21 PM	47.0	67.4	52.0	44.8	48.4	45.6
12/8/2020 9:42:21 PM	49.5	81.9	65.2	44.5	49.8	45.4
12/8/2020 9:43:21 PM	47.9	69.7	57.8	44.7	49.7	45.4
12/8/2020 9:44:21 PM	46.8	68.5	54.6	45.0	47.9	45.7
12/8/2020 9:45:21 PM	46.4	65.5	50.5	44.7	47.6	45.5
12/8/2020 9:46:21 PM	48.7	82.0	67.4	44.2	49.0	45.0
12/8/2020 9:47:21 PM	45.3	71.1	53.5	44.1	45.8	44.9
12/8/2020 9:48:21 PM	45.5	60.7	48.1	44.6	46.0	45.1
12/8/2020	45.7	60.4	48.9	44.4	46.6	45.0

Logged Data Table (cont'd)

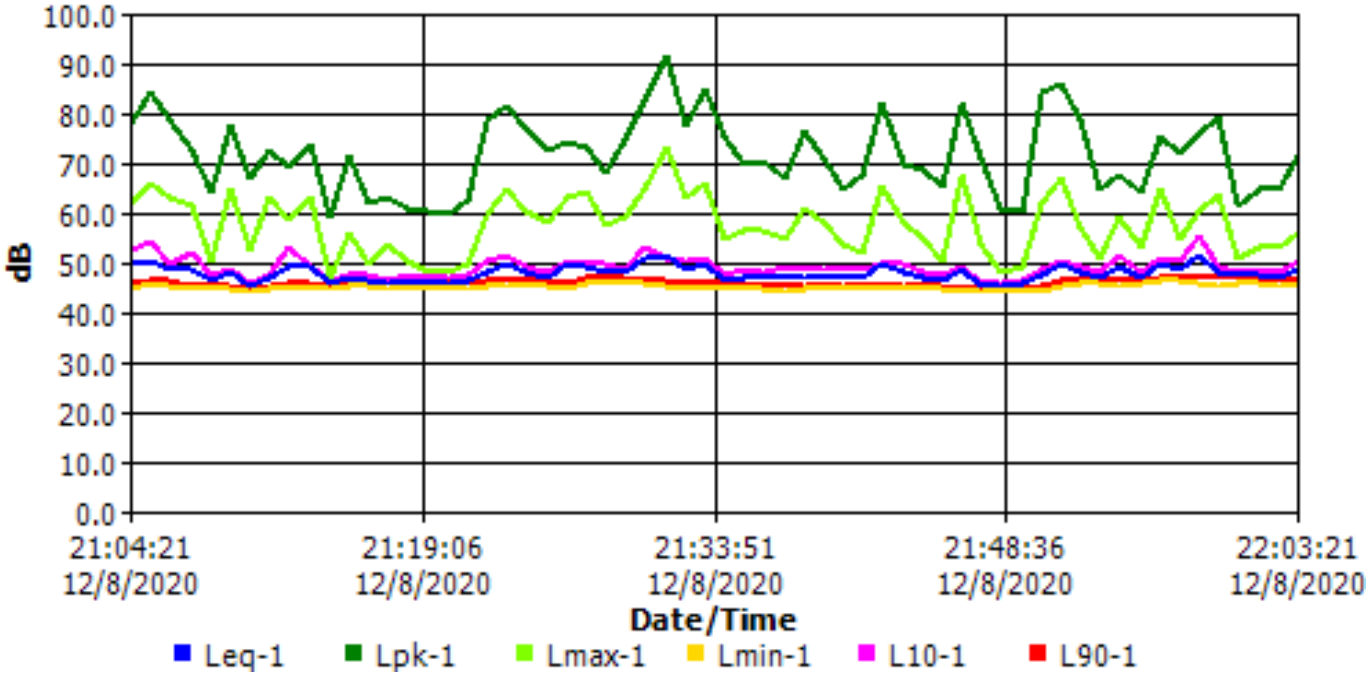
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/8/2020 9:50:21 PM	47.6	83.9	61.8	44.3	48.8	45.3
12/8/2020 9:51:21 PM	49.8	85.9	67.2	45.4	50.1	46.2
12/8/2020 9:52:21 PM	47.8	78.8	56.8	45.6	49.3	46.4
12/8/2020 9:53:21 PM	47.2	64.9	50.7	45.6	48.2	46.4
12/8/2020 9:54:21 PM	49.4	67.4	59.4	45.4	51.3	46.6
12/8/2020 9:55:21 PM	47.2	64.2	53.1	45.6	48.2	46.5
12/8/2020 9:56:21 PM	49.8	75.5	64.8	46.2	50.9	46.9
12/8/2020 9:57:21 PM	48.5	71.8	55.0	46.3	50.1	46.9
12/8/2020 9:58:21 PM	51.6	75.9	60.3	45.9	55.3	46.8
12/8/2020 9:59:21 PM	48.2	79.0	63.5	45.5	49.4	46.7
12/8/2020 10:00:21 PM	47.4	61.3	50.7	46.1	48.2	46.9
12/8/2020 10:01:21 PM	47.4	64.9	53.3	45.6	48.4	46.4
12/8/2020 10:02:21 PM	46.9	64.6	53.0	45.5	47.8	46.3
12/8/2020 10:03:21 PM	48.6	71.4	55.6	45.9	50.3	46.9

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	91.6 dB
Lmax	1	73.3 dB	Lmin	1	44.1 dB
Leq	1	48 dB	TWA	1	39 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

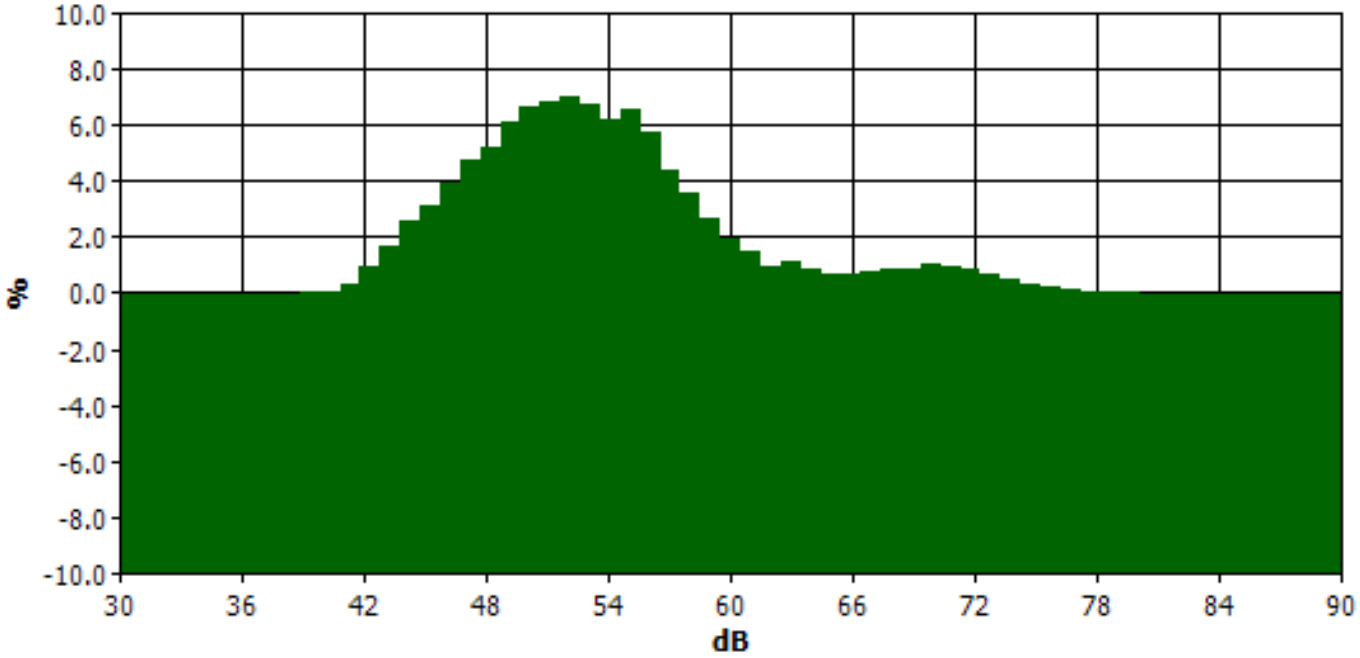
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK/EV103 - 792 / 2020
Location	N8 - Day time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Friday, December 18, 2020 16:10:00
Stop Time	Friday, December 18, 2020 17:10:00
User Name	JS / MB
Comments	Domestic animals , birds sound , insects ,boat movement ,vehicles movement , human activities.

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	61.7 dB	Dose	1	0 %
Lmin	1	39.9 dB	Lmax	1	80.4 dB
Lpk	1	90.7 dB	TWA	1	52.7 dB
L1	1	74.1 dB	L10	1	63.2 dB
L50	1	52.9 dB	L90	1	46.2 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



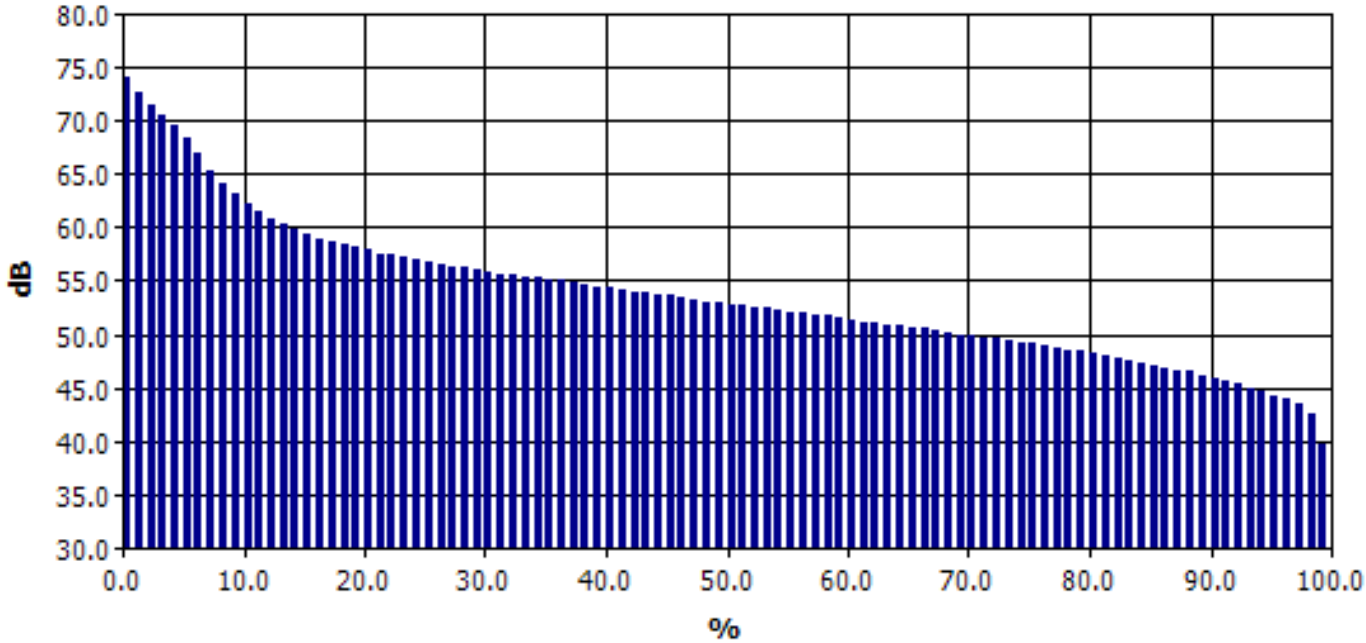
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3
42.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
43.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.7
44.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	2.6
45.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.1
46.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.0

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
47.0	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	4.7
48.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	5.2
49.0	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	6.1
50.0	0.7	0.8	0.5	0.7	0.7	0.7	0.6	0.7	0.7	0.7	6.6
51.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	6.8
52.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	7.0
53.0	0.8	0.8	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.6	6.7
54.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	6.2
55.0	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	6.6
56.0	0.7	0.7	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	5.8
57.0	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	4.4
58.0	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	3.6
59.0	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	2.7
60.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.9
61.0	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	1.5
62.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
63.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
64.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
65.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
66.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6
67.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
68.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
69.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
70.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
71.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
72.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
73.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
74.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.5
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
84.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
86.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		74.1	72.6	71.5	70.5	69.5	68.3	67.0	65.4	64.2
10%	63.2	62.3	61.4	60.8	60.3	59.8	59.4	59.0	58.7	58.4
20%	58.1	57.9	57.6	57.4	57.2	57.0	56.8	56.6	56.4	56.2
30%	56.0	55.9	55.7	55.6	55.4	55.3	55.1	55.0	54.8	54.7
40%	54.5	54.3	54.2	54.0	53.9	53.7	53.6	53.4	53.3	53.1
50%	52.9	52.8	52.7	52.5	52.4	52.3	52.1	52.0	51.8	51.7
60%	51.5	51.4	51.2	51.1	50.9	50.8	50.6	50.5	50.3	50.2
70%	50.0	49.9	49.7	49.6	49.4	49.3	49.1	48.9	48.7	48.6
80%	48.4	48.2	48.0	47.8	47.6	47.4	47.1	46.9	46.7	46.5
90%	46.2	45.9	45.6	45.3	45.0	44.7	44.3	43.9	43.4	42.6
100%	39.8									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/18/2020 4:11:00 PM	63.8	86.0	75.4	44.8	70.3	50.0
12/18/2020 4:12:00 PM	65.0	87.5	77.7	43.5	69.9	46.4
12/18/2020 4:13:00 PM	67.7	87.1	78.4	41.6	73.5	47.5
12/18/2020 4:14:00 PM	67.9	88.5	77.4	43.8	73.1	48.8
12/18/2020 4:15:00 PM	67.1	88.2	78.1	46.1	72.4	49.5
12/18/2020 4:16:00 PM	65.0	90.2	78.1	42.5	70.0	47.7
12/18/2020 4:17:00 PM	63.8	88.3	76.0	42.7	68.5	47.6
12/18/2020 4:18:00 PM	62.6	90.7	77.4	42.8	66.8	50.4
12/18/2020 4:19:00 PM	63.1	86.9	75.8	43.4	67.0	49.3
12/18/2020 4:20:00 PM	60.4	86.7	74.5	41.4	62.7	46.3
12/18/2020 4:21:00 PM	60.3	86.2	75.4	41.8	60.5	46.9
12/18/2020 4:22:00 PM	60.3	85.3	74.7	40.5	61.8	45.7
12/18/2020 4:23:00 PM	60.1	85.3	74.9	41.6	59.8	45.1
12/18/2020 4:24:00 PM	61.6	85.5	76.9	43.2	63.1	48.2
12/18/2020 4:25:00 PM	63.2	87.7	79.7	43.3	67.1	47.2
12/18/2020 4:26:00 PM	62.1	88.4	80.4	41.6	62.9	47.0
12/18/2020 4:27:00 PM	57.6	84.4	74.1	42.5	58.0	48.5
12/18/2020 4:28:00 PM	52.8	77.6	63.5	41.5	56.1	45.6
12/18/2020 4:29:00 PM	61.1	87.9	78.4	42.6	59.2	46.1
12/18/2020 4:30:00 PM	55.4	76.3	65.0	42.3	59.5	45.6
12/18/2020 4:31:00 PM	52.8	75.2	61.8	43.0	56.3	46.5
12/18/2020 4:32:00 PM	53.3	76.2	61.1	42.6	57.0	46.9
12/18/2020 4:33:00 PM	60.6	85.0	74.5	42.7	62.8	47.4
12/18/2020 4:34:00 PM	62.8	87.2	78.6	41.5	66.9	46.5
12/18/2020 4:35:00 PM	60.0	88.5	79.2	44.9	60.1	49.9
12/18/2020 4:36:00 PM	52.2	75.7	59.3	42.5	55.7	45.9
12/18/2020 4:37:00 PM	58.3	83.8	74.4	42.2	60.6	45.6
12/18/2020 4:38:00 PM	59.5	86.4	77.3	41.6	60.6	45.9
12/18/2020 4:39:00 PM	61.5	83.3	77.6	41.1	66.1	43.4
12/18/2020 4:40:00 PM	64.4	84.8	76.4	41.3	70.6	44.9
12/18/2020 4:41:00 PM	62.9	87.2	77.9	41.4	66.3	45.9
12/18/2020 4:42:00 PM	64.4	86.6	76.9	40.9	70.3	44.8
12/18/2020 4:43:00 PM	61.1	87.3	76.3	42.0	62.6	49.0
12/18/2020 4:44:00 PM	53.1	77.0	63.5	40.5	56.3	46.6
12/18/2020 4:45:00 PM	53.8	76.9	64.2	40.2	58.7	43.0
12/18/2020 4:46:00 PM	59.7	86.7	74.8	39.9	60.0	43.7
12/18/2020 4:47:00 PM	58.3	86.9	74.1	41.3	59.3	43.8
12/18/2020 4:48:00 PM	53.3	77.0	62.3	41.6	57.1	44.3

Logged Data Table (cont'd)

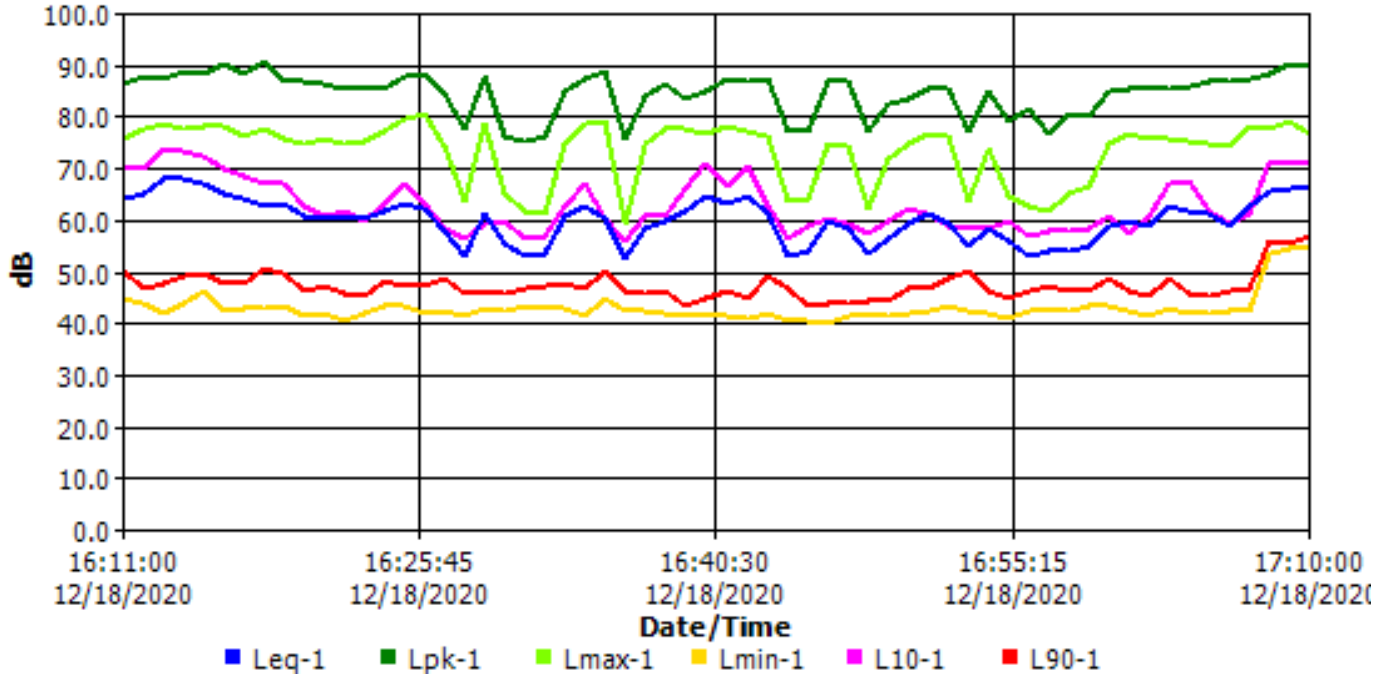
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/18/2020 4:50:00 PM	59.4	83.5	74.5	41.9	62.3	46.5
12/18/2020 4:51:00 PM	60.9	85.5	76.7	42.2	61.2	46.8
12/18/2020 4:52:00 PM	59.1	85.2	75.9	43.1	58.5	48.6
12/18/2020 4:53:00 PM	54.8	77.0	63.5	42.2	58.4	49.9
12/18/2020 4:54:00 PM	58.0	84.8	73.7	41.6	58.3	46.2
12/18/2020 4:55:00 PM	55.6	78.9	64.6	40.6	59.8	44.7
12/18/2020 4:56:00 PM	53.1	81.2	62.4	42.1	56.8	46.1
12/18/2020 4:57:00 PM	53.7	76.5	61.6	42.9	57.7	46.9
12/18/2020 4:58:00 PM	53.9	80.6	65.1	42.2	57.7	45.9
12/18/2020 4:59:00 PM	54.6	80.0	66.6	43.0	58.3	46.1
12/18/2020 5:00:00 PM	58.8	84.9	74.5	43.1	60.4	48.5
12/18/2020 5:01:00 PM	59.5	85.5	76.8	42.3	57.2	46.2
12/18/2020 5:02:00 PM	58.8	85.3	75.4	41.3	60.6	45.2
12/18/2020 5:03:00 PM	62.7	85.4	75.8	42.8	66.8	48.4
12/18/2020 5:04:00 PM	61.7	85.9	75.2	41.9	67.4	45.8
12/18/2020 5:05:00 PM	61.0	86.7	74.7	41.7	61.6	45.1
12/18/2020 5:06:00 PM	58.5	86.8	74.0	42.5	59.1	46.2
12/18/2020 5:07:00 PM	62.4	87.2	78.0	42.3	61.0	46.8
12/18/2020 5:08:00 PM	65.7	88.4	77.7	53.2	71.2	55.8
12/18/2020 5:09:00 PM	66.0	90.1	79.2	54.4	71.0	55.3
12/18/2020 5:10:00 PM	66.4	89.4	76.7	54.2	70.6	56.9

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	90.7 dB
Lmax	1	80.4 dB	Lmin	1	39.9 dB
Leq	1	61.7 dB	TWA	1	52.7 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

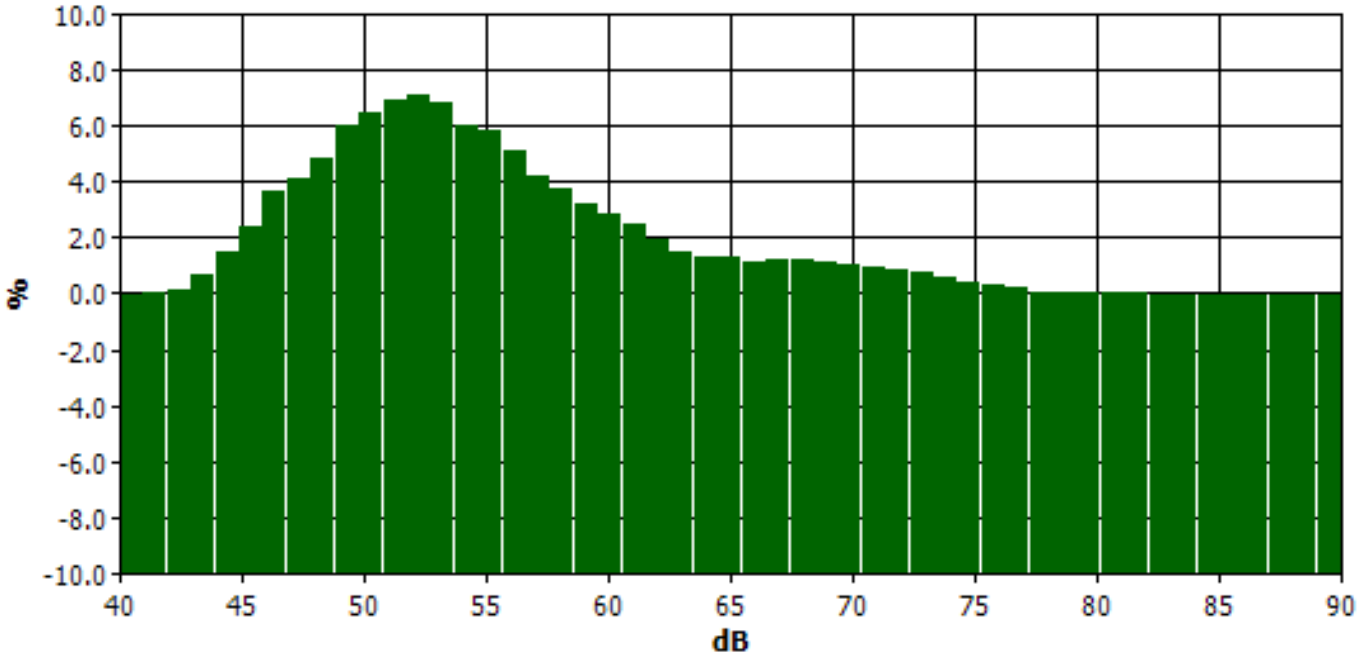
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK / EV103 - 792 / 2020
Location	N8 - Night time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Friday, December 18, 2020 20:26:42
Stop Time	Friday, December 18, 2020 21:33:54
User Name	JS / MB
Comments	Human activities ,domestic animals , birds sound , genset , insects

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	62.9 dB	Dose	1	0 %
Lmin	1	41.9 dB	Lmax	1	82 dB
Lpk	1	93.2 dB	TWA	1	54.3 dB
L1	1	75 dB	L10	1	65.9 dB
L50	1	53.8 dB	L90	1	47.3 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



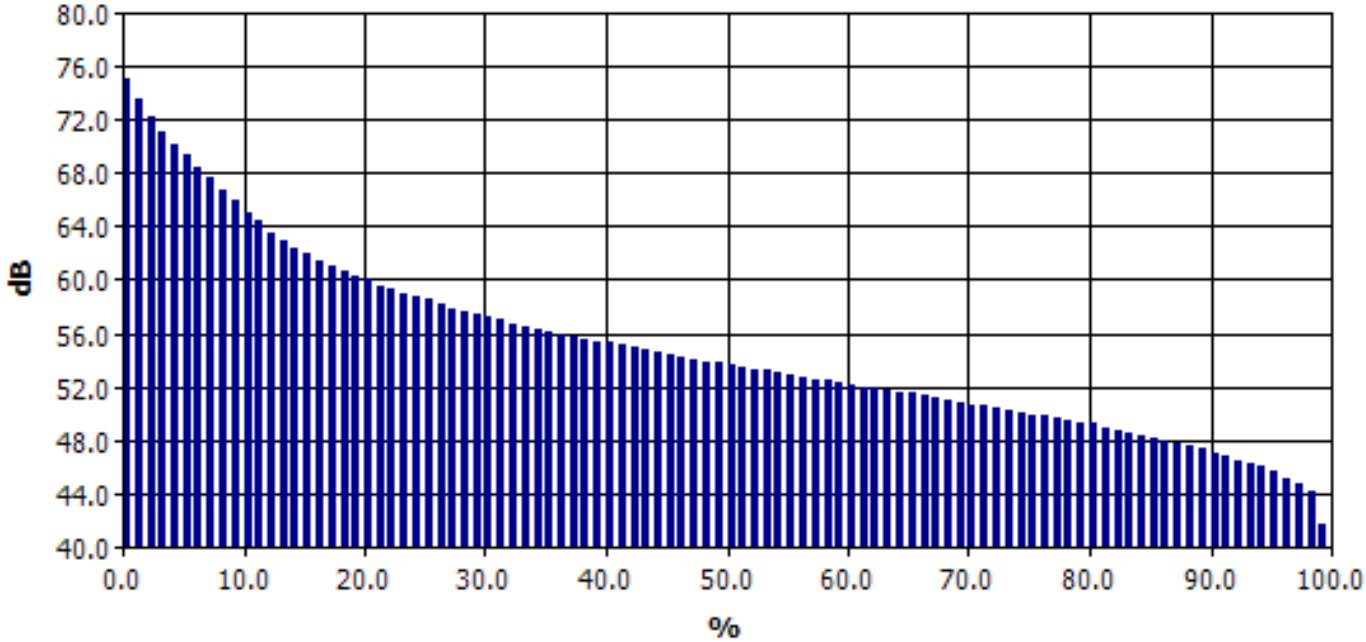
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
43.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6
44.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	1.5
45.0	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	2.4
46.0	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	3.7
47.0	0.5	0.5	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.2
48.0	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	4.8
49.0	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	6.0
50.0	0.7	0.7	0.4	0.6	0.7	0.6	0.7	0.7	0.7	0.6	6.4
51.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	6.9
52.0	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.8	7.1
53.0	0.8	0.8	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.6	6.8
54.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	6.0
55.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	5.8
56.0	0.6	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5.1
57.0	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.2
58.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	3.7

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
59.0	0.4	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.2
60.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.8
61.0	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	2.5
62.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.9
63.0	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	1.5
64.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.3
65.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.3
66.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1
67.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
68.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.3
69.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
70.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1
71.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
72.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
73.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
74.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.6
75.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
84.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
86.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		75.0	73.5	72.2	71.1	70.2	69.3	68.4	67.7	66.8
10%	65.9	65.1	64.4	63.6	63.0	62.4	61.9	61.5	61.1	60.7
20%	60.3	60.0	59.6	59.3	59.0	58.7	58.5	58.2	57.9	57.7
30%	57.4	57.2	57.0	56.7	56.5	56.3	56.2	56.0	55.8	55.6
40%	55.4	55.3	55.1	54.9	54.8	54.6	54.4	54.2	54.1	53.9
50%	53.8	53.6	53.5	53.3	53.2	53.0	52.9	52.7	52.6	52.5
60%	52.3	52.2	52.0	51.9	51.8	51.6	51.5	51.3	51.2	51.0
70%	50.9	50.7	50.6	50.4	50.3	50.1	49.9	49.8	49.7	49.5
80%	49.3	49.2	49.0	48.8	48.6	48.4	48.2	48.0	47.8	47.5
90%	47.3	47.0	46.8	46.5	46.3	46.0	45.6	45.2	44.7	44.1
100%	41.8									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/18/2020 9:00:42 PM	61.1	84.0	75.3	43.6	64.9	47.7
12/18/2020 9:01:42 PM	61.9	86.5	76.8	44.9	65.3	50.5
12/18/2020 9:02:42 PM	62.2	86.5	77.0	45.5	65.5	48.6
12/18/2020	58.9	83.5	74.0	44.9	60.7	47.6

Logged Data Table (cont'd)

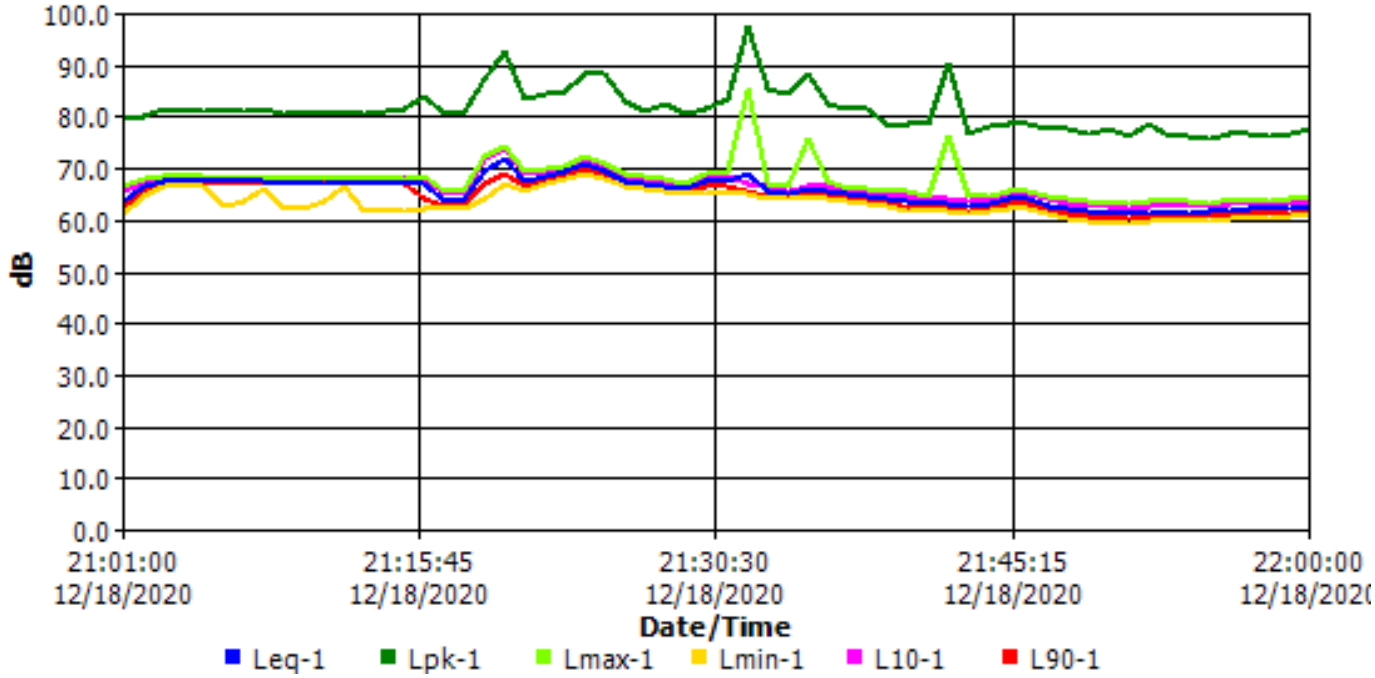
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/18/2020 9:04:42 PM	56.6	82.7	71.1	44.6	59.3	47.9
12/18/2020 9:05:42 PM	62.1	85.7	76.1	45.1	66.5	49.8
12/18/2020 9:06:42 PM	64.3	87.4	77.5	46.7	69.4	50.1
12/18/2020 9:07:42 PM	63.7	85.2	76.4	44.8	68.9	50.7
12/18/2020 9:08:42 PM	65.6	89.2	79.8	45.6	71.0	50.5
12/18/2020 9:09:42 PM	67.5	93.2	80.1	45.1	73.4	48.2
12/18/2020 9:10:42 PM	67.5	93.1	81.9	43.2	72.3	50.1
12/18/2020 9:11:42 PM	64.1	92.1	80.0	43.3	68.1	46.8
12/18/2020 9:12:42 PM	63.1	87.1	76.4	43.1	67.4	48.0
12/18/2020 9:13:42 PM	64.1	87.3	77.7	43.1	68.7	48.4
12/18/2020 9:14:42 PM	62.6	87.1	76.6	43.8	66.6	47.8
12/18/2020 9:15:42 PM	61.7	85.4	77.5	46.6	64.3	50.9
12/18/2020 9:16:42 PM	62.6	84.3	76.4	45.1	68.2	48.0
12/18/2020 9:17:42 PM	63.1	86.0	76.0	43.2	68.5	46.8
12/18/2020 9:18:42 PM	64.8	87.0	77.9	43.4	69.5	47.7
12/18/2020 9:19:42 PM	64.0	87.6	77.6	43.6	69.0	47.6
12/18/2020 9:20:42 PM	63.0	87.2	76.5	43.3	67.5	46.8
12/18/2020 9:21:42 PM	62.3	86.3	76.1	44.0	67.0	48.5
12/18/2020 9:22:42 PM	62.9	86.7	75.1	43.6	67.2	47.7
12/18/2020 9:23:42 PM	59.0	86.4	76.5	43.7	61.7	48.2
12/18/2020 9:24:42 PM	56.4	80.6	69.1	43.5	59.1	48.7
12/18/2020 9:25:42 PM	56.7	82.4	69.3	43.4	60.8	46.4
12/18/2020 9:26:42 PM	56.2	80.9	69.4	41.9	59.8	45.4
12/18/2020 9:27:42 PM	58.3	84.7	75.3	42.6	61.1	45.1
12/18/2020 9:28:42 PM	53.1	77.8	62.3	42.1	56.8	44.9
12/18/2020 9:29:42 PM	54.4	76.9	63.3	42.7	58.8	44.6
12/18/2020 9:30:42 PM	55.6	79.7	67.5	42.7	59.6	45.4
12/18/2020 9:31:42 PM	55.1	77.7	64.3	42.1	59.8	44.9
12/18/2020 9:32:42 PM	55.1	78.1	64.1	42.2	58.3	48.2
12/18/2020 9:33:42 PM	53.4	88.8	68.9	42.5	55.8	45.8

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	97.2 dB
Lmax	1	85.4 dB	Lmin	1	59.1 dB
Leq	1	66.1 dB	TWA	1	57 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

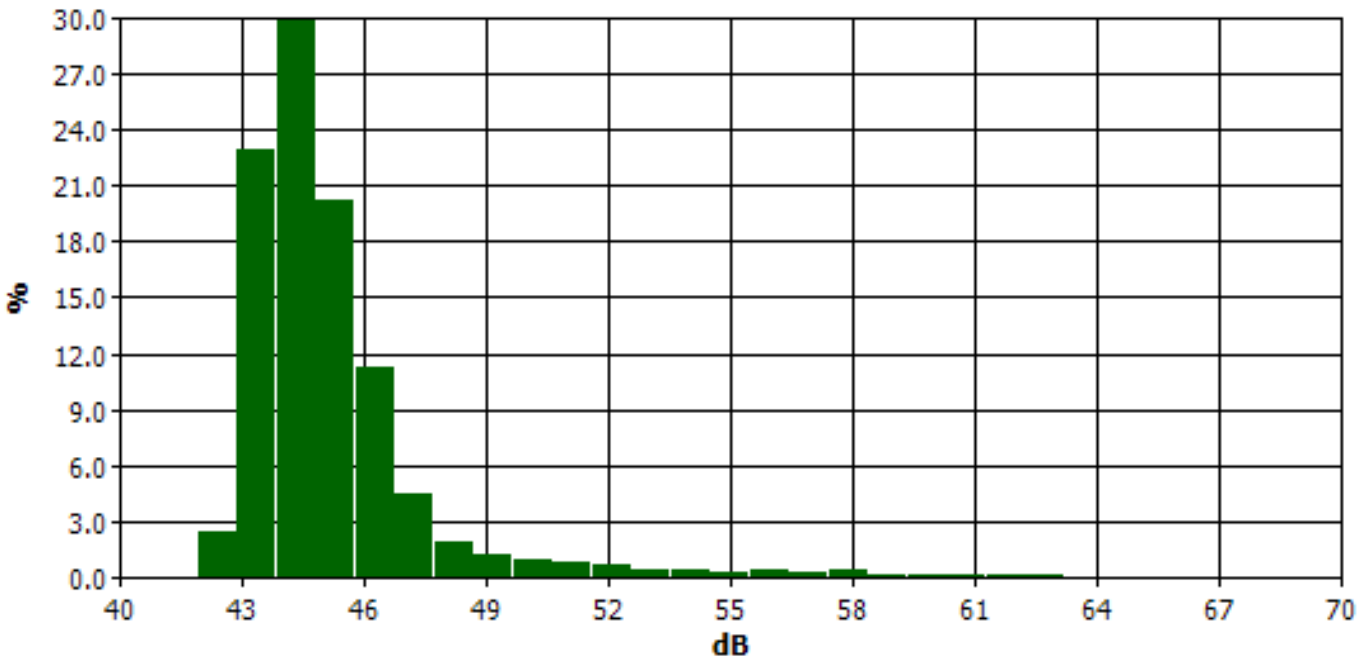
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK/EV103 - 792 / 2020
Location	N9 - Day time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Thursday, December 17, 2020 14:00:00
Stop Time	Thursday, December 17, 2020 15:00:00
User Name	JS / MB
Comments	Boat movement , domestic animals ,genset , human activities.

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	47.2 dB	Dose	1	0 %
Lmin	1	41.7 dB	Lmax	1	66.2 dB
Lpk	1	76.4 dB	TWA	1	38.2 dB
L1	1	58.2 dB	L10	1	47.4 dB
L50	1	44.6 dB	L90	1	43.3 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



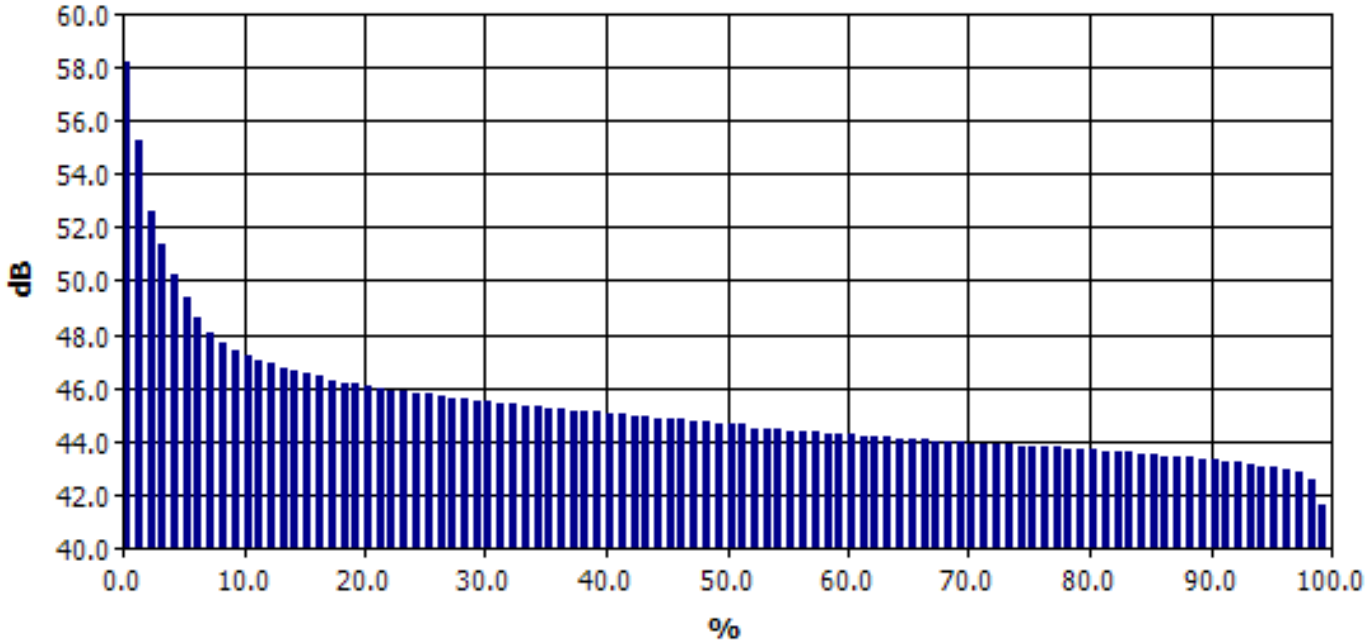
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.9	2.5
43.0	1.1	1.4	1.7	2.0	2.2	2.4	2.6	2.9	3.2	3.5	22.9
44.0	3.6	3.3	2.6	3.2	3.2	3.1	3.0	2.8	2.6	2.4	29.9
45.0	2.4	2.2	2.1	2.1	2.1	2.1	2.0	1.9	1.8	1.6	20.2
46.0	1.5	1.5	1.4	1.3	1.1	1.0	1.0	0.8	0.9	0.8	11.3
47.0	0.7	0.6	0.3	0.5	0.5	0.4	0.4	0.3	0.3	0.3	4.5
48.0	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	1.9
49.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.3
50.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
51.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
52.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.7
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		58.2	55.3	52.6	51.4	50.2	49.4	48.6	48.1	47.7
10%	47.4	47.2	47.0	46.9	46.7	46.6	46.5	46.4	46.3	46.2
20%	46.2	46.1	46.0	45.9	45.9	45.8	45.8	45.7	45.6	45.6
30%	45.5	45.5	45.4	45.4	45.3	45.3	45.2	45.2	45.1	45.1
40%	45.1	45.0	45.0	44.9	44.9	44.8	44.8	44.8	44.7	44.7
50%	44.6	44.6	44.6	44.5	44.5	44.5	44.4	44.4	44.4	44.3
60%	44.3	44.3	44.2	44.2	44.2	44.1	44.1	44.1	44.0	44.0
70%	44.0	43.9	43.9	43.9	43.9	43.8	43.8	43.8	43.8	43.7
80%	43.7	43.7	43.6	43.6	43.6	43.5	43.5	43.4	43.4	43.4
90%	43.3	43.3	43.2	43.2	43.1	43.0	43.0	42.9	42.8	42.6
100%	41.6									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/17/2020 2:01:00 PM	49.1	69.0	54.2	44.5	51.6	46.2
12/17/2020 2:02:00 PM	46.9	75.1	58.2	43.8	48.2	45.3
12/17/2020 2:03:00 PM	46.5	68.4	49.9	44.3	47.8	45.4
12/17/2020 2:04:00 PM	46.4	66.8	52.3	43.8	48.0	44.4
12/17/2020 2:05:00 PM	46.1	66.1	50.0	43.6	47.5	44.6
12/17/2020 2:06:00 PM	46.9	64.4	49.9	45.0	48.1	45.8
12/17/2020 2:07:00 PM	44.5	60.6	47.1	42.7	45.5	43.4
12/17/2020 2:08:00 PM	43.4	62.1	46.0	41.7	44.0	42.9
12/17/2020 2:09:00 PM	43.2	69.3	51.8	42.1	43.8	42.7
12/17/2020 2:10:00 PM	43.4	65.5	50.8	42.4	43.9	43.0
12/17/2020 2:11:00 PM	49.1	66.5	54.4	42.5	52.4	43.4
12/17/2020	55.9	72.1	59.5	48.9	58.7	50.3

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/17/2020 2:13:00 PM	47.9	63.3	51.7	44.7	49.5	46.3
12/17/2020 2:14:00 PM	46.0	65.8	50.3	43.5	47.5	44.4
12/17/2020 2:15:00 PM	44.8	64.2	54.1	43.0	45.6	43.7
12/17/2020 2:16:00 PM	44.1	59.3	48.2	42.9	44.8	43.5
12/17/2020 2:17:00 PM	43.7	60.8	47.1	42.3	44.6	43.2
12/17/2020 2:18:00 PM	43.9	62.6	48.5	42.4	44.8	43.2
12/17/2020 2:19:00 PM	44.2	61.0	48.0	42.5	45.5	43.3
12/17/2020 2:20:00 PM	43.5	60.8	47.0	42.2	44.4	42.9
12/17/2020 2:21:00 PM	43.7	61.1	46.1	42.3	44.6	43.0
12/17/2020 2:22:00 PM	45.5	66.1	51.9	43.1	47.2	44.1
12/17/2020 2:23:00 PM	46.4	64.4	52.8	43.5	48.9	44.4
12/17/2020 2:24:00 PM	45.3	67.6	49.7	42.6	47.1	43.6
12/17/2020 2:25:00 PM	44.6	69.8	49.9	42.2	46.2	43.2
12/17/2020 2:26:00 PM	46.2	76.4	63.0	42.3	46.2	43.3
12/17/2020 2:27:00 PM	46.2	67.9	55.4	43.6	47.6	44.3
12/17/2020 2:28:00 PM	46.4	72.8	52.8	42.9	48.2	44.0
12/17/2020 2:29:00 PM	45.1	62.0	49.8	42.8	46.4	44.0
12/17/2020 2:30:00 PM	45.1	63.5	51.8	43.4	46.1	44.1
12/17/2020 2:31:00 PM	45.0	62.7	51.0	43.6	45.6	44.2
12/17/2020 2:32:00 PM	45.6	62.8	48.5	44.0	46.3	44.9
12/17/2020 2:33:00 PM	45.9	65.1	48.8	44.7	46.5	45.5
12/17/2020 2:34:00 PM	46.2	61.3	48.3	45.0	46.8	45.7
12/17/2020 2:35:00 PM	47.6	74.0	60.7	44.5	46.8	45.2
12/17/2020 2:36:00 PM	45.8	67.7	53.4	44.4	46.3	45.3
12/17/2020 2:37:00 PM	45.3	61.6	48.7	44.0	46.0	44.8
12/17/2020 2:38:00 PM	45.2	62.4	46.8	43.2	46.3	44.2
12/17/2020 2:39:00 PM	44.5	60.9	46.8	43.1	45.3	43.9
12/17/2020 2:40:00 PM	44.7	61.8	48.3	42.8	45.8	43.8
12/17/2020 2:41:00 PM	44.2	59.5	46.7	42.7	45.1	43.6
12/17/2020 2:42:00 PM	43.9	61.0	46.1	42.3	44.6	43.2
12/17/2020 2:43:00 PM	44.0	62.1	45.8	42.4	44.7	43.4
12/17/2020 2:44:00 PM	44.3	60.4	48.1	42.9	45.0	43.7
12/17/2020 2:45:00 PM	44.6	61.8	47.5	43.1	45.5	44.0
12/17/2020 2:46:00 PM	44.5	62.4	49.1	42.7	45.5	43.6
12/17/2020 2:47:00 PM	44.7	72.9	57.2	42.3	45.0	43.4
12/17/2020 2:48:00 PM	43.8	72.0	52.0	42.5	44.3	43.3
12/17/2020 2:49:00 PM	44.1	73.8	46.0	42.5	44.9	43.4
12/17/2020 2:50:00 PM	44.9	60.3	46.3	43.7	45.6	44.4
12/17/2020	44.8	64.5	47.8	43.5	45.7	44.3

Logged Data Table (cont'd)

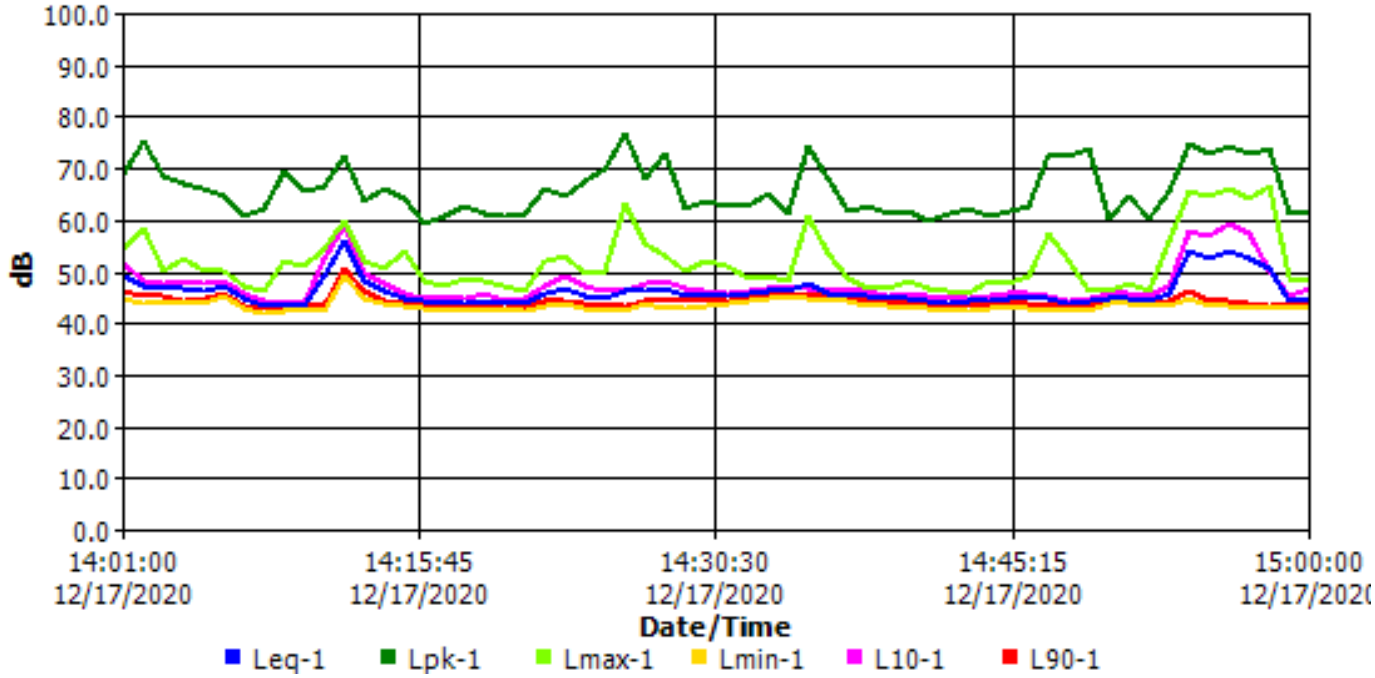
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/17/2020 2:52:00 PM	44.4	60.0	46.1	43.2	45.2	43.9
12/17/2020 2:53:00 PM	45.7	65.3	55.6	43.4	47.1	44.2
12/17/2020 2:54:00 PM	54.0	74.4	65.3	44.7	57.6	46.2
12/17/2020 2:55:00 PM	52.3	72.7	64.4	43.1	56.8	44.0
12/17/2020 2:56:00 PM	53.9	74.3	65.8	43.2	59.4	44.1
12/17/2020 2:57:00 PM	52.2	72.8	64.1	42.8	57.2	43.8
12/17/2020 2:58:00 PM	50.6	73.6	66.2	42.6	49.9	43.4
12/17/2020 2:59:00 PM	44.2	60.9	48.7	42.9	45.2	43.6
12/17/2020 3:00:00 PM	44.9	61.0	48.1	42.9	46.6	43.7

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	76.4 dB
Lmax	1	66.2 dB	Lmin	1	41.7 dB
Leq	1	47.2 dB	TWA	1	38.2 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

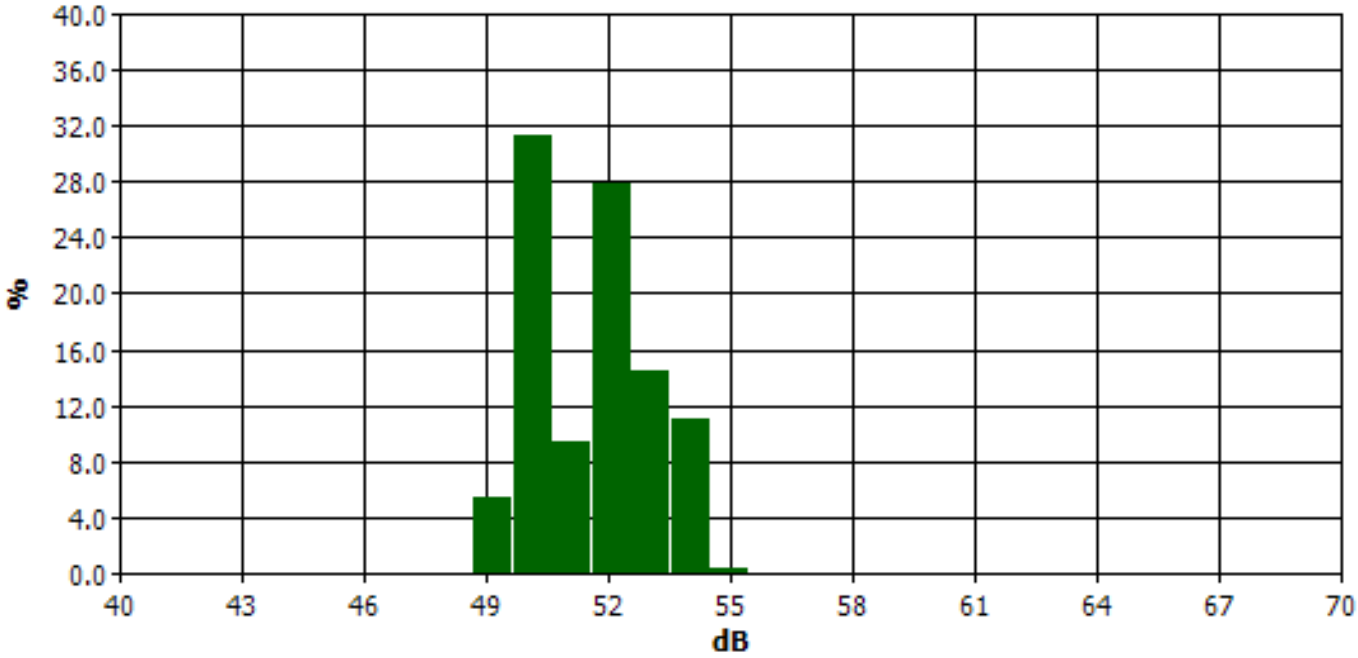
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK/EV103 - 792 / 2020
Location	N9 - Night time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Thursday, December 17, 2020 21:00:00
Stop Time	Thursday, December 17, 2020 22:00:00
User Name	JS / MB
Comments	Domestic animals , insects , genset , human activities .

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	52.1 dB	Dose	1	0 %
Lmin	1	48.9 dB	Lmax	1	64.1 dB
Lpk	1	78.2 dB	TWA	1	43.1 dB
L1	1	54.6 dB	L10	1	54 dB
L50	1	52.1 dB	L90	1	50 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



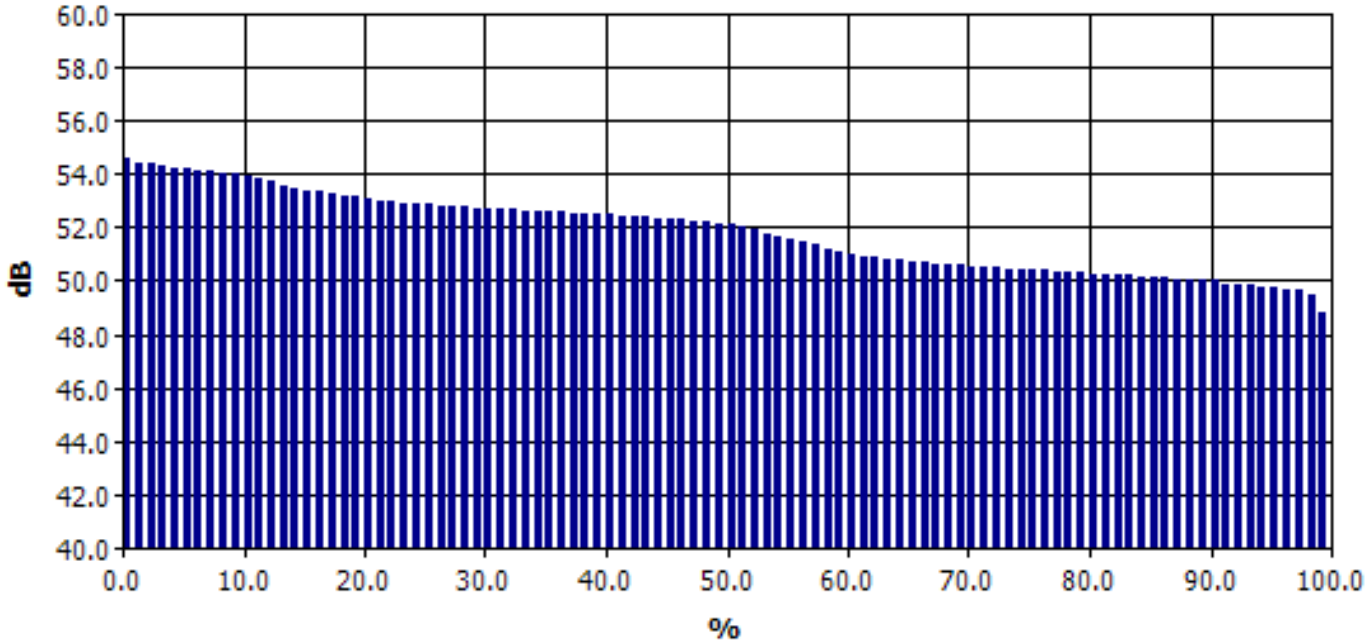
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
46.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
47.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49.0	0.0	0.0	0.0	0.1	0.2	0.3	0.5	0.9	1.3	2.1	5.4
50.0	3.0	4.0	2.7	4.0	3.9	3.7	3.2	2.7	2.3	1.8	31.2
51.0	1.4	1.1	1.0	0.9	0.8	0.7	0.7	0.8	0.9	1.1	9.5
52.0	1.3	1.5	1.8	2.1	2.5	3.3	3.9	4.1	4.0	3.3	27.8
53.0	2.6	2.2	1.2	1.6	1.5	1.2	1.1	1.0	1.0	1.1	14.5
54.0	1.5	1.8	1.9	1.8	1.5	1.1	0.7	0.4	0.2	0.2	11.1
55.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		54.6	54.4	54.4	54.3	54.2	54.2	54.1	54.1	54.0
10%	54.0	53.9	53.8	53.7	53.6	53.5	53.4	53.4	53.3	53.2
20%	53.2	53.1	53.0	53.0	52.9	52.9	52.9	52.8	52.8	52.8
30%	52.7	52.7	52.7	52.7	52.6	52.6	52.6	52.6	52.5	52.5
40%	52.5	52.5	52.4	52.4	52.4	52.3	52.3	52.3	52.2	52.2
50%	52.1	52.1	52.0	51.9	51.8	51.7	51.6	51.5	51.4	51.2
60%	51.1	51.0	50.9	50.9	50.8	50.8	50.7	50.7	50.6	50.6
70%	50.6	50.5	50.5	50.5	50.4	50.4	50.4	50.4	50.3	50.3
80%	50.3	50.2	50.2	50.2	50.2	50.1	50.1	50.1	50.0	50.0
90%	50.0	50.0	49.9	49.9	49.9	49.8	49.8	49.7	49.7	49.5
100%	48.8									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/17/2020 9:01:00 PM	53.0	67.4	54.2	51.9	53.6	52.5
12/17/2020 9:02:00 PM	53.2	67.9	54.4	51.8	53.8	52.6
12/17/2020 9:03:00 PM	54.1	69.0	55.8	52.0	55.1	53.0
12/17/2020 9:04:00 PM	54.2	68.8	55.5	52.9	54.9	53.6
12/17/2020 9:05:00 PM	52.9	68.1	54.0	52.2	53.4	52.7
12/17/2020 9:06:00 PM	52.5	71.3	54.7	50.1	53.2	51.0
12/17/2020 9:07:00 PM	50.6	66.4	52.3	49.6	51.1	50.3
12/17/2020 9:08:00 PM	50.6	65.2	52.2	49.7	51.2	50.2
12/17/2020 9:09:00 PM	50.2	64.7	52.1	49.3	50.7	49.9
12/17/2020 9:10:00 PM	50.3	65.5	54.1	49.3	50.8	50.0
12/17/2020 9:11:00 PM	50.2	64.6	51.4	49.3	50.7	49.9
12/17/2020	50.2	64.6	51.4	49.2	50.7	49.9

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/17/2020 9:13:00 PM	50.3	65.1	51.6	49.4	50.8	50.0
12/17/2020 9:14:00 PM	51.4	74.0	64.1	49.4	51.1	50.0
12/17/2020 9:15:00 PM	50.7	68.4	55.8	49.7	51.2	50.1
12/17/2020 9:16:00 PM	50.4	64.8	51.6	49.4	50.9	50.2
12/17/2020 9:17:00 PM	50.5	65.2	51.8	49.6	51.0	50.2
12/17/2020 9:18:00 PM	50.6	65.3	52.5	49.9	51.1	50.3
12/17/2020 9:19:00 PM	50.5	65.6	51.6	49.7	50.9	50.2
12/17/2020 9:20:00 PM	50.3	68.4	51.3	49.3	50.8	50.0
12/17/2020 9:21:00 PM	50.5	67.5	54.2	49.5	51.1	50.1
12/17/2020 9:22:00 PM	51.1	66.4	52.4	49.7	51.9	50.5
12/17/2020 9:23:00 PM	52.2	69.4	55.1	50.9	52.7	51.8
12/17/2020 9:24:00 PM	52.6	67.3	53.3	51.6	53.0	52.4
12/17/2020 9:25:00 PM	53.0	68.6	53.8	52.3	53.4	52.8
12/17/2020 9:26:00 PM	53.4	68.7	56.0	52.7	53.9	53.1
12/17/2020 9:27:00 PM	53.7	70.7	55.7	52.8	54.2	53.3
12/17/2020 9:28:00 PM	53.9	68.9	55.0	52.7	54.4	53.4
12/17/2020 9:29:00 PM	53.9	68.2	55.0	52.5	54.6	53.2
12/17/2020 9:30:00 PM	53.9	68.8	54.8	51.6	54.5	53.2
12/17/2020 9:31:00 PM	54.2	69.2	55.2	52.9	54.6	54.1
12/17/2020 9:32:00 PM	54.4	68.7	55.1	53.6	54.8	54.2
12/17/2020 9:33:00 PM	54.3	68.9	56.2	53.7	54.6	54.1
12/17/2020 9:34:00 PM	54.1	68.5	54.8	52.8	54.5	53.9
12/17/2020 9:35:00 PM	53.4	78.2	56.6	51.2	54.2	52.6
12/17/2020 9:36:00 PM	52.7	67.3	54.1	51.9	53.0	52.5
12/17/2020 9:37:00 PM	52.9	68.1	55.5	52.2	53.2	52.7
12/17/2020 9:38:00 PM	52.8	73.0	54.7	52.2	53.1	52.6
12/17/2020 9:39:00 PM	52.7	70.3	53.6	52.2	53.1	52.6
12/17/2020 9:40:00 PM	52.8	67.7	53.9	52.2	53.2	52.7
12/17/2020 9:41:00 PM	52.9	68.6	56.4	52.0	53.4	52.6
12/17/2020 9:42:00 PM	52.3	67.6	53.5	50.5	53.1	51.2
12/17/2020 9:43:00 PM	52.7	68.5	53.5	52.0	53.1	52.5
12/17/2020 9:44:00 PM	51.9	67.5	53.1	49.5	52.9	50.2
12/17/2020 9:45:00 PM	50.3	64.9	51.3	49.6	50.7	50.0
12/17/2020 9:46:00 PM	50.0	69.8	52.5	49.2	50.6	49.7
12/17/2020 9:47:00 PM	50.1	64.6	51.3	49.1	50.6	49.8
12/17/2020 9:48:00 PM	50.2	64.9	51.3	49.2	50.7	49.8
12/17/2020 9:49:00 PM	50.5	66.9	51.9	49.1	51.0	50.1
12/17/2020 9:50:00 PM	50.9	65.7	53.4	50.0	51.5	50.6
12/17/2020	51.2	66.1	52.7	50.1	51.9	50.8

Logged Data Table (cont'd)

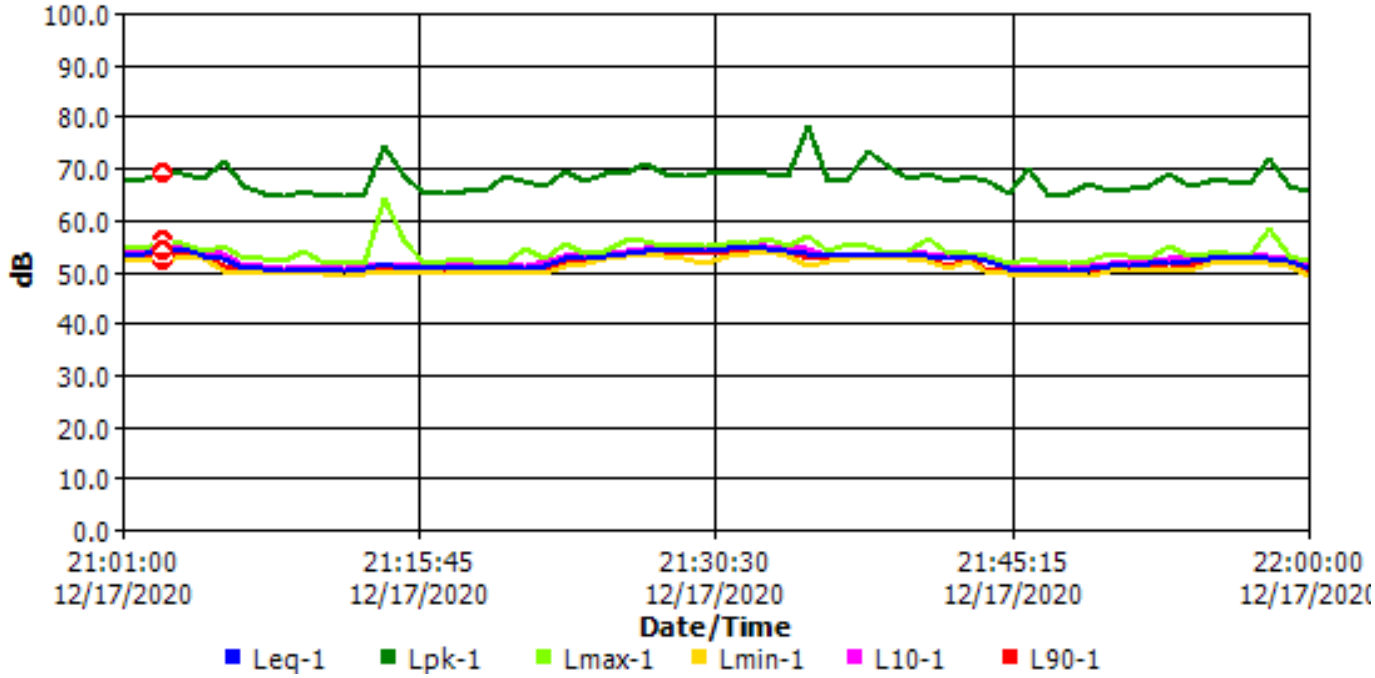
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/17/2020 9:52:00 PM	51.5	66.3	52.5	50.4	52.1	51.0
12/17/2020 9:53:00 PM	51.5	68.9	54.8	49.9	52.2	50.6
12/17/2020 9:54:00 PM	51.9	66.3	53.0	50.1	52.6	50.9
12/17/2020 9:55:00 PM	52.4	67.3	53.4	51.6	52.9	52.2
12/17/2020 9:56:00 PM	52.5	67.4	53.3	51.6	52.9	52.3
12/17/2020 9:57:00 PM	52.3	66.7	53.0	51.6	52.7	52.1
12/17/2020 9:58:00 PM	52.5	71.7	58.3	51.5	52.8	52.0
12/17/2020 9:59:00 PM	51.9	66.6	53.0	51.1	52.4	51.7
12/17/2020 10:00:00 PM	50.4	65.6	52.0	48.9	51.6	49.5

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	78.2 dB
Lmax	1	64.1 dB	Lmin	1	48.9 dB
Leq	1	52.1 dB	TWA	1	43.1 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

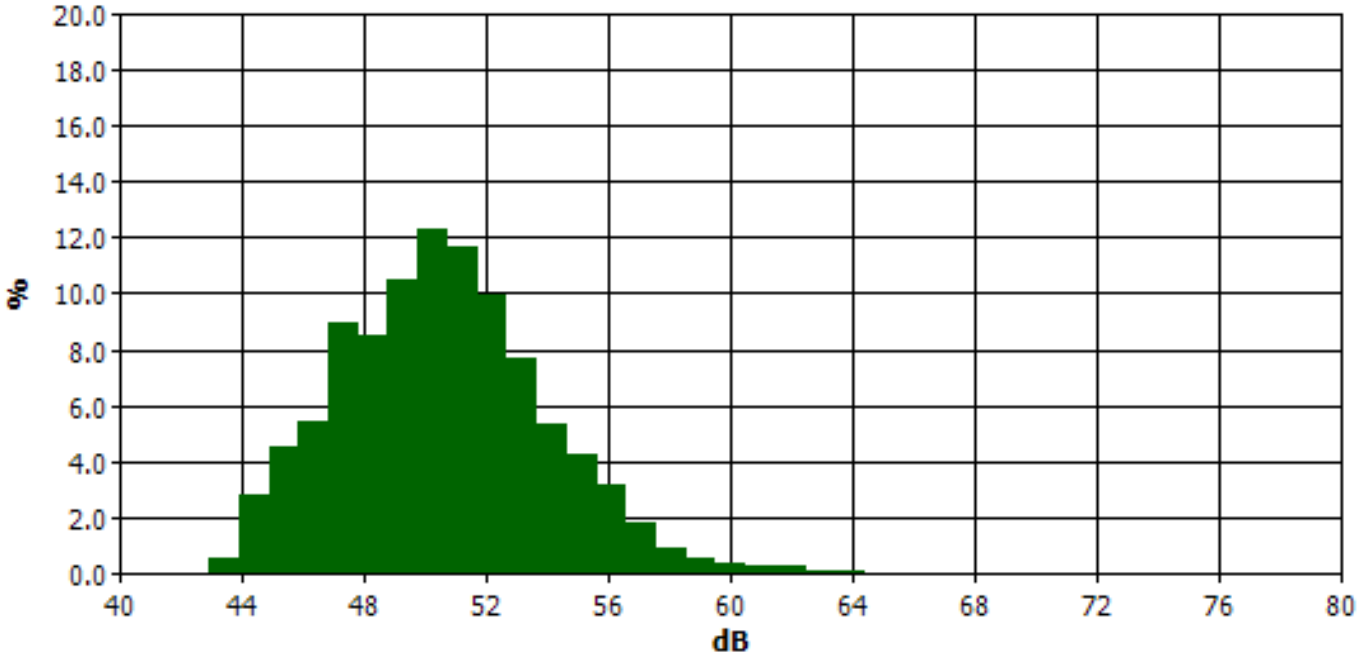
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CKEV103 - 792 /2020
Location	N10 - Day time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Wednesday, December 16, 2020 13:00:00
Stop Time	Wednesday, December 16, 2020 14:00:00
User Name	JS / MB
Comments	Human activities , boat movement ,vehicles movement , domestic animals.

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	52.4 dB	Dose	1	0 %
Lmin	1	43.1 dB	Lmax	1	73.1 dB
Lpk	1	89.2 dB	TWA	1	43.3 dB
L1	1	60.1 dB	L10	1	55.3 dB
L50	1	50.6 dB	L90	1	46.3 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



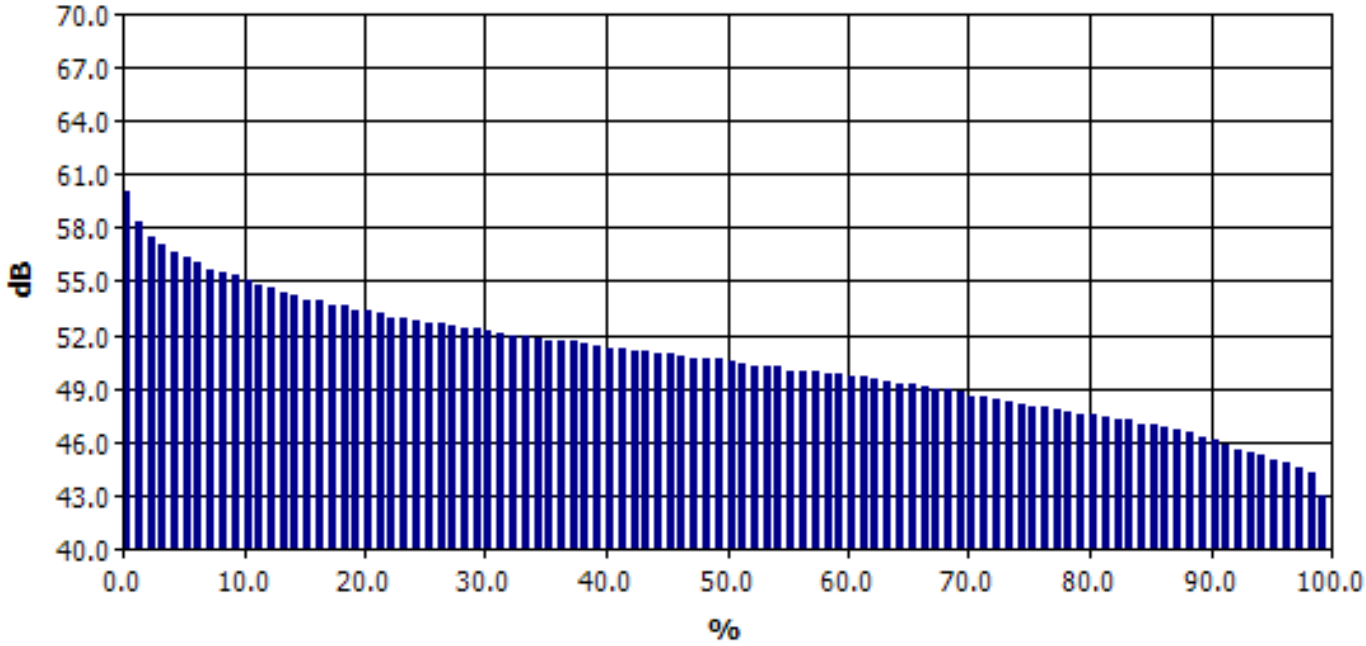
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.5
44.0	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.5	2.8
45.0	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.6
46.0	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.8	5.4
47.0	0.8	0.9	0.5	0.7	0.8	0.9	1.0	1.1	1.0	1.0	8.9
48.0	1.0	1.0	0.9	0.9	0.8	0.7	0.8	0.7	0.8	0.8	8.5
49.0	0.8	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.2	1.3	10.5
50.0	1.4	1.5	0.9	1.2	1.2	1.3	1.2	1.2	1.3	1.2	12.3
51.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	11.7
52.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0	10.0
53.0	1.0	1.0	0.6	0.8	0.8	0.8	0.7	0.7	0.7	0.7	7.7
54.0	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5.3
55.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.3
56.0	0.5	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.2	3.2
57.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	1.8
58.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
59.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.6
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		60.1	58.4	57.5	57.0	56.6	56.3	56.0	55.7	55.5
10%	55.3	55.0	54.8	54.6	54.4	54.2	54.0	53.9	53.7	53.6
20%	53.4	53.3	53.2	53.0	52.9	52.8	52.7	52.6	52.5	52.4
30%	52.3	52.2	52.1	52.0	51.9	51.8	51.7	51.7	51.6	51.5
40%	51.4	51.3	51.2	51.1	51.1	51.0	50.9	50.8	50.7	50.6
50%	50.6	50.5	50.4	50.3	50.2	50.2	50.0	50.0	49.9	49.8
60%	49.8	49.7	49.6	49.5	49.4	49.3	49.2	49.1	49.0	48.9
70%	48.8	48.6	48.5	48.4	48.2	48.1	48.0	47.9	47.8	47.7
80%	47.6	47.5	47.4	47.3	47.2	47.0	46.9	46.8	46.7	46.5
90%	46.3	46.1	45.9	45.6	45.4	45.2	45.0	44.8	44.6	44.2
100%	43.0									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/16/2020 1:01:00 PM	49.2	73.5	59.7	43.4	51.4	45.3
12/16/2020 1:02:00 PM	48.4	75.8	61.4	43.1	51.4	43.9
12/16/2020 1:03:00 PM	46.5	76.0	61.0	43.5	47.3	44.0
12/16/2020 1:04:00 PM	53.4	89.2	73.1	44.4	52.9	45.2
12/16/2020 1:05:00 PM	49.6	79.5	63.9	44.2	51.8	44.9
12/16/2020 1:06:00 PM	51.2	77.2	65.3	44.1	51.7	45.0
12/16/2020 1:07:00 PM	53.8	85.5	72.0	45.1	53.8	45.8
12/16/2020	55.2	79.5	63.5	47.0	58.8	48.3

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/16/2020 1:09:00 PM	49.3	76.1	59.6	45.4	51.4	46.7
12/16/2020 1:10:00 PM	51.5	70.4	57.0	47.7	54.2	48.8
12/16/2020 1:11:00 PM	49.7	76.0	61.4	47.5	50.5	48.2
12/16/2020 1:12:00 PM	52.1	74.7	59.7	48.1	53.8	49.5
12/16/2020 1:13:00 PM	52.4	77.7	63.3	48.3	53.9	49.5
12/16/2020 1:14:00 PM	53.5	77.7	62.4	49.6	55.5	50.8
12/16/2020 1:15:00 PM	55.7	79.7	63.8	49.7	57.5	52.3
12/16/2020 1:16:00 PM	51.5	72.2	58.4	47.8	54.0	49.0
12/16/2020 1:17:00 PM	50.7	66.6	52.6	48.9	51.6	49.6
12/16/2020 1:18:00 PM	51.3	80.6	63.1	48.5	52.2	49.3
12/16/2020 1:19:00 PM	51.0	79.2	61.6	49.3	51.9	50.1
12/16/2020 1:20:00 PM	51.3	68.2	54.6	49.4	52.4	50.3
12/16/2020 1:21:00 PM	51.6	68.2	54.5	48.8	53.1	50.1
12/16/2020 1:22:00 PM	51.8	79.2	62.5	49.1	53.2	50.1
12/16/2020 1:23:00 PM	53.9	74.0	62.5	48.0	56.0	50.7
12/16/2020 1:24:00 PM	53.1	71.2	57.1	50.1	54.6	51.5
12/16/2020 1:25:00 PM	52.9	79.5	64.0	49.2	54.2	50.2
12/16/2020 1:26:00 PM	53.3	79.6	64.1	48.4	54.7	50.0
12/16/2020 1:27:00 PM	52.2	80.0	64.1	48.5	53.0	50.0
12/16/2020 1:28:00 PM	52.9	79.2	64.5	49.7	54.3	50.9
12/16/2020 1:29:00 PM	53.7	73.7	60.1	48.5	55.7	51.0
12/16/2020 1:30:00 PM	53.3	72.8	58.5	48.6	55.4	50.3
12/16/2020 1:31:00 PM	54.4	76.0	58.7	49.0	57.1	50.8
12/16/2020 1:32:00 PM	52.6	75.1	59.5	47.7	54.9	49.6
12/16/2020 1:33:00 PM	52.5	74.1	58.9	48.5	54.3	50.1
12/16/2020 1:34:00 PM	50.8	73.2	57.9	47.5	52.3	48.9
12/16/2020 1:35:00 PM	50.9	73.7	58.9	48.2	51.9	49.4
12/16/2020 1:36:00 PM	52.2	72.8	57.9	48.4	53.5	50.5
12/16/2020 1:37:00 PM	55.6	82.3	66.8	48.9	57.6	51.3
12/16/2020 1:38:00 PM	57.5	81.4	67.9	50.5	59.9	53.1
12/16/2020 1:39:00 PM	58.8	77.1	64.9	50.9	62.3	53.3
12/16/2020 1:40:00 PM	54.6	73.4	60.4	47.8	57.0	50.6
12/16/2020 1:41:00 PM	52.8	68.1	56.6	47.3	54.9	48.3
12/16/2020 1:42:00 PM	47.5	72.5	56.4	45.8	48.1	46.9
12/16/2020 1:43:00 PM	47.1	71.2	55.9	45.8	47.9	46.5
12/16/2020 1:44:00 PM	48.1	68.7	55.1	46.0	49.6	46.8
12/16/2020 1:45:00 PM	49.4	78.8	66.5	46.8	49.8	47.6
12/16/2020 1:46:00 PM	48.5	70.3	55.2	46.7	49.7	47.6
12/16/2020	47.5	64.8	52.0	45.7	48.8	46.5

Logged Data Table (cont'd)

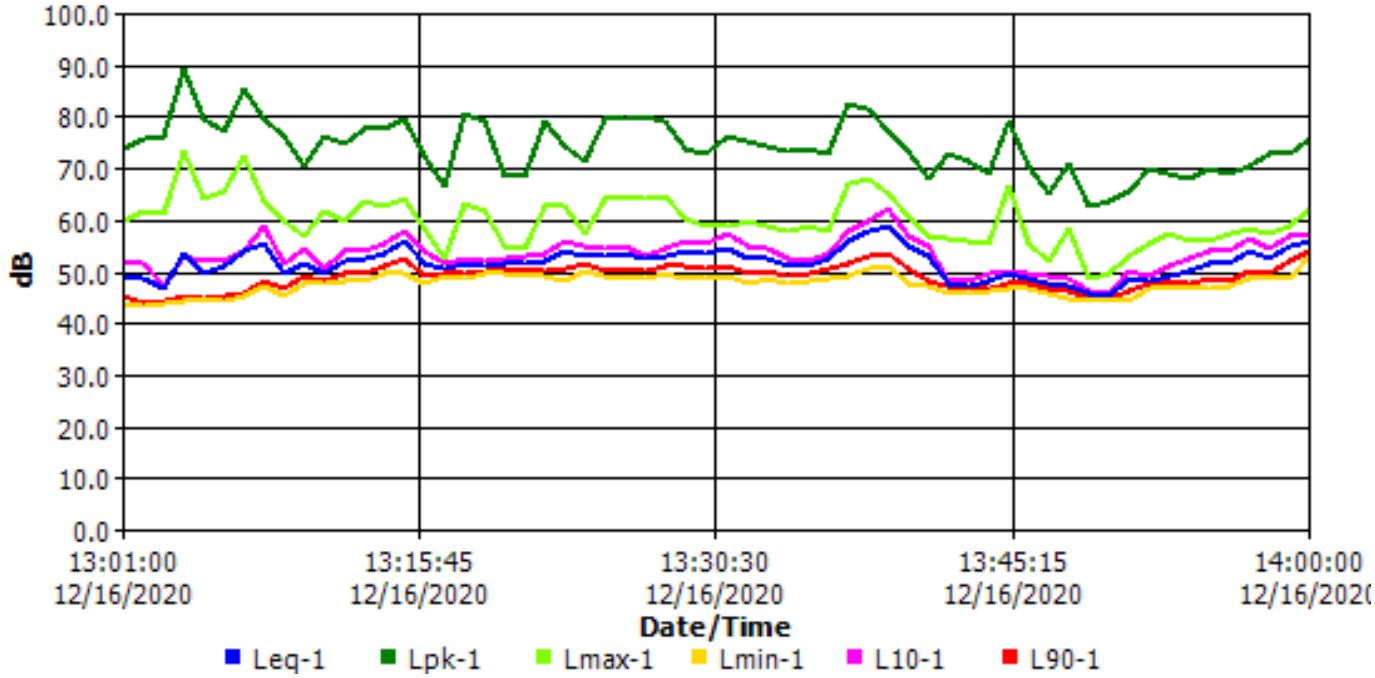
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/16/2020 1:48:00 PM	47.3	70.8	58.1	44.8	48.5	45.9
12/16/2020 1:49:00 PM	45.5	62.8	48.4	44.2	46.1	44.9
12/16/2020 1:50:00 PM	45.2	63.7	49.7	44.0	45.7	44.7
12/16/2020 1:51:00 PM	48.4	65.3	52.9	44.2	49.9	46.0
12/16/2020 1:52:00 PM	48.3	69.9	55.2	46.7	49.2	47.6
12/16/2020 1:53:00 PM	49.1	68.9	57.4	46.9	50.9	47.7
12/16/2020 1:54:00 PM	50.0	67.8	55.9	46.4	52.3	47.7
12/16/2020 1:55:00 PM	51.5	69.7	55.8	46.7	53.9	48.4
12/16/2020 1:56:00 PM	51.3	69.0	57.1	47.3	53.8	48.3
12/16/2020 1:57:00 PM	53.9	70.5	58.2	48.7	56.2	50.2
12/16/2020 1:58:00 PM	52.3	72.6	57.4	48.4	54.2	49.6
12/16/2020 1:59:00 PM	55.0	72.8	58.6	48.6	56.9	51.7
12/16/2020 2:00:00 PM	55.7	75.7	61.9	52.8	56.8	53.9

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	89.2 dB
Lmax	1	73.1 dB	Lmin	1	43.1 dB
Leq	1	52.4 dB	TWA	1	43.3 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Session Report

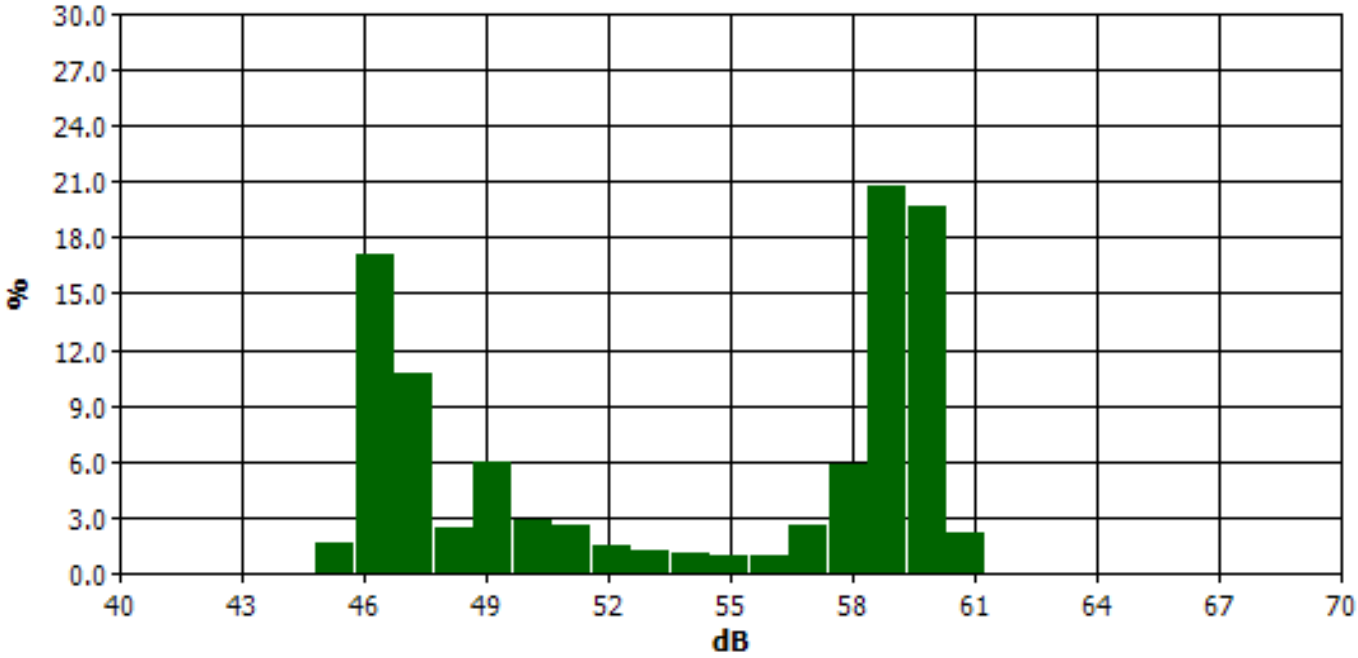
Information Panel

Company Name	Sarawak Energy Bhd.
Description	CK/EV103- 792 / 2020
Location	N10 - Night time
Device Model Type	SoundPro DL
Device Serial Number	BJK090002
Start Time	Wednesday, December 16, 2020 21:00:00
Stop Time	Wednesday, December 16, 2020 22:00:00
User Name	JS / MB
Comments	Human activities , domestic animals , insects , vessel .

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	57.2 dB	Dose	1	0 %
Lmin	1	44.8 dB	Lmax	1	64.5 dB
Lpk	1	92.9 dB	TWA	1	48.2 dB
L1	1	61.1 dB	L10	1	60.3 dB
L50	1	57.4 dB	L90	1	46.5 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF

Statistics Chart



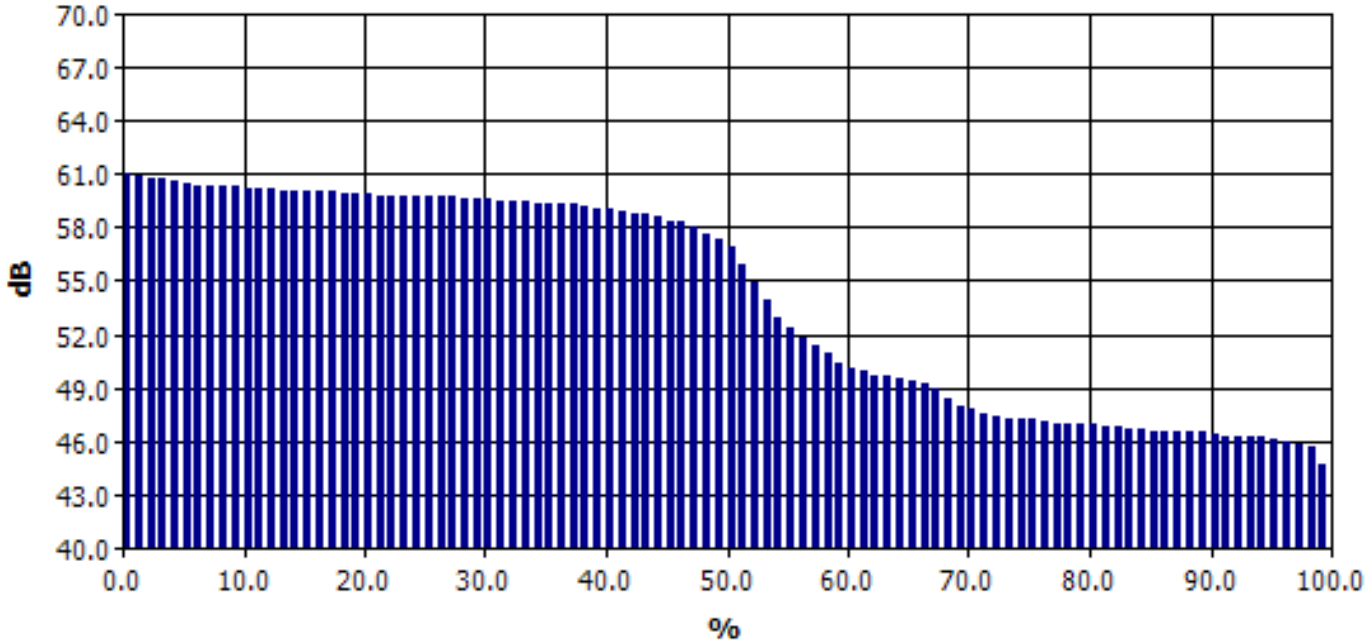
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.4	0.6	1.6
46.0	0.8	1.0	1.2	1.6	1.8	1.9	2.1	2.2	2.3	2.2	17.1
47.0	2.0	1.8	1.0	1.4	1.1	0.9	0.7	0.6	0.5	0.5	10.7
48.0	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.5
49.0	0.3	0.3	0.4	0.5	0.6	0.8	0.8	0.8	0.8	0.7	5.9
50.0	0.6	0.5	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	2.9
51.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	2.5
52.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	1.5
53.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
54.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
55.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
56.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
57.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	2.5
58.0	0.3	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.8	0.9	5.9

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
59.0	1.0	1.1	0.9	1.5	1.9	2.2	2.6	3.0	3.3	3.3	20.8
60.0	3.1	2.9	2.7	2.5	2.2	1.9	1.5	1.2	1.0	0.9	19.7
61.0	0.7	0.5	0.4	0.2	0.2	0.1	0.1	0.0	0.0	0.0	2.2
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		61.1	60.9	60.8	60.7	60.6	60.5	60.4	60.4	60.3
10%	60.3	60.2	60.2	60.2	60.1	60.1	60.0	60.0	60.0	59.9
20%	59.9	59.9	59.8	59.8	59.8	59.8	59.7	59.7	59.7	59.6
30%	59.6	59.6	59.5	59.5	59.5	59.4	59.4	59.3	59.3	59.2
40%	59.1	59.0	58.9	58.8	58.7	58.6	58.4	58.3	58.1	57.7
50%	57.4	56.9	55.9	54.9	53.9	53.0	52.3	51.8	51.4	51.0
60%	50.4	50.1	49.9	49.7	49.6	49.5	49.4	49.2	48.9	48.4
70%	48.0	47.8	47.6	47.4	47.3	47.2	47.2	47.1	47.0	47.0
80%	46.9	46.9	46.8	46.8	46.7	46.7	46.6	46.6	46.5	46.5
90%	46.5	46.4	46.3	46.3	46.2	46.2	46.1	46.0	45.9	45.7
100%	44.7									

Logged Data Table

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/16/2020 9:01:00 PM	47.1	64.4	51.3	45.4	48.2	46.2
12/16/2020 9:02:00 PM	48.1	71.6	57.4	45.2	49.7	46.2
12/16/2020 9:03:00 PM	46.8	61.7	48.6	45.5	47.6	46.3
12/16/2020 9:04:00 PM	46.7	62.8	48.5	45.2	47.6	46.1
12/16/2020 9:05:00 PM	46.7	62.7	48.0	45.3	47.4	46.3
12/16/2020 9:06:00 PM	46.7	62.1	48.3	45.6	47.3	46.3
12/16/2020 9:07:00 PM	47.0	66.6	52.1	45.6	47.7	46.4
12/16/2020 9:08:00 PM	47.0	62.6	48.8	45.3	47.8	46.4
12/16/2020 9:09:00 PM	46.8	61.8	48.6	45.7	47.4	46.3
12/16/2020 9:10:00 PM	46.8	65.2	48.4	45.8	47.4	46.4
12/16/2020 9:11:00 PM	46.9	62.1	48.4	45.8	47.6	46.5
12/16/2020	47.3	67.4	50.5	45.3	48.9	46.2

Logged Data Table (cont'd)

Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/16/2020 9:13:00 PM	46.7	64.8	49.6	45.3	47.6	46.1
12/16/2020 9:14:00 PM	46.6	61.6	48.6	45.1	47.4	46.0
12/16/2020 9:15:00 PM	46.4	62.3	48.6	45.0	47.2	45.8
12/16/2020 9:16:00 PM	46.8	65.4	49.2	44.8	47.7	46.1
12/16/2020 9:17:00 PM	47.3	72.5	52.6	45.8	48.2	46.7
12/16/2020 9:18:00 PM	47.2	68.7	51.4	45.7	48.0	46.5
12/16/2020 9:19:00 PM	47.8	77.6	50.8	46.2	48.7	47.1
12/16/2020 9:20:00 PM	49.1	84.4	56.4	47.3	49.8	48.4
12/16/2020 9:21:00 PM	49.7	76.2	51.8	48.7	50.3	49.3
12/16/2020 9:22:00 PM	49.7	73.9	51.3	48.8	50.2	49.4
12/16/2020 9:23:00 PM	49.8	77.3	52.7	48.8	50.4	49.5
12/16/2020 9:24:00 PM	50.0	78.8	53.0	48.9	50.5	49.6
12/16/2020 9:25:00 PM	51.0	79.6	53.4	49.5	51.7	50.3
12/16/2020 9:26:00 PM	51.6	77.4	53.3	50.8	52.1	51.3
12/16/2020 9:27:00 PM	52.5	81.8	57.3	51.3	53.1	52.0
12/16/2020 9:28:00 PM	53.9	78.3	55.4	52.5	54.6	53.2
12/16/2020 9:29:00 PM	55.6	82.4	60.1	54.2	56.4	54.9
12/16/2020 9:30:00 PM	57.1	86.8	62.3	55.9	57.6	56.7
12/16/2020 9:31:00 PM	57.7	84.8	59.3	56.9	58.2	57.5
12/16/2020 9:32:00 PM	58.3	84.9	60.7	57.5	58.7	58.1
12/16/2020 9:33:00 PM	58.6	87.3	61.1	57.9	59.0	58.4
12/16/2020 9:34:00 PM	58.9	84.9	61.6	58.1	59.2	58.7
12/16/2020 9:35:00 PM	59.3	92.5	64.5	58.4	59.8	58.9
12/16/2020 9:36:00 PM	60.1	84.1	61.5	59.0	60.5	59.7
12/16/2020 9:37:00 PM	60.5	87.4	62.9	59.8	60.9	60.3
12/16/2020 9:38:00 PM	60.2	84.8	61.9	59.4	60.7	60.0
12/16/2020 9:39:00 PM	59.8	82.1	61.5	59.1	60.2	59.6
12/16/2020 9:40:00 PM	59.9	85.1	62.4	59.1	60.3	59.7
12/16/2020 9:41:00 PM	60.0	90.4	63.1	59.3	60.4	59.8
12/16/2020 9:42:00 PM	59.8	84.1	62.2	58.9	60.2	59.5
12/16/2020 9:43:00 PM	59.5	82.6	60.4	58.8	59.8	59.3
12/16/2020 9:44:00 PM	59.4	85.1	61.3	58.7	59.8	59.2
12/16/2020 9:45:00 PM	59.6	84.7	60.5	58.9	60.0	59.4
12/16/2020 9:46:00 PM	60.1	90.7	62.6	59.3	60.6	59.8
12/16/2020 9:47:00 PM	60.4	86.5	63.2	59.8	60.8	60.2
12/16/2020 9:48:00 PM	60.4	84.1	62.7	59.6	60.8	60.2
12/16/2020 9:49:00 PM	60.1	85.6	62.5	59.5	60.5	59.9
12/16/2020 9:50:00 PM	60.1	86.0	62.0	59.5	60.4	59.9
12/16/2020	59.9	83.5	61.3	59.2	60.3	59.7

Logged Data Table (cont'd)

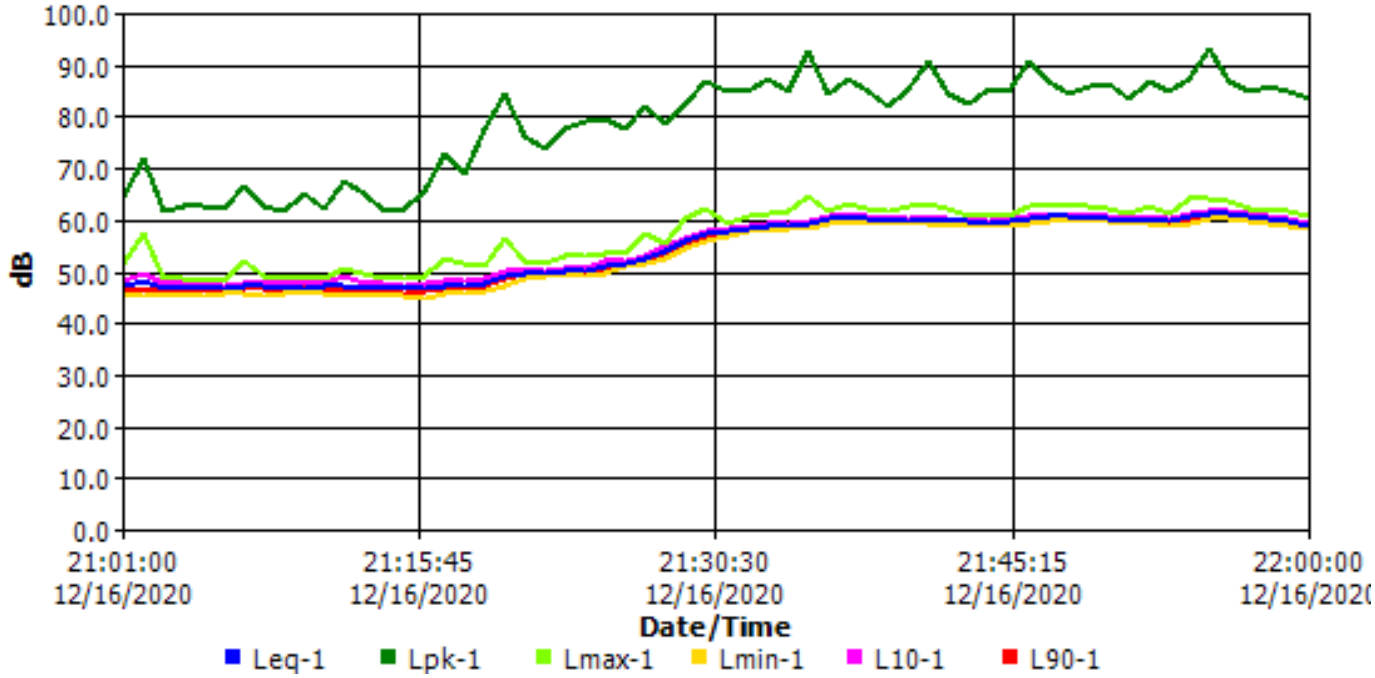
Timestamp	Leq-1	Lpk-1	Lmax-1	Lmin-1	L10-1	L90-1
12/16/2020 9:52:00 PM	59.7	86.5	62.5	59.0	60.2	59.5
12/16/2020 9:53:00 PM	59.6	84.8	61.3	58.9	60.0	59.4
12/16/2020 9:54:00 PM	60.4	87.2	64.0	59.4	60.9	60.0
12/16/2020 9:55:00 PM	61.0	92.9	64.0	60.3	61.4	60.8
12/16/2020 9:56:00 PM	61.0	86.6	63.3	60.2	61.4	60.7
12/16/2020 9:57:00 PM	60.6	84.8	62.2	59.9	61.0	60.4
12/16/2020 9:58:00 PM	60.1	85.7	61.7	59.3	60.6	59.9
12/16/2020 9:59:00 PM	59.6	84.6	61.5	58.7	60.0	59.2
12/16/2020 10:00:00 PM	58.9	83.2	60.5	58.2	59.4	58.7

Study Report

General Data Panel

Description	Meter	Value	Description	Meter	Value
Dose	1	0 %	Lpk	1	92.9 dB
Lmax	1	64.5 dB	Lmin	1	44.8 dB
Leq	1	57.2 dB	TWA	1	48.2 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	1	3 dB
Int Threshold	1	80 dB	Log Rate	1	60 s

Logged Data Chart



Appendix 5.10.2

DOE Noise Guideline 1st Schedule, 2019 (3rd Ed)

Guidelines for Environmental Noise Limits and Control

Third Edition

DEPARTMENT OF ENVIRONMENT
MINISTRY OF ENERGY, SCIENCE, TECHNOLOGY,
ENVIRONMENT & CLIMATE CHANGE (MESTECC)

SCHEDULE OF PERMISIBLE SOUND LEVELS

FIRST SCHEDULE

RECOMMENDED PERMISSIBLE SOUND LEVEL (L_{Aeq}) BY RECEIVING LAND USE FOR NEW DEVELOPMENT

Receiving Land Use Category	L_{Aeq} Day 7.00 am - 10.00 pm	L_{Aeq} Night 10.00 pm - 7.00 am
Low Density Residential, Noise Sensitive Receptors, Institutional (School, Hospital, Worship).	55 dBA	50 dBA
Suburban Residential (Medium Density), Recreational	60 dBA	55 dBA
Urban Residential (High Density), Mixed Development	65 dBA	60 dBA
Commercial Business Zones.	65 dBA	60 dBA
Industrial Zones	70 dBA	65 dBA

Appendix 5.10.3

WHO Guideline for Community Noise

WHO GUIDELINES FOR COMMUNITY NOISE, 1999

Table 1: Guideline Values for Community Noise in Specific Environments

Specific environment	**Critical health effect(s)**	**L_{Aeq} [dB]**	**Time base [hours]**	**L_{Amax} fast [dB]**
Outdoor living area	Serious annoyance, daytime and evening Moderate annoyance, daytime and evening	55 50	16 16	- -
Dwelling, indoors Inside bedrooms	Speech intelligibility & moderate annoyance, daytime and evening Sleep disturbance, night-time	35 30	16 8	 45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60
School class rooms & pre-schools, indoors	Speech intelligibility, disturbance of information extraction, message communication	35	during class	-
Pre-school bedrooms, indoor	Sleep disturbance	30	sleeping -time	45
School, playground outdoor	Annoyance (external source)	55	during play	-
Hospital, ward rooms, indoors	Sleep disturbance, night-time Sleep disturbance, daytime and evenings	30 30	8 16	40 -
Hospitals, treatment rooms, indoors	Interference with rest and recovery	#1		
Industrial, commercial shopping and traffic areas, indoors and outdoors	Hearing impairment	70	24	110
Ceremonies, festivals and entertainment events	Hearing impairment (patrons:<5 times/year)	100	4	110
Public addresses, indoors and outdoors	Hearing impairment	85	1	110
Music and other sounds through headphones/ earphones	Hearing impairment (free-field value)	85 #4	1	110
Impulse sounds from toys, fireworks and firearms	Hearing impairment (adults) Hearing impairment (children)	- -	- -	140 #2 120 #2
Outdoors in parkland and conservations area	Disruption of tranquillity	#3		

#1: As low as possible

#2: Peak sound pressure (not LAF, max) measured 100 mm from the car.

#3: Existing quiet outdoor areas should be preserved and the ratio of intruding noise to natural background sound should be kept low.

#4: Under headphones, adapted to free-field values.